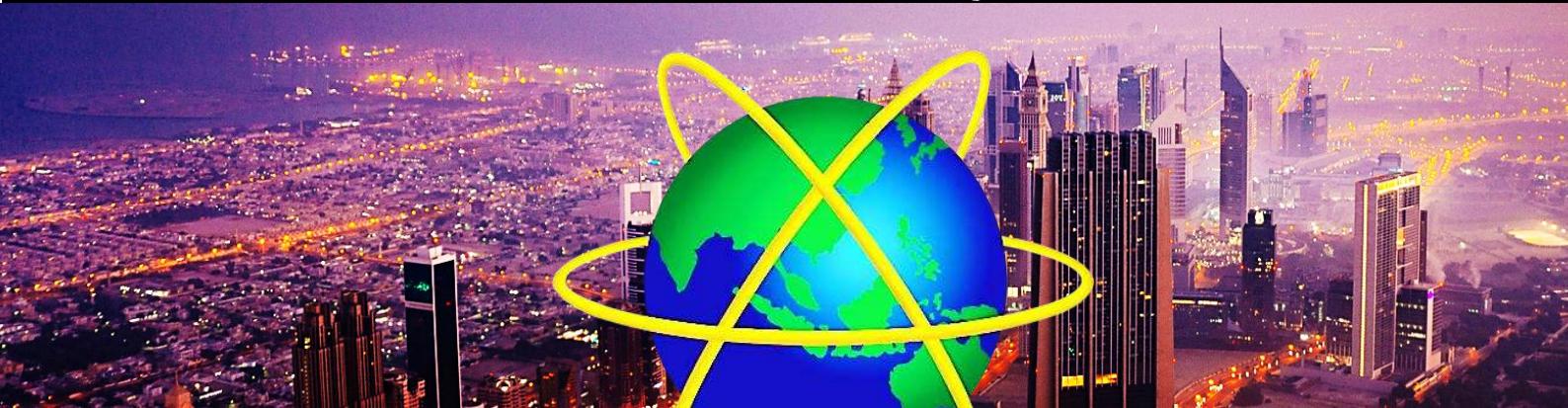
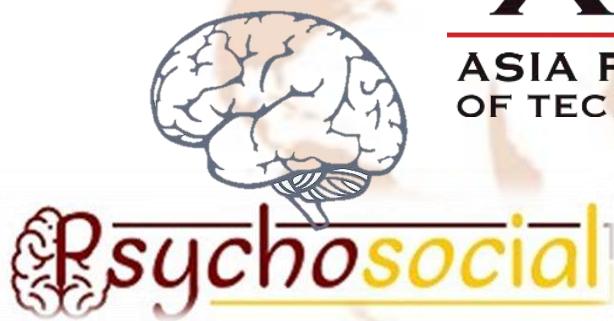


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ARTIFICIAL INTELLIGENCE AS A PARADOXICAL DIGITAL DISRUPTOR IN THE ACCOUNTING PROFESSION

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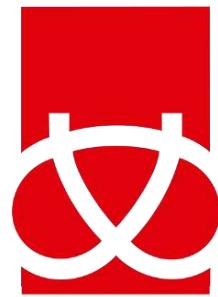
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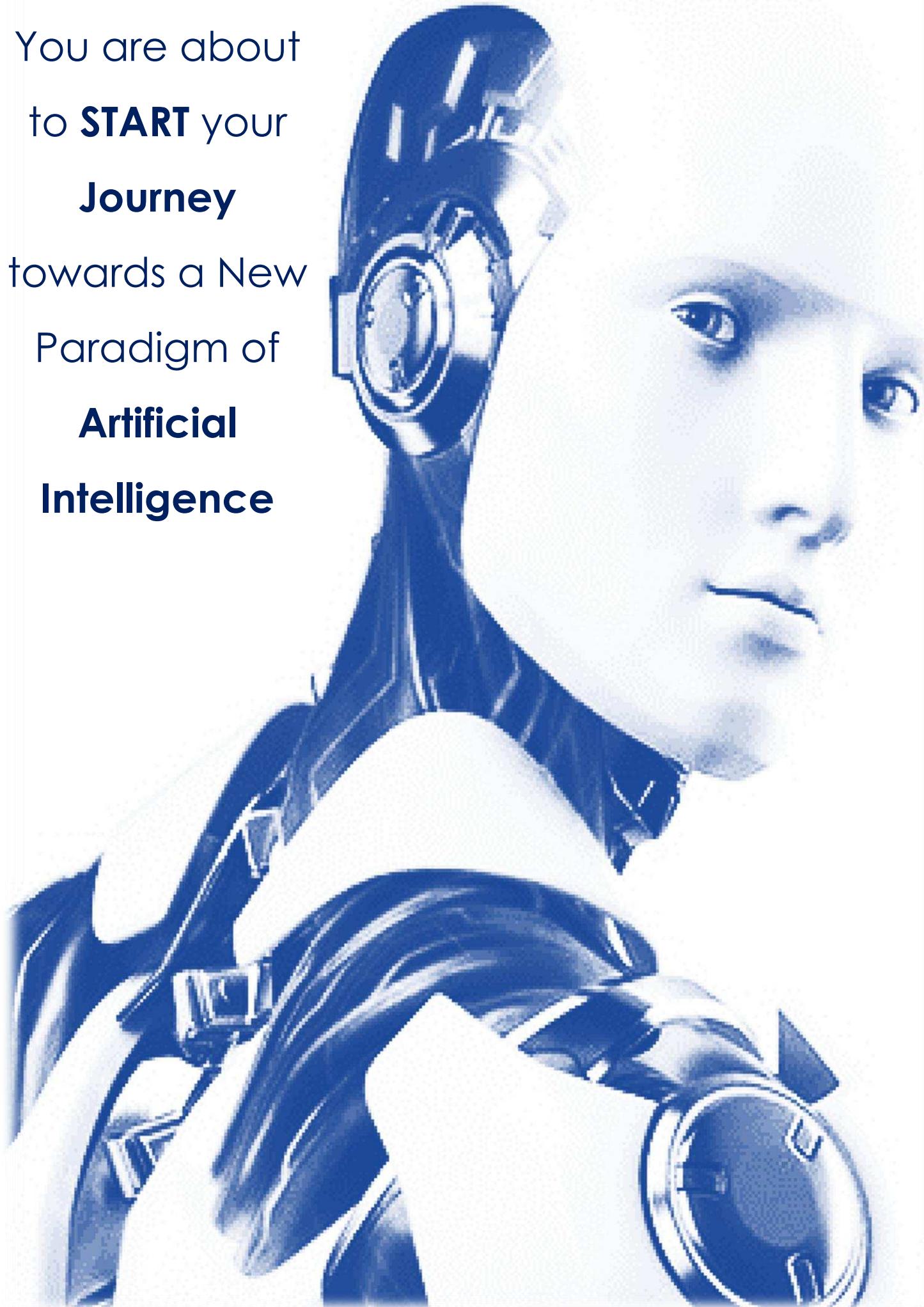
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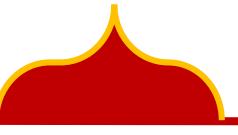
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Paradigm of
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Artificial Intelligence as a Paradoxical Digital Disruptor in the Accounting Profession

An Empirical Study amongst Accountants.



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*A*bstract

The nature of Industrial Revolution 4.0 reveals the secret regarding the waves of change that are appearing at unprecedented breath and scale due to the increasing potency of digital innovation. This is the crystallization of disruption addressed as the waves of digital disruption, driven by rapidly developed and continuously innovated digital technologies, such as, Artificial Intelligence. Thus, Artificial Intelligence as a Digital Disruptor interrupts the status quo, just like a megatrend in the ecosystem, thereby impacting businesses, companies, industries and professions. One of the major professions in sight is the Accounting Profession – which is observed to be impacted at a ‘paradox’. This is the ‘double impacting potential’ of Artificial Intelligence as Digital Disruptor – ‘creating opportunities’ but ‘igniting threats’, simultaneously. This is when it can complement or replace the profession completely – leaving the longevity of profession questionable. Thus, it is at this point where the research dwells into investigating how Artificial Intelligence creates opportunities and ignites threats in the profession, through twelve variables. Then the research turns around and looks at the tech embracing ability of the Accountants through six determinants, to investigate the level of positive and negative influence of Artificial Intelligence – thereby revealing the continuity status of the profession. In pursuance of carrying out this study, the researcher uses mixed methods to collect, present, analyze, and interpret data, in order to provide a complete understanding of the phenomenon studied.

Keywords: Artificial Intelligence, Digital Disruptor, Opportunity, Threats.

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*A*bbreviations

AP- Accounting Profession

AI- Artificial Intelligence

TEA – Tech-Embracing Abilities

MIA- Malaysian Institute of Accountants

CMA- Certified Management Accountants

CIMA- Chartered Institute of Management Accountants

ACCA- Association of Chartered Certified Accountants

EY- Ernst and Young

PWC- PricewaterhouseCoopers

IT- Information Technology

IV- Independent Variable

DV- Dependent Variable

IC- Intellectual Capital

<IR>- Integrated Reporting

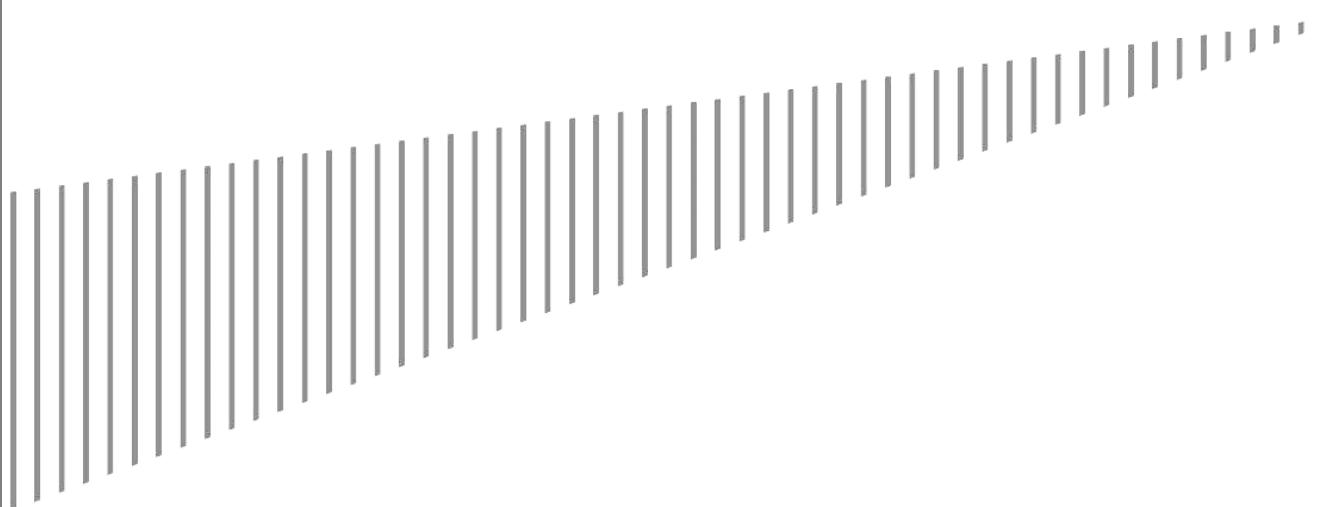
IIRC- International Integrated Reporting Council

IFAC – International Federation of Accountants



CHAPTER 1

INTRODUCTION



DOCUMENT FLOW

For this Section Only

1.0 Introduction – Setting the Tone

1.1 Research Background

1.2 Problem Identification

- Paradoxical Personality of AI on AP
- Intensity of Influence of AI on AP
- Changing or Replacing AP and Continuity Status of AP

1.3 Research Objectives

- General
- Specific

1.4 Research Questions

1.5 Research Hypotheses

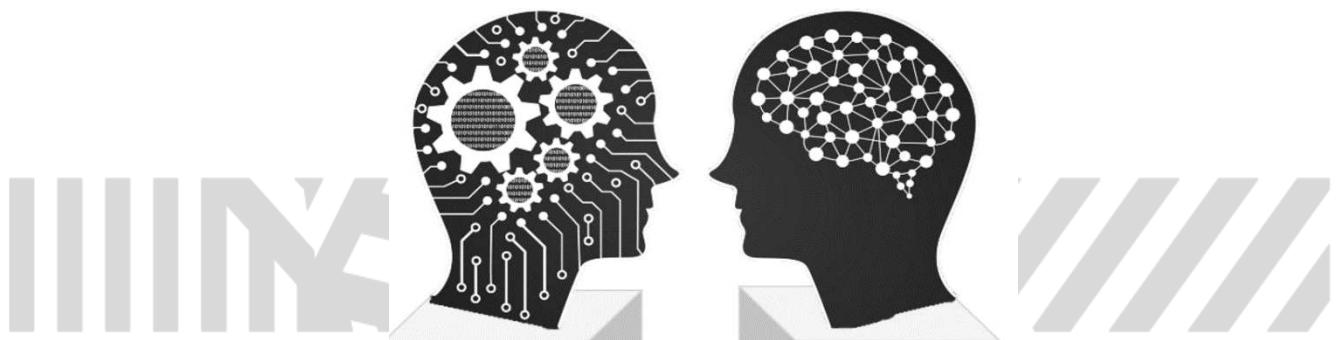
1.6 Mixed Methods Purpose Statement

1.7 Research Significance

- Theoretical
- Management and Accountant
- Academic

1.8 Research Scope

1.9 Research Limitations



1.0 Introduction

This chapter aims to dictate the foundations and general underlying concept of study in terms of its background; educational issue; objectives; logical research questions from gaps identified in research; unproven statements of interests; relevance; dimensions; possible limitations and operational definitions of the thesis.

SETTING THE TONE

The heart and soul of this study revolves around revealing a new side of digital wisdom from the perspective of how Artificial Intelligence (AI) as a digital technology manifest ripples of disruption in the Accounting Profession (AP). The disruption features a paradoxical nature of creating opportunities but igniting threats, simultaneously – thereby placing the roles of the profession at a position of either being complemented or replaced. This leaves the Accountants in dilemma and the continuity of the profession, questionable. Thus, it is at this point where the research dwells into investigating how AI creates opportunities and ignites threats in the profession and subsequently looks at the tech-embracing ability of the Accountants, to measure the level of positive and negative influence of AI on AP – thereby revealing the continuity status of the profession.

It is imperative to understand that the researcher carries out a study on one area only, but there are two paradigms in that area, which is the '**Relationship Paradigm**' and '**Level of Influence Paradigm**'. The second paradigm is an extension of the first paradigm and both paradigm have to be studied and experimented one after another in order to provide a complete understanding of the phenomenon preached by the topic of this research study. The paradigms are related and cannot exist without each other. The paradigms are illustrated and explained extensively at the end of chapter 2.

1.1 Research Background

The Earth has witnessed five periods of mass extinction to date (late Ordovician, late Devonian, late Permian, late Triassic and Cretaceous), and in the advent of fourth industrial revolution (IR 4.0), the Bank of England and British national newspapers are reporting that accountants are about to form the sixth mass extinction of the Holocene epoch. The UK *Daily Mail* reports a speech by the Governor of the Bank of England under the headline: ‘Robots to steal 15 million of your jobs’ where the bank predicts that entire professions, such as accountancy, could be pushed to the brink of extinction as developments in computers make roles redundant (Ford and Lobo, 2017). Following this, CNN declares the Bank of America report estimating 90 percent or more risk of accountants being replaced by robots besides the London Evening Standard report in 2018 that dictates ‘as technology develops, it will replace white-collar jobs in fields such as accounting, banking and legal services’ (Briggs, Henry and Main, 2019). One of the reasons for this situations is that Accountants are owing to digitalization as a result of facing paradigm shift in their roles and the way they do things. Another reason is the growing disconnect between the technologies’ potential and their adoption across firms and industries, as well as a widespread misunderstanding of the magnitude of the transformational opportunity digitization potentially provides (Deloitte, 2018).

At this setting of AP in our world today, it is a global call by the International Federation of Accountants (IFAC), the global leader of the accountancy profession, for the profession to respond appropriately to the emerging technologies of IR 4.0 which is mainly characterized by advances in technology, in order to keep the profession away from the brink of extinction. The act of embracing, adopting and implementing technology would allow AP to move with the cycle of evolution and thereby perceive technology as a boon in burnishing profession’s credentials as a trusted advisor, rather than standing still and being left of the sidelines (MIA, 2018).

In response to these demands, the Malaysian Institute of Accountants (MIA) officially released the MIA Digital Technology Blueprint 2018 which specifically features in preparing the Malaysian Accountancy Profession for the Digital World, by positioning technology as a strategic agenda. The blueprint dictates how technology is impacting AP and the five principles to be considered by all Accountants for harnessing digital transformation. Also, MIA established a Digital Economy Task Force to prepare members for the technology disruption that is taking place in the AP.

Artificial Intelligence as a Paradoxical Digital Disruptor in the Accounting Profession.

In recognizing digitalization and transformation, according to KPMG's global technology industry innovation survey, Artificial Intelligence (AI) is ranked second, after Internet of Things (IoT), as the top technology game changer in driving business transformation in the next three years. In the AP, AI is observed to be the most influential digital technologies, in riding the waves of digital disruption (transformation). It is ranked highest from the Accounting ABCDE – Artificial Intelligence, Blockchain, Cybersecurity, Data Analytics and Ethics (MIA, 2018 and Malhotra, Malladi and Sharma 2018).

According to MIA (2018) and CIMA (2016), Artificial intelligence (AI) is transforming the accounting and finance sector. With the ability to learn and adapt, AI is poised to develop increasingly sophisticated capabilities that will allow it to execute a growing number of tasks that accountants perform today. Deloitte (2018) stresses that, given its heavy reliance on numbers and data, the accounting and finance sector is well placed to reap the benefits that AI has to offer. While there had initially been fears that AI would displace accountants, the emerging consensus is that AI will prove to be a boon for accountants because it will allow machines to execute repetitive, mundane accounting tasks while freeing human accountants up to perform higher level activities that will increase their overall productivity (Bobrow, 2019 and Duffy, 2018). It is crucial that accounting professionals keep themselves abreast of key advancements in AI and how they can benefit from developments in this area.

Against this backdrop, it is explicit that the news pertaining the current situation of AP is a result of the waves of digital disruption appearing at unprecedented breadth and scale in the AP - driven by rapidly developed and continuously innovated digital technologies, such as, AI. Thus, AI is at the tipping point. It's no longer a matter of 'when will it happen?' because the technologies in question are already available, and are already transforming accounting firms. This makes it clear how AI as a digital disruptor is interrupting the status quo of AP, just like a megatrend and the interesting fact is that, just like an uncertainty, it is impacting AP at a paradox (Ford and Lobo, 2017).

According to Gob et al. (2019), the paradoxical nature is such that, with significant embracing ability, Accountants are to enjoy opportunities with their roles being complemented by AI, or not they are likely to observe their roles and the profession eventually replaced by AI. Thus, the continuity of AP is questionable – leaving the Accountants in a mixture of cheer and fear.

Artificial Intelligence as a Paradoxical Digital Disruptor in the Accounting Profession.

CIMA (2016) and Malhotra, Malladi and Sharma (2018) supports this by dictating that this can be observed today, where despite many accountants are aware of evolving digital solutions and their potentially positive impacts at a high level, most accountants are slow to address or fully embrace these technologies. The result is a growing disconnect between the technologies' potential and their adoption across firms and industries, as well as a widespread misunderstanding of the magnitude of the transformational opportunity digitization potentially provides.

Thus, it is at this point where the researcher believes that there is a merit into contributing to the ecosystem by equipping Accountants with insights to understand how AI creates opportunities and ignites threats in the profession and the importance of their tech-embracing ability in deciding the level of positive and negative influence of AI they are likely to face. Through this, the research shall reveal the continuity status of the profession.

Thus, if critically analyzed, the true nature of the impact of digitalization and the driven disruption resides in the nature of response towards it. This is when the Accountant's response towards AI in the form of their 'tech-embracing ability' plays a key role in ascertaining the research gaps in this research. It can be said, digitalization and disruption is all about the responses towards it.

Therefore, to reap benefits from AI, accountants are advised to ponder upon long-term vision for AI and AP by focusing on purpose, exploiting this technological advancement, think radically and to be adaptable in every circumstance, be it managing the AI. Also, accountants are encouraged to understand technology in terms of how AI and human intelligence work together and apply this understanding in accounting problems, challenges and issues. (ICAEW, 2017)

1.2 Problem Identification

This section identifies theoretical gap that exists between **actual** and **desired** results based on evaluating and explaining critically on *what is known* and *what is not known*. The **educational issues** revolves around 3 important dimensions: -

First, **paradoxical personality**. In nature, AI is a digital technology, but through increasing potency of digital innovation, it has appeared to be a disruptive technology. This phenomenon turns AI's dual personality of being advantageous and disadvantageous to disruptive personality of being opportunity creator and threat igniter. If noticed, both personalities are occurring at double results of good and bad, just like uncertainty in the environment that occurs at a paradox. Thus, the disruptive personality of AI takes the role of paradoxical personality, in the sense of creating opportunities and igniting threats, simultaneously. It is happening neutrally, because it is a description of what is happening in the environment. This raises concerns as such technological revolutionary could bring advancements in business and economic environment through its opportunity creating attributes, but could drastically threaten the entire industry, through its threat igniting attributes, in terms of undermining the ability to stay in business. Thus, it is imperative to address this concern in the advent of IR4.0, pertaining the capacity of AI is to create opportunities and ignite threats towards the roles of the AP.

Second, **intensity and level of influence**. Upon raising awareness regarding the concerns of AI's paradoxical personality, the educational issue is to investigate which personality side (opportunity creating or threat igniting side) has or potentially can have greater influence on the role of AP. It is vital to uplift balance between opportunities and threats, to allow trade-offs occur. However, if weightage falls too much on one side, it could be potential risk that would need urgent attention.

Third, **changing or replacing AP and the continuity status of AP**. Globally, accountants are fearing the venture of AI into the AP's ecosystem, due to the potential of AI to replace Accounting roles and the AP as a whole. According to BBC, 35% of current jobs in the UK are at high risk of computerization and 53% of all occupations are estimated to be replaced by digital technology within the coming twenty years. According to Oxford University, 45% of jobs will be automated by 2030 and approximately 20%-40% of professional occupations are at risk of automation by smart technologies in the coming years.

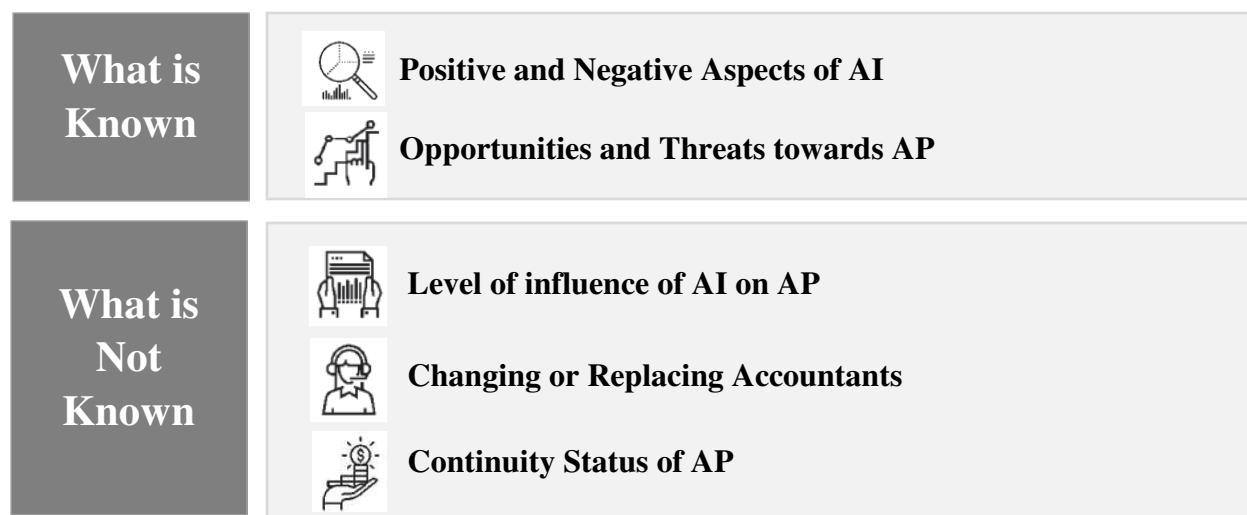
Artificial Intelligence as a Paradoxical Digital Disruptor in the Accounting Profession.

Thus, with this setting of the AP today, every accountant is in deep dilemma pertaining their job security, and where the AP is concerned, pertaining its continuity status. Therefore, it is imperative to ascertain if AI is going to impact AP as a complement or a replacer, as this will eventually reveal if continuity of AP is established or there will be a rebirth of the profession.

Based on the capacity of previous researches and authors, they have dictated the possible opportunities and threats posed by AI, with anticipated intensity the profession to be threaten in terms of their ability to stay in business. However, no author has clearly projected the upcoming reality of future, in terms of, if AI were to change accounting roles or completely replace accountants, and none have extended their study towards determining the continuity or longevity status of the AP. This is the theoretical gap in the study, as '**changing**' or '**replacing**' AP and '**continuity of AP to persist or be halted**' is 'what we do not know'- making research still have ambiguity and paucity, as it has not been empirically tested.

Based on these gaps in the research, it is imperative to develop a complete understanding by collecting both quantitative and qualitative data, because would provide a partial view.

Exhibit 1.0: Problem Statement



Source: Creation by author of this research study

1.3 Research Objective

The information below relates to specific results that the researcher aims to achieve within allocated timeframe and available resources. It promotes the act of beginning with the end in mind.

1.3.1 General Objectives

General Objectives

To examine the **relationship** between AI and AP and the **degree of influence** of AI on AP.

1.3.2 Specific Objectives

Specific Objectives

1. To examine the **relationship** between AI as *Opportunity Creator* on AP.
2. To examine the **relationship** between AI as *Threat Igniter* on AP.
3. To examine the significant **level of influence** of AI as *Opportunity Creator* and *Threat Igniter* on AP.
4. To investigate if AI is **changing** role or **replacing** AP.
5. To ascertain the **continuity status** of the AP.

1.4 Research Questions

The ideology of the research questions is to set the direction towards the research objectives. This is because the questions inhibit the power to maintain the research within its context and thereby lead the articulation of the research towards meeting objectives.

Research Questions

- 
1. Is there a significant **relationship** between **AI** as *Opportunity Creator* and **AP**?
 2. Is there a significant **relationship** between **AI** as *Threat Igniter* and **AP**?
 3. What is the significant **level of influence** of **AI** as *Opportunity Creator* and *Threat Igniter* on **AP**?
 4. Is **AI changing role or replacing AP**?
 5. What is the **continuity status** of the **AP**?

1.5 Research Hypotheses

The hypothesis have been crafted in declarative sentences to ensure the research gives relevant answers to the research questions. It is to maintain the answers to the research questions within its context.

NO		HYPOTHESES
H1	H_0	There is no significant relationship between AI as <i>Opportunity Creator</i> and AP.
	H_1	There is significant relationship between AI as <i>Opportunity Creator</i> and AP.
H2	H_0	There is no significant relationship between AI as <i>Threat Igniter</i> and AP.
	H_1	There is significant relationship between AI as <i>Threat Igniter</i> and AP.
H3	H_0	There is no significant level of influence of AI as <i>Opportunity Creator</i> on AP based on the <i>Tech-Embracing Abilities</i> of Accountants.
	H_1	There is significant level of influence of AI as <i>Opportunity Creator</i> on AP based on the <i>Tech-Embracing Abilities</i> of Accountants

1.6 Mixed Method Purpose Statement

Based on these gaps in the research, it is imperative to develop a complete understanding by collecting both quantitative and qualitative data, because either would provide a partial view.

Thus, the study embarks on mixed methods that will address the paradoxical relationship between AI and AP and the significant level of influence of AI on AP. A convergent parallel mixed methods design will be used, and it is a type of design in which quantitative and qualitative data are collected in parallel, analyzed separately, and then merged.

In this study, questionnaire data will be used to test the theory of relationship that predicts that “AI as a paradoxical digital disruptor” will positively and negatively influence the “evolving role of accountants in the AP”. Also, the significant level of influence of AI on AP shall be tested.

Concurrently, qualitative data from interview session will be used to explore the “relationship between AI and AP” and the “significant level of influence of AI on AP” based on the “tech-embracing ability of accountants” – thereby to reveal the continuity status of AP.

The reason for collecting both quantitative and qualitative data is to converge, validate, corroborate and communicate the two forms of data to bring greater insight into the problem than would be obtained by either type of data separately.

1.7 Research Significance

This study investigates how AI as a digital disruptor impacts AP at paradox of '*creating opportunities*' and '*igniting threats*', simultaneously. Thus, it aims to make contributions to the current revolutions of technological advancement and its applications towards accounting and finance environment.

The rise of disruptive technologies in the AP's ecosystem triggers transformation towards the roles and practices of accountants – thereby interrupting their status quo. This ideology of disruption demanding transformation in the profession relates to the practice of addressing 'change' as the new norm. This is something that may be resisted than embraced at first hand – thereby initiating the importance to ascertain the possible impact that the AP is likely to experience and the associated response of the profession towards technologies (Goh et al., 2019).

Against this backdrop, the importance of this research is to build awareness amongst Accountants regarding the IR4.0 technologies, the disruption occurring and the significance of an Accountant's tech-embracing ability in order to be complemented and not replaced by technology, and to establish continuity for the profession. This is so that it cleanses the misconceptions pertaining the technology's ability of leaving the profession at the brink of extinction.

Consequently, the research is interested in contributing towards the initiatives taken by MIA that officially released the MIA Digital Technology Blueprint 2018 - which specifically features in preparing the Malaysian Accountancy Profession for the Digital World, by positioning technology as a strategic agenda. The blueprint talks about how technology is impacting AP and the five principles to be considered by all Accountants for harnessing digital transformation. Also, MIA established a Digital Economy Task Force to prepare members for the technology disruption that is taking place in the AP (MIA, 2018).

It is important to note that this study is not a repetition of a historical past discussed in different perspective. AI may have emerged decades ago, however, this study discussed about current impacts of AI due to recent developments and innovations. AI is a current affair in accounting as of 2020, and a revolutionary that every accountant should fully exploit to solve real problems and get maximum value, in ideology of replicating how we do things using different tools.

Artificial Intelligence as a Paradoxical Digital Disruptor in the Accounting Profession.

The researcher believes this study could contribute various benefits in several perspectives as follows: -

1.7.1 Theoretical Perspective

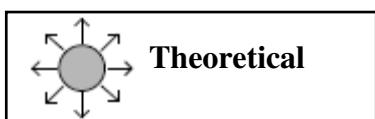
This research is illustrated with critical emphasis and intricate focus, clearly crafting connection that exist between AI and AP in which AI creates disruption - leaving its impacts on AP at a paradox of creating opportunities and threats, simultaneously. This concept is associated with the doctrine of uncertainty but has been applied to digitalization in this context. This may help researchers of tomorrow develop sophisticated ideology to support their future findings.

1.7.2 Accountants of the Four Sectors Perspective

Since AI is most discussed and debated topic worldwide after revolutionaries like cybersecurity, cloud computing, and big data, it is essential that accountants in Malaysia and worldwide be aware and reflect upon the magnitude of transformational opportunity AI potentially provides, rather than fearing it and standing still, which would be the biggest risk. This applies to all accountants from the four major sectors namely, commerce and industry; public sector; public practice and academia. The emphasis is to be aware of digital technology trends and how they affect roles, identify capabilities and build differentiated skills in responding to change, capitalize on the use of appropriate digital technology; determine funding needs and adhere to good governance practice. This would be the stepping stone toward the tech-embracing ability of Accountants in adopting transformation and implementing AI in their firms.

1.7.3 Academic Perspective

This research is unique as it has combined two different industries, the **Accounting** and **IT** industry. Thus, the technical part of AI applied and explained in this research could help IT students understand which '**technical parts**' of AI would be most useful in accounting industry. And, the accounting students could learn how accounting is becoming '**tech savvy**'. Thus, it is collaboration of **two different worlds**, acting as exemplary source for future students having interest in crafting similar research regarding AI and AP.



1.8 Research Scope

This section identifies the boundary surrounding the study – in terms of the extent to which the research is performed.

First, **industry** - the study focusses on accounting industry with some knowledge of the IT industry to explain algorithms and operating mechanisms of AI- without which is difficult to show connection between AI and AP.

Second, **profession** - in the context of this research, the AP is addressed to be an occupational body for all white-collar accountants; and the term accountants refer to individuals that are practitioners of accountancy, in the industry, with a minimum of bachelor's degree qualification and are members of the Malaysian Institute of Accountants (MIA), following the Accountants Act 1967. The AP is further addressed following the MIA category of employment where - referring to the term ‘Accounting Profession’, it means the researcher makes reference to Accountants in the following 4 sectors of the Accounting and Finance industry namely, commerce and industry; public sector, public practice and academia.

Third, **area** - Malaysia is the chosen regional area, as the study is an extension of technology blueprint initiatives taken by MIA in preparing the Malaysian Accountancy Profession for the Digital World, by positioning technology as a strategic agenda. Also, the researcher resides in Malaysia, thus carrying out test would be convenient and practical.

Fourth, **respondents** - white-collar Malaysian accountants who are practitioners of accountancy, in the industry, with a minimum of bachelor's degree qualification and are members of the Malaysian Institute of Accountants (MIA), following the Accountants Act 1967 are chosen to be part of researches source of data collection.

Fifth, **methodology** - in the pursuance of collecting data, convergent mixed methods is adopted, where the quantitative approach of distributing questionnaire and qualitative approach of carrying out one-on-one semi-structured interview is practiced, to provide complete understanding of the phenomenon studied by the research.

Sixth, **unit of analysis** - the results are going to be derived from individual accountants from any of the four sectors mentioned above.

1.9 Research Limitations

This section explains **constraints** that prevent the research to be dictated at extreme perfection.

First, **availability of data** - this research is a study on the current phenomenon of disruption occurring in the AP's ecosystem. It is a current affair of the IR4.0, and since it is ongoing, it is arduous to find sufficient number of corporate and academic journals, because it is that period where institutions and firms are beginning to release reports and blueprints on digital technology.

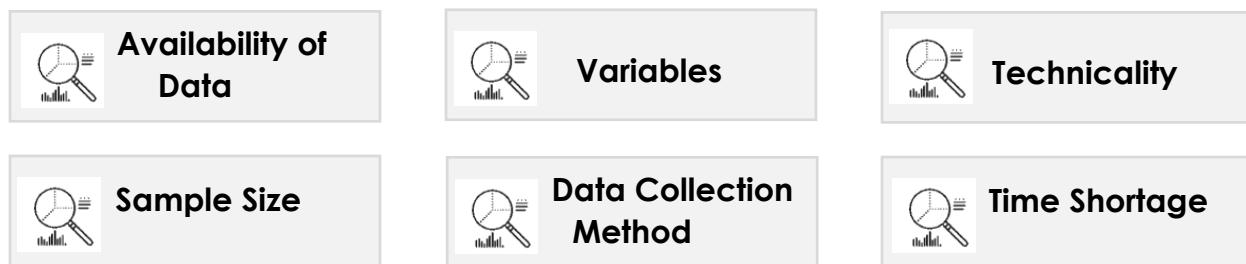
Second, **variables** – there may be several other variables and determinants that may play a key role in bridging the AI and AP relationship, but may have not been mentioned in this study due to the limited scope.

Third, **technicality** - this study is performed by an accounting and finance undergraduate, thus technical aspects of AI may have not been identified, explained and justified in accurate manner in comparison to how an IT undergraduate would perform.

Fourth, **sample size** - the sample size chosen for quantitative and qualitative data collection is limited to 120 and 9 Accountants that are practitioners of accountancy, in the industry, with a minimum of bachelor's degree qualification and are members of the Malaysian Institute of Accountants (MIA), following the Accountants Act 1967.

Fifth, **data collection method** - the quantitative data collected through questionnaire may be subject to biasness at instances where respondents omitted to uplift the highest form of integrity.

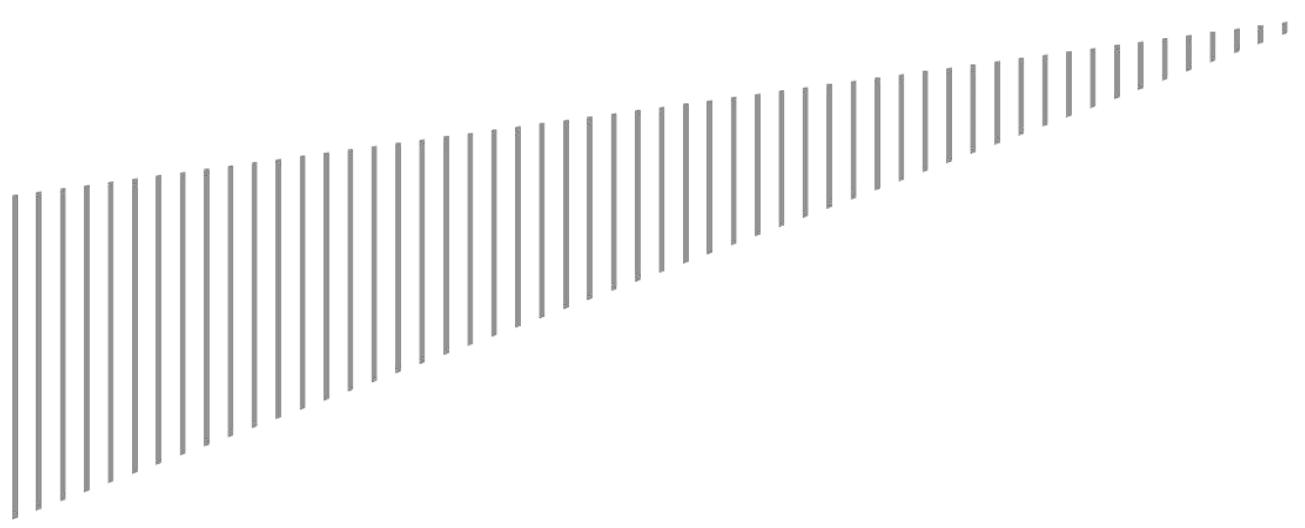
Sixth, **time shortage** – this research is a dissertation that reached completion within the time frame of twelve months. Due to limited time, the research may not be very extensive.





CHAPTER 2

LITERATURE REVIEW



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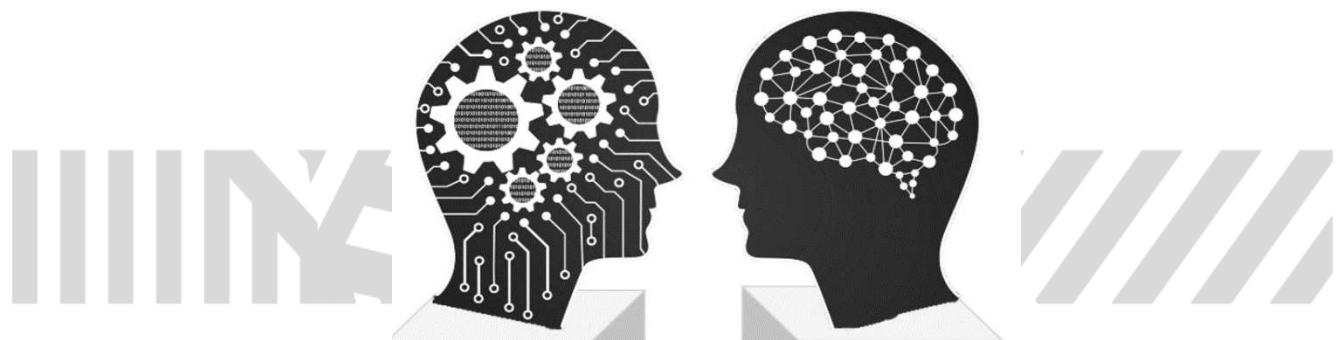
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2.0 Introduction – Setting the Tone of the Literature

The potency of digital innovation make technologies disruptive. It is at this point where the AI is observed to revolve around the ecosystem, featuring the attributes of megatrend. Since the AP happens to exist within the same ecosystem, the AP is expected to respond towards this megatrend. Amid this backdrop, the research embarks on a quest to ascertain the nature of the ecosystem, the phenomenon and the evolving role of accounting profession with AI, under the doctrine of digital disruption. To accomplish this, the researcher performs an extensive review of literatures written by numerous authors to dictate the digital ecosystem and the related phenomenon within the context of its true nature but in a better presentation, interpretation and justification, that contributes to the AP.

The review of literature is the foundational essence of this study that helps the researcher collect information pertaining the intended study and build a strong platform in justifying the feasibility of the study.

The literature is written in a manner that identifies all the components of the conceptual research framework and the paradigms embedded in the research framework. It begins with AI and then the theory of disruption that is followed by the identification of AP in the ecosystem, before AI and AP are integrated and dictated following the doctrine of digital disruption.

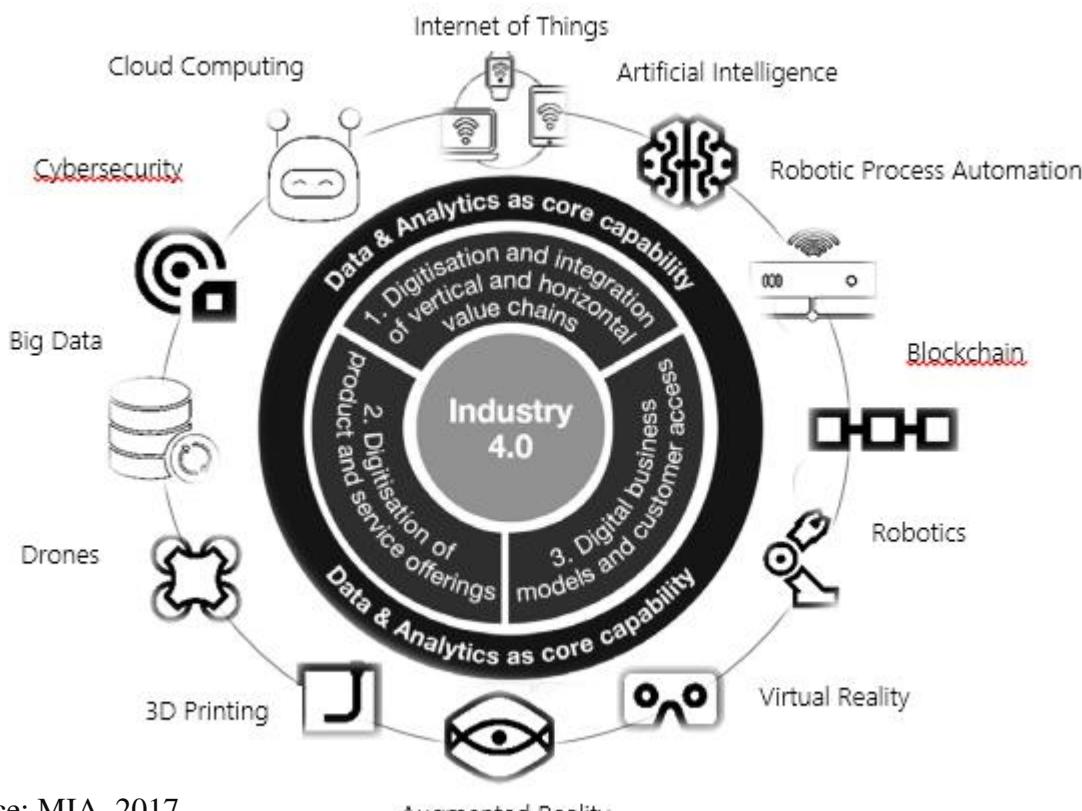
2.1 Artificial Intelligence and Digital Disruption

The following paragraphs intend to identify and introduce AI within the context of digital technology and subsequently within the context of digital disruption. This is because AI appears to be a disruptive technology and it is imperative to identify it under both contexts to clear any misconceptions. The reason being AI and digital disruption are often areas misunderstood by people, let alone their interrelatedness.

2.1.1 The Key Disruptive Technologies Today

In the advent of the fourth industrial revolution, there are several emerging technologies. However, the following are the top disruptive technologies riding the waves of transformation as dictated by Professor Klaus Schwab, Founder and Executive Chairman of the World Economic Forum, in his published book entitled *The Fourth Industrial Revolution* in which he describes the fourth revolution is fundamentally different from the previous three, which are characterized mainly by advances in technology (Goh et al., 2019 and MIA, 2017).

Exhibit 2.0: The Emerging Technologies



Artificial Intelligence as a Paradoxical Digital Disruptor in the Accounting Profession.

Advances in technologies focuses on the end-to-end digitization of all physical assets and processes as well as integration into digital ecosystems with value chain partners. Based on this circle of technologies, Artificial Intelligence (AI) is observed to be the most influential digital technology riding the waves of disruption today (Nilsson, 2019 and Robert, 2017).

2.1.2 Introducing Artificial Intelligence

According to Vasarhelyi and O'Leary (2016) and Nilsson (2009), the term '**Artificial**' denotes something '*unnatural*' and '**Intelligence**' implies '*intellectual capacity to acquire and apply knowledge*'.

Thus, when both terms come together as '**Artificial Intelligence (AI)**', it simply dictates "*an aspect of brainpower that has not been naturally manifested through universal cycle of creation, but, rather an aspect of natural brainpower, donated by men to their own innovative creation*" (ICAEW, 2017). It is a creation of fake clone and carbon-copy of human that can do more than a human, due to absence of scientific biological system, which often limits men to perform tasks towards extreme efficiency and perfectness. In short, humans get tired, but machines do not, and so, machines do things better than man, but all under, imitation grounds. (Swarup, 2012 and ICAEW, 2017)

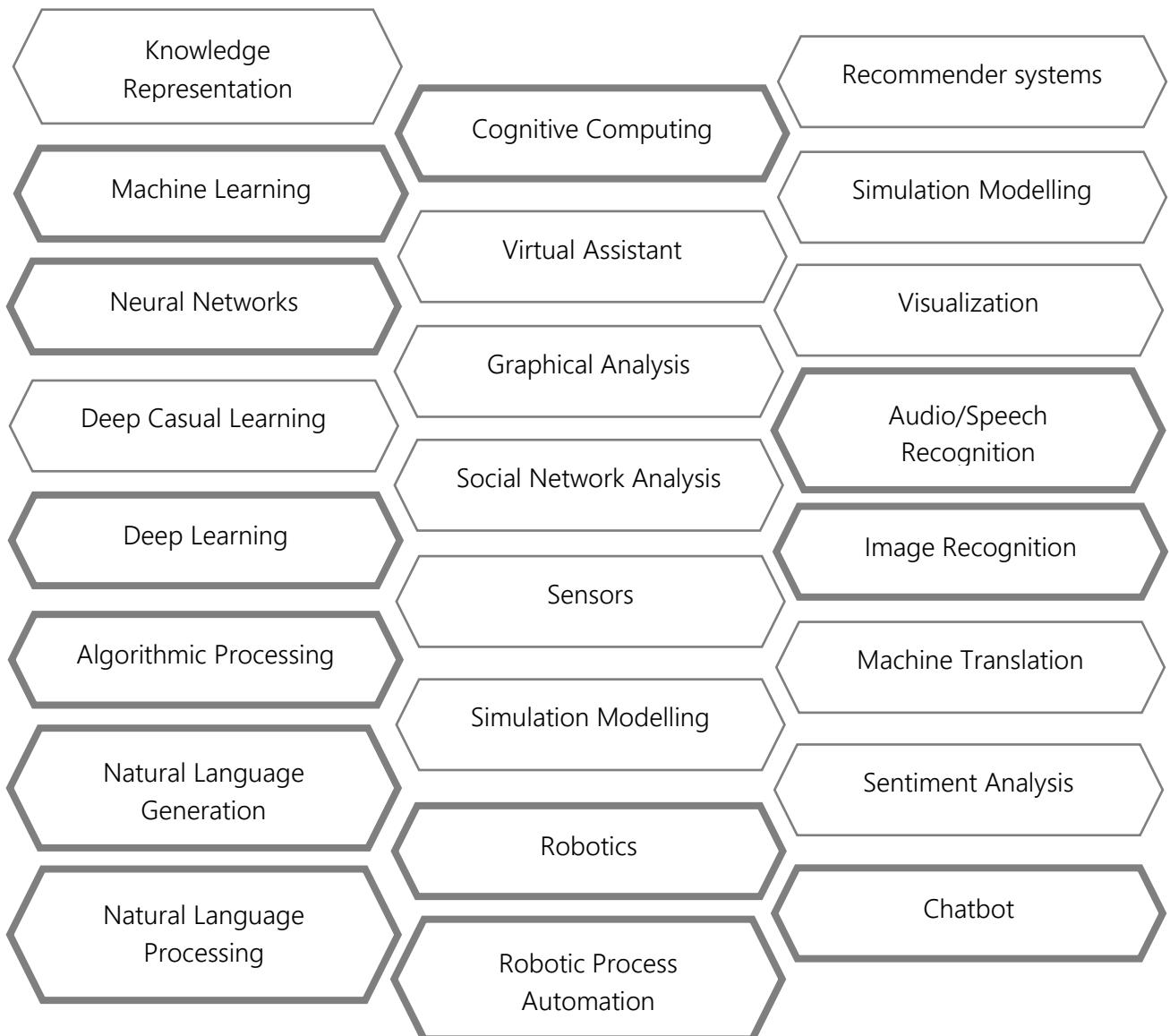
According to MIA (2018) and Duffy (2018), AI is a man-made technological creation that is non-human, but programmed through proficient lines of algorithms (set of rules and instruction in programming language given to AI), to possess behavioral (acting) and intellectual (thinking) attributes of human. Technological advances through the increasing potency of digital innovation is transforming the appearance of AI, from a machine-like outlook, to a human-like figure-supported by conceptualization of robotics.

Artificial Intelligence as a Paradoxical Digital Disruptor in the Accounting Profession.

2.1.3 Artificial Intelligence and The Host of Cognitive Technologies

The term AI often refers to a group of technologies which through their use and functions gives AI its true functionality (.Vaidyanathan, 2018)

The following are the technologies that are associated with AI – better known as known as Cognitive Technologies.



The highlighted technologies resemble the most popular technologies used in executing the AI functionality.

2.1.4 Navigating the Dual Personality of Artificial Intelligence

Based on critically defining AI, it is imperative to understand that AI is a **digital technology of IR 4.0**, where just like any other invention or innovation, it possesses to have a **double outlook** or **dual personality** of being **advantageous** yet **disadvantageous** over a period of time.

This setting is often observed due to the rapidly increasing potency of digital innovation that nurtures AI in a way, that at implementation, it drives transformation both positively and negatively. (Boden, 2017 and Goh et al., 2019)

It is at this point, AI is recognized by the researcher as a '**complement**' but a '**replacer**' – where through its function and core purpose of existence, it aid and complement humans in '**creating opportunities**' in every task they perform. This is why invention of AI ignited, where the mission was for AI to **possess human-like intelligence**, so that it can work with and **aid humans**, especially to do what humans cannot accurately and precisely do. However, according to Zaani, Rios and Sampanthar (2018), the concept of aiding is observed to be **predominant** towards certain extent, as the **rapidly escalating ability** of AI to **completely perform a task**, even better than human experts, positions AI to go beyond aiding humans to **replacing them, their job descriptions and their profession**.

Upon addressing **AI's dual personality**, according to Shabbir and Anwer (2015), it is imperative to understand and identify that regardless of AI being a **complement or replacer**, the **controller is still the human** – for **human is ultimate creator and user of AI**. *The question is how ardently human prefers to manage and embrace AI?* Boden (2017) and ICAEW (2017) suggests that the economist theory preaches that; the more AI is managed and embraced with **intellectual and controlling expertise**, the more AI is to stay **within boundaries** of complementing. Slaking to do so, according to Vaidyanathan (2018), shall **easily allow AI exceed boundaries** and begin **overpowering human**. Therefore, in such a perspective, intensity of AI's dual personality is **decided on management and embracing desire** towards AI, if managed and embraced well, unfavorable **uncertainties** could be **mitigated**.

2.1.5 Introducing Digital Disruption

According to Ronald Tocci, the term ‘**digital**’, in a more conceptual level, can be formally implied as a ‘data technology that uses discrete (discontinuous) values’; whereas the term ‘**disruption**’, according to Singapore Prime Minister Lee Hsien Loong (2016), is the ‘defining challenge’ for the local economy now and in the foreseeable future - and is the arrival of an uncertainty that interrupts the status quo, thereby driving change for business, economy and society as whole (Goh et al., 2019 and Malhotra, Malladi and Sharma (2018).

Thus, according to Briggs, Henry and Main (2019), when both terms come together as ‘**digital disruption**’, it is simply the change that occurs when new digital technologies and business models impact the value proposition of existing business. This is supported by Farrar (2019) and CIMA (2016) where the idea of digital disruption is about how much additional change a business will experience in the years to come, and how a business can realize its potential across a spectrum of digital opportunities by building on the way it currently uses digital technologies and organizes business processes. This is further supported by Deloitte (2018) where digital disruption is the changes – truly a description of what is happening in the ecosystem, appearing just like an uncertainty, posing opportunities and threats, at somewhat neutrally.

The key role players behind digital disruption are the digital disruptors. ‘**Digital disruptor**’ is a digital technology where through accelerating innovation and the rising need for business to up-skill, re-skill and cross-skill, qualifies it to be a disruptive technology, and thereby a disruptive innovation. In other words, a digital technology that possesses the ability and potential to interrupt the status quo, thereby driving the waves of disruption (Deloitte, 2018).

2.1.6 Navigating the Paradoxical Personality of Digital Disruption

It has been over 20 years since the theory of digital disruption was unleashed – particularly in the 1997 book ‘*The Innovators Dilemma*’ by Harvard Business School Professor Clayton M. Christensen, whom precisely identified and revealed the secret regarding the waves of change that are appearing and shall continue to appear in the near future (Goh et al., 2019). The only difference, it will come at **unprecedented breadth** and **scale** in the coming years due to the increasing **potency of digital innovation**. This is what economist Joseph Schumpeter acknowledged to be the crystallization of disruption, addressed as ‘**the gales of creative disruption**’ (Zaani, Rios and Sampantar, 2018).

If noticed carefully, digital disruption tends to be frequently addressed as ‘**wind**’, ‘**waves**’ and ‘**gales**’. This is because, just like the **natural phenomenon** that are **uncertain**, digital disruption itself is an uncertainty revolving around the environment (Deloitte, 2018). The only difference is that natural phenomenon is circulated by the nature, whereas digital disruption is circulated by the **potency of digital innovation** (Robert, 2017).

In regards to uncertainty, a famous theory of digital disruption is ‘in the advent of digitization, what is constant is change and what is certain is uncertainty’.

It is this very nature of **uncertainty** that gives digital disruption a **paradoxical personality** – a personality that showcases the **potential** of digital disruption to **create a paradox** (KPMG, 2016). KPMG (2016) and Pan et al. (2017) clarifies that it is imperative to understand that there are several interpretation of the term ‘paradox’ – where the most accurate synonym to it is ‘**contradiction**’, which remains same in this context, but the most precise interpretation of ‘paradox’ in the context of digital disruption is the ‘**double impacting potential**’ of disruption – where the **transformation** or **change** it drives can ‘**enable productivity**’ but at same time ‘**undermine ability of company to stay in business**’. This theory is supported by Deloitte (2018) – where they say ‘we refer to changes; both positive and threatening, as digital disruption’.

This means, towards a certain extent, digital disruption does **contradict** itself, because it can ‘**impact positively**’ but ‘**impact negatively**’, **simultaneously**.

Artificial Intelligence as a Paradoxical Digital Disruptor in the Accounting Profession.

Therefore in this research, the positive and negative impacting potential of digital disruption is addressed as '**opportunity creator**' and '**threat igniter**' – where digital disruption possesses ability to create myriads of opportunities but simultaneously poses a threat to the industry.

Thus, it at this point that the **paradoxical personality** of digital disruption can be **recognized** to have its impact, at somewhat, '**neutral**'. This is because it is an uncertainty that creates both opportunities and threat concurrently. This is supported by Deloitte (2018) where they state 'digital disruption is a neutral term; a description of what is happening' .

2.1.7 Artificial Intelligence as Paradoxical Digital Disruptor

Based on the **dual personality of AI** and the **paradoxical personality of digital disruption** implied in the two sections above, it clearly shows, how dual personality of AI is **strongly connected** to the paradoxical personality of digital disruption.

The ideology is that it is only through the **paradoxical personality of digital disruption** that the true nature and significance of **AI's dual personality** is revealed. This means that the 'positive' and 'negative' personality of AI now ventures into the paradoxical digital disruption terminologies 'opportunity creator' and 'threat igniter' (Pan et al., 2017).

Thus, AI gets addressed in the most accurate and appropriate as a **paradoxical digital disruptor**. This is because the positive and negative impact of AI is exactly the same as opportunity creating and threat igniting impacts of digital disruption (KPMG, 2016)

It is completely possible for AI as a **digital technology** to be a **paradoxical digital disruptor**, because the concept of digital disruption itself is a consequence of the rapidly escalating **digital innovation** that is performed on AI. In other words, digital disruption is the result of AI being continuously developed through extensive innovation, till AI is observed to be the force of change and the driver of transformation. It is at this point, that AI can be revered and recognized as a **disruptive innovation** (Zaani, Rios and Sampanthar, 2018).

Thus, in the most precise manner, AI can be justified as a paradoxical digital disruptor – creating opportunities and igniting threats.

However, this outlook of AI is observed to drive current and the next wave of disruption, thereby impacting businesses, companies, industries, institutions and professions. One of the major professions that is impacted is the Accounting Profession.

2.2 Artificial Intelligence and the Accounting Profession

The following paragraphs intend to identify and introduce the AP and the outlook of AI in the profession in terms of how AI is perceived, adopted and implemented. It is imperative to review this literature to clear misconceptions pertaining the context of AI in the AP.

2.2.1 Introducing the Accounting Profession

According to Russell and Norwig (2016), the **6000 years** old art of **Accountancy**, used probably even before or since the Stone Age, the Egyptians and the Romans, has turned into a significant profession out of its occupational attributes featuring prolonged training and formal qualification. To be exact, the development of modern accounting and its molding process into a profession began during the Renaissance period in Italy when Luca Bartolomes Pacioli published double-entry bookkeeping system, an imperative invention for a modern look of Accounting. (CPA, 2018 and Mann, 2018)

Since medieval period, business record-keeping has always followed the doctrine of double-entry accounting. However, the business processes employed in creating the transaction record and the manner in which auditor verify accuracy and completeness of those record have changed, over time (Vaidyanathan, 2018).

Regardless, according to Bobrow (2019) and Malhotra, Malladi and Sharma (2018), an accountant from the late 1500s and one from the 1900s would share sufficient amount of understanding pertaining the underlying tone and concept of double-entry, for them to have a professional conversation in a meaningful way. This shows how accountancy have kept up with developments, but at the same time have preserved the authentic concept of common elements.

Today, Accounting Profession (AP) is the most important professional group in business and economic environment that never fails to radically improve quality and business investment decisions through enhancing their roles. (ICAEW, 2017 and Simon, 2018)

In the context of this research, the AP is addressed to be an occupational body for all white-collar accountants; and the term accountants refer to individuals that are practitioners of accountancy, in the industry, with a minimum of bachelor's degree qualification and are members of the Malaysian Institute of Accountants (MIA), following the Accountants Act 1967.

Artificial Intelligence as a Paradoxical Digital Disruptor in the Accounting Profession.

The AP is further addressed following the MIA category of employment where - referring to the term ‘Accounting Profession’, it means the researcher makes reference to Accountants in the following 4 sectors of the Accounting and Finance industry: -

First, **Commerce and Industry** - accountants that play role of Chief Finance Officer (CFO) or work in finance functions of public listed companies or small and medium entities (SMEs).

Second, **Public Practice** – accountants that provide myriads of service to clients through accounting, auditing and assurance, tax consultancy, transaction advisory services and advisory services (MIA, 2017).

Third, **Public Sectors** – accountants working in public entities including Federal and State government, Federal Statutory bodies and local authorities where for example planning future government programmes and services and assessing the sustainability of government policy, especially in light of demographic trends (MIA, 2017).

Fourth, **Academia** – accountants that are academicians responsible towards producing future accountants and are contributors towards research on current issues influencing accounting and the profession (MIA, 2017).

Exhibit 2.1: The Employment Sectors in the Accounting and Finance Industry



Source: MIA, 2019

2.2.2 The Venture of AI in Accounting

According to Wisskirchen (2017), Nilosson (2009), ICAEW (2017) and Baldwin, Brown and Trinkle (2006), accounting and finance industry represent among the earliest sectors to indulge their operations and specific task into technologies. SAGE UBS financial accounting, SQL, AXP Audit and SAP Enterprise Resource Planning are some of popular accounting system and software used to perform financial accounting, payroll, and audit to make information available in real time.

Out of the many technological phases, today AP experiences the inevitable wave of digital disruption driven by the key revolutionary, AI. According to research performed by KPMG (2018), AI is the second ranked technology expected to drive business transformation over next 3 years.

According to Deloitte (2028) and Vaidyanathan (2018), one of the key reasons AI appears around the AP's radar is 'data'. The Accounting field is immensely data-intensive with proliferation of data being the key driver inviting the waves of AI closer to AP.

Statistics according to Ford and Lobo (2017), show around 90% of all the digital data in the world has been created since 2016. And the rate at which new data is being generated is not just growing, but appears to be growing exponentially, rather than in an incremental or linear manner. This is argued by Goh et al. (2019) and MIA (2017) that AP may not be interested in all data, but great portion of data pertaining financial transactions is of interest to accountants.

This may be the cash that have been replaced by digital methods; growing volume of financial transactions after the streaming services and cloud-based hardware and software solutions; and the increasing participants in the global financial system where from 2011 to 2018, over 1.2billion people entered the financial system for the first time, and each of them is a source of financial transactions that did not previously exist (Briggs, Henry and Main, 2019).

Thus, the AP at this setting is definitely seen to experience a drastic way of disruption led by AI – where according to MIA (2019), AP will face 3 major changes: -

- 1) Evolving Smart and Digital Technology**
- 2) Continued Globalization of Reporting and Disclosure Standards**
- 3) New methods of Regulations**

Artificial Intelligence as a Paradoxical Digital Disruptor in the Accounting Profession.

This is mainly possible especially when AI observes AI to be excellent at the following: -

Exhibit 2.2 The Qualities of AI that interest the AP

AI's qualities:	Means that AI can be useful when:	Which creates opportunities to do things more:
Ability to repeat processes and tasks quickly, completely and consistently.	A process is highly routine and elements of judgement can be expressed as sets of rules.	Efficiently 
Ability to process, structure and analyse large amounts of data.	There is too much information for a human to consider on a consistent and thorough basis devoid of human bias.	Effectively 

Source: Russell and Norwig, 2016

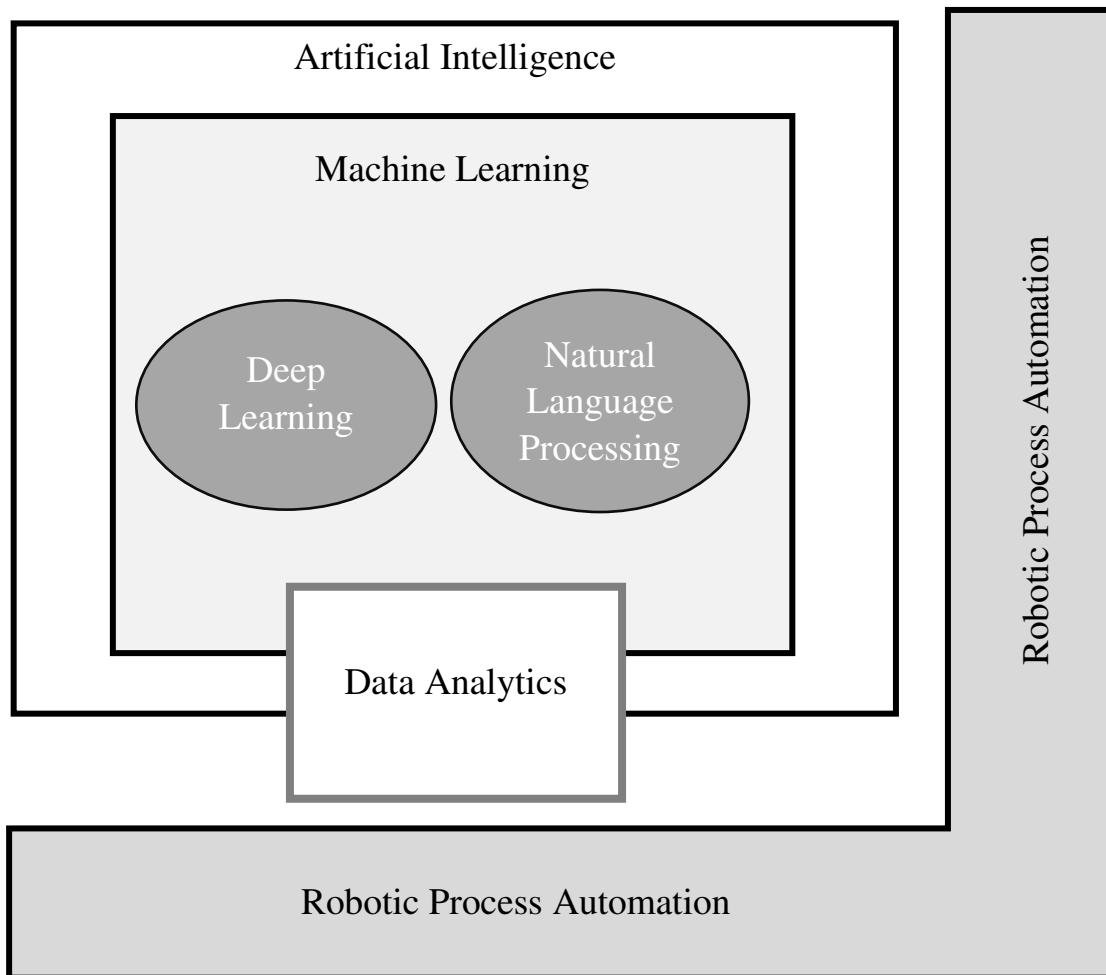
According to Vaidyanathan (2018) and Cima (2018), the wave of AI is travelling everywhere. According to John Chambers, the executive chairman of Cisco Systems said that “at least 40% of all businesses will die in the next 10 years if they do not figure out how to change their entire company to accommodate new technologies”. However, every field describes AI according to how AI appears to them.

The AP have their own manner in which they address AI. **Thus, the following paragraphs closely dictate AI based on how it appears in Accounting and the AP.**

Artificial Intelligence as a Paradoxical Digital Disruptor in the Accounting Profession.

The manner in which AI appears in Accounting is somewhat like the model below: -

Exhibit 2.3: The AI Model in Accounting



Source: ACCA, 2014

2.2.3 Application of AI in Accounting Areas

General Accounting

Intelligent Bookkeeping - For example, the market offers products that are able to scan expense receipts and classify them automatically. The more advanced of these products use a combination of reinforced learning and NLP to automatically parse, extract, and classify scanned receipts without the submitter having to type in any identifying information. For example, if a company's product has over 6m users and over 60,000 companies using their solution, and process billions of transactions each year (Deloitte, 2018).

Invoice Coding and Bank Reconciliations - Online accounting software provider Xero announced in May 2018 that its ML software had already made more than 1bn recommendations to customers since it became available, with areas of invoice coding and bank reconciliations being prominent. This figure includes more than 750m invoice and bill code recommendations, and more than 250m bank reconciliation recommendations. Xero estimates that with 800,000 invoices filed each day in Xero this is a collective saving of 307 hours (Deloitte, 2018).

- **Invoice Coding** - Xero software ‘learns’ how a business codes regular items and auto-fills on the basis of this ‘understanding’ of history, rather than the labor-intensive traditional use of default codes. Using this approach, it correctly codes 80% of transactions after just four examples. The company’s blog post suggests that it is using a logistical regression approach to get the best prediction (EY, 2018).

- **Bank reconciliations**- Xero ML software integrates with that of many banks, which feed account transaction records automatically into Xero. It then matches bank transactions with payment and receipt records in Xero, with automated coding based on how similar transactions have been previously coded. As with invoice-coding, the ML for bank reconciliation incorporates user modification to transaction matching to improve recommendations (KPMG, 2016).

Audit and Assurance

Audit Risk and Risk Strategy - When auditors determine a risk strategy, they partly base it on knowledge that they gained during previous audits. The AI empowered **GRAPA** (Guided Risk Assessment Personal Assistant) is used in marking out chosen risk strategies against all other risk strategies used before. Thus, auditors are not only using their knowledge and experience but also those of all the previous fellow auditors in determining risk strategy. GRAPA is not a standalone application, but software that acts like a smart personal assistant having knowledge of the pooled expertise of auditors in the company - thereby helping auditors carve the best risk strategy to kick-start their audit. GRAPA is just an assistant, because when it comes to critical consideration of processes, developments and risks, it needs creativity and human intelligence. (Deloitte, 2012)

Accounting and Auditing Standards - **Chatbots** are beginning to be used in Accounting to guide professionals through chunks of accounting and auditing standards. The chatbot play question-answer game, for example, the chatbot asks whether the user is looking for an accounting or an audit issue, and then poses follow-up questions (Deloitte, 2012). The smart **algorithm** uses those questions to guide one to the appropriate information. The communication is like a Skype or WhatsApp chat, using natural sentences (Farrar, 2019).

Cost and Management Accounting

Transfer Pricing - If a company forms part of an international group, the prices and conditions applied to the sale of goods and services within this group must be similar to those of third parties. This is intended to prevent improper diversion of profits between countries. However, which prices of which companies are deemed ‘similar’? Thus, **AI Benchmark** is a technology in Accounting that uses **Robotic Process Automation (RPA)** and AI to automatically estimate to extent which company is similar and test how the intercompany prices relate to the market, and substantiate this with detailed documentation. Thus, AI Benchmark is fed with large quantities of data from previous benchmark studies and it is trained through **natural language processing, neural networks** and **ultra-precise entity recognition algorithms**. (Deloitte, 2012)

Taxation

Tax Case and Precedents - TAX-I is a virtual legal research assistant in Accounting that is able to use AI to analyze thousands of tax cases of the European Court of Justice, relate them to similar, summarize them and even predict how a court could rule in a case. It uses a **machine learning** algorithm that is trained to recognize patterns in tax cases and to draw conclusions. All 1153 tax cases of the EU Court of Justice have now been entered into TAX-I. (Deloitte, 2012)

Tax Query System – through reinforcement learning, chatbots and full-speech recognition AI system are being used to answer questions conversationally. This was experimented at EY Malaysia where the AI system won over human tax expert in suggesting the tax regulations, regulatory rulings and case law for a tax case. A similar scenario was observed at KPMG which wanted to measure their AI – IMB Watson’s ML capability in providing good tax advice for corporation with significant R&D investment. After training of over 10000 document case and results, Watson was able to give correct advice to about 75% of queries in comparison to human operators whom were correct only 57% of the time. Another example is AskMyUncleSam – which is a chatbot that dispenses tax advice to US taxpayers. (Vaidyanathan, 2018)

Risk Advisory

Lease Contracts and Contract Analysis - In accordance with the new IFRS 16 accounting standard, virtually all lease contracts must be listed on the balance sheet from 2019. For a telecoms company, for example, which leases every mast and every plot of land on which that mast stands, this means it will be required to go through hundreds of thousands of contracts in all manner of different languages (Deloitte, 2012). Risk advisory in Accounting employs **machine learning** and **Natural Language Processing (NLP)** -empowered **DocQMiner** that extracts relevant data points from contracts – assisting contract analyst with smarter suggestions. It features **neural work** that understand sentence structure and how words relate to one another. This is converted to figures for calculations and predictions. It gains experience over time, for example about lease contract and remembers its experience. (Deloitte, 2012)

Financial Advisory Services

To study client's finance system before advisory - BrainSpace, a smart tool that search through unstructured data (such as email, word document and PowerPoint presentations), categorizes data and renders it understandable with extraordinary speed and accuracy, using **machine learning** and **cluster analysis**. It shows what types of documents exist, and can make an initial selection based on our instructions, besides clustering data and providing a summary of them. Also, BrainSpace shows what is being discussed and by which individuals, and how topics of discussion relate to one another in the email correspondence that has been found. Then it presents the data. For example, we can show our clients breakdowns in visually appealing formats, which make it clear to see at a glance what have been found. (CIMA, 2016)

Forensic Accounting

Improving Fraud Detection through Risk Assessment – AI and ML empowered algorithms go through supervised learning that assist in identifying characteristics that warrant greater scrutiny to target focus area for audit and audit testing. This is performed based on empirical data and professional judgment to access likelihood of fraud, inaccuracy, misstatements besides supporting assertions. For example, a governmental body CAG in India, to predict the risk that a given firm is fraudulent, historical set of 700 audited firm data was input into 10 different algorithms and 93% of the time the algorithms correctly identified the most suspicious firm. (Ford and Lobo, 2017)

Fraud in Expenses - AppZen is and AI empowered ML that works on a real-time fraud-detection engine that connects to a company's existing expense-management tools. (Deloitte, 2012)

Non-Financial Reporting

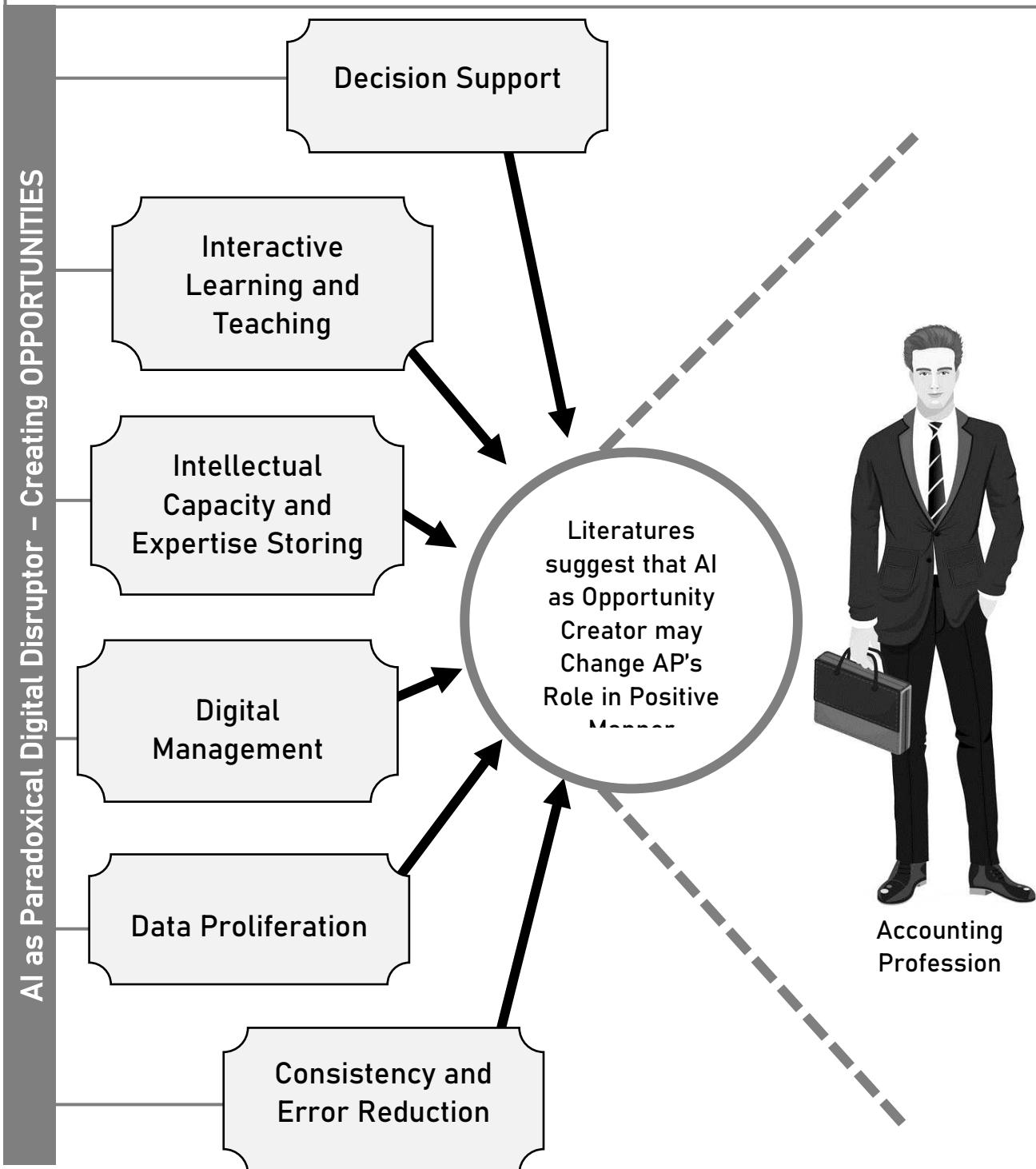
Reporting and Materiality - Reporting towards non-financial topics is increasing in the advent of Integrated Reporting <IR> but there is higher risk regarding the completeness and accuracy of the information – thereby subjecting to higher materiality concerns. Materiality analysis is time consuming and tedious with too many standards – especially crossing over external non-financial reporting and internal management reporting. (KPMG, 2016)

AI solutions have been incorporated that take control of benchmarking, materiality analysis and processes for monitoring non-financial issues in resource-efficient manner. The AI solution, for example, tracks 100 non-financial areas by sifting and then analyzes millions of data points from sources available publicly, such as corporate reports (financial and sustainability reports); voluntary initiatives; mandatory regulations and social media news. The NLP is used to derive meaning from human language and is added to data sources to extract comparable information. Through this, risks and reporting pattern is provided relevant to company. (Deloitte, 2016)

2.3 The Paradoxical Wave of Artificial Intelligence in the Accounting Profession

2.3.1 Positive Relationship – Opportunity Creator

Literature on relationship between AI and AP, in terms of AI positively influences AP through its '*opportunity creation*' and '*problem mitigating*' factors.



Literature on relationship between AI and AP, in terms of AI positively influences AP through its '*opportunity creation*' and '*problem mitigating*' factors.

The prime IV namely AI is broken down into 2 Leading IVs, namely Opportunity Creator and Threat Igniter. These 2 leading IV are further broken down into 6 minor IV's each, that make up the heart of these literature review. Thus, the following paragraphs shall critically identify, apply, evaluate, explain and justify all 6 minor IVs of AI as Opportunity Creator, based on review of literatures written by several authors.

First, **decision support**. Accountants lay decisions based on 2 thinking methodologies, namely, '*intuitive*' and '*reasoning*'.

ICAEW (2017) dictates regarding '***Intuitive***'- where quick and effortless thinking occur in unconscious and automatic manner, as the bodily system recognizes patterns based on what has happened before. This is supported by Plastino and Purdy (2017) depicting that this means, at these situations, no thinking is needed, as it is not something new that mind faces, but it is a repetitive action performed before, and the thoughts in the mind, know what response to produce. For example, accountants know, on spot, journal entry for 'cash purchases' is debit purchases and credit cash- which happens based on extensive experience, powerful, quick and flexible learning. However, intuition thinking is subject to 3 types of biasness:

- 1) **Anchoring**: previous suggestions and decisions strongly influence thinking
- 2) **Availability biasness**: generalize decisions on common grounds based recent thoughts and instances encountered
- 3) **Confirmation biasness**: only see things that match our liking, interest and view

ICAEW (2017) dictates regarding '***Reasoning***' involves critical thinking and inferencing aspects, at conscious mind state, under logical grounds- where extensive thinking and knowledge application is needed to make reasoned decisions- as mind faces something new and is not based on historical instances. For example, to lay down strategies for detecting material misstatements in financial statements. (Swarup, 2012) However, inferencing quality may lack accuracy without proficient knowledge and experience, and further jeopardize decisions with interference of intuitive thinking. (Vasarhelyi and O'Leary, 2016)

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According to Grove, Holder and Clouse (2018) and The royal Society (2017), the entire ‘thinking-methodology’ is transformed with integration of AI- where, at ***un-complex and lesser intuitive thinking situations***, AI replicates human reasoning aptitudes via inheriting accounting knowledge from experts through specialized encoding logic-based programming and uses it as regulation when suggesting decisions. However, at ***complex, ambiguous, rapidly-changing and high intuitive-thinking environment***, AI delivers analogous results to human intelligence by learning instructions via observing results of actions in past circumstances, happened previously; by studying intuition.

According to Greenman (2017) and Baldwin, Brown and Trinkle (2006), this way, AI is able to assist accountants in uncomplex environment delivering good inferencing results, whereas AI assist in technical decision-making under rapidly-changing multifaceted circumstances of material world- eliminating biasness that results from intuitive thinking; as every pattern of accountant’s intuition is recognized by AI, and is programmed not to follow biased intuitions Bobrow, 2019 and Yeoh, 2018). So, the decisions it suggests are impartial, unprejudiced and ideal for uncertain circumstances.

AI improves accountant’s thinking and help them make accurate and fair day-to-day decisions that not only allow achieving objectives, but solve unexpected issues of real world.

Second, **interactive learning and teaching accountants** grows from ideology of allowing machines to learn and perform specific tasks by inserting large amounts of data (Vasarhelyi and O'Leary, 2016). This is the functionality of AI gained from the biggest sub-set of AI, Machine Learning (ML) – a process by which machines learn from data.

For instance, a normal computer programme operates based on the set of instructions programmed in it. However, ML takes a different approach; rather than instructions, a set of guidelines on how to learn are programmed into it by encoding it within an algorithm. The algorithm improves its ability to operate- in a sense it learns; hence the term “machine learning”.

ML has the largest array of applications and functionalities that can most support the work of an accountant. It is known that major accounting practices have applied and are continuing to adopt ML techniques to streamline their operations in order to achieve time and cost reduction, increased productivity and improved accuracy. For instance, one of the Big Four accounting firms has deployed a system that could evaluate credit information related to a bank's commercial loan book, including unstructured data from social media. In this application, ML technology is deployed to establish forecasting models that, based on data from the past, generate predictions on identifying ‘problematic’ loan transactions.

According to Plastino and Purdy (2017) and Nilsson (2009), in accounting, the methodology of how chartered accountants and new experts work, is observed by men, and all data collected after this experiment, is transported into ML-empowered AI, in order for it to digest key traits of accountants. Once information is inherited, AI takes on job of teaching. Thus, machine learning displays “learning” and “teaching” qualities of AI and how it becomes useful assistance to AP. (O'Leary, 2014)

It performs heavy lifting of calculations, reconciliations and tedious work of examining, verifying and validating financial reporting information, on behalf of accountants. Also, managers need not fully be involved in training younger and less experienced accounting trainees, as AI knows how a trainee should work, and thus, commands and commissions relevant tasks to trainee as part of basic training and development process. (ICAEW, 2017 and MIA, 2018)

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The Royal Society (2017) supports and suggests that, AI also shows great assistance to new experts in their reasoning and inferencing module, by teaching them direct methodology to interpret, explain and justify, for example, audit evidence and teach them how to craft accurate and customized audit opinion in true and fair view. This not only saves an accountant's time but eliminates performing unnecessary monotonous and time-consuming tasks. (Wisskirchen, 2017 and Shukla and Jaiswal, 2013)

AI performs all tasks above by dictating knowledge and reasoning qualities it possesses through a specialized explanation module. For example, there is a malfunction for a correct double-entry, where transaction is entered using the correct amount and correct side, but in wrong class of account: motor expenses debited to motor vehicles account. (O'Leary, 2014)

Thus, AI, shall communicate to accountants, based on the knowledge it has, that, this is trial balance 'error of principle', and any expenses should be debited in expenses account and to correct this error, AI shows its reasoning steps, where, credit the amount debited in the motor vehicle account, and then, balance the account properly, and debit the amount in motor expenses account, and balance the account properly, with its balance, transferred to profit and loss account. (O'Leary and O'Keefe, 2016 and Vasarhelyi and Kogan, 2015)

This is simple scenario, how AI draws inferences based on knowledge it holds, and dictates accurate and practical solutions to problem. It also justifies how to reach to the solution and why only a particular decision was made to correct an accounting entry. (Aparaschivie, 2007)

Third, **intellectual capital (IC) and expertise storing.** According to Khurshid (2017), IC is an intangible asset that resembles company's main informational source; possessing capability to create and develop new product, maintain and attract new and existing customers and increase profits. It is the ultimate source that contains every possible confidential information regarding how company developed business improvements. (ICAEW, 2017 and MIA 2018)

According to MIA (2018) and The Royal Society (2017), thus, IC is an invaluable intangible asset that collectively improves corporate performance by delivering innovation ideas, value creation opportunities and enhancing employee's creativity. IC is composed of three efficiency elements, namely, '**human capital**', '**structural capital**' and '**capital employed**'. (Khurshid, 2017)

In accounting, different skillful actions that are in the form of 'intangible resources' may be secret formulations developed out of accountants and management's experiences. (MIA, 2018; ICAEW, 2017) For example, according to Smith (2016) and Hoque (2017), in the wake of integrated reporting (<IR>), leaded by South Africa, many other countries including Malaysia, are pledging to transform corporate reports into integrated version- which communicates organization's value creation story in a manner that engages its stakeholders, through <IR> framework of guiding principles and content elements; that extensively teaches company how value creation should be communicated while taking into considerations the 6 vital capitals available. (IIRC, 2013)

According to IIRC (2013) and Hoque (2017), despite, many countries are practicing <IR>, South Africa in line with ***King Code of Governance for South Africa 2009 (King III)*** requires all South African companies listed on Johannesburg Stock Exchange (JSE) to produce integrated reports under mandatory obligations which contained the principle that "the board should appreciate that strategy, risk, performance, and sustainability are inseparable" and integrated reports must be prepared to reflect this. However, SA's regulatory requirements are famously known to use 'apply or explain' approach, where, listed companies are given 2 choices, either they follow integrated reporting or properly explain why not; and if reporting is not performed according to King III or reasons not seem valid, companies are legally enforceable. (IIRC, 2013)

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According to Simnett and Huggins (2015), these mandatory requirements mean all South African companies must perform <IR>, and despite this, there are only 5 to 10 South African companies that on yearly basis, are being awarded "Excellent" for 'best practices' according to Ernst & Young's Excellence in Integrated Reporting Awards 2018- due to progressively achieving a higher level of adherence to the spirit of <IR>.

This shows that, there is something unique being performed by accountants behind the scenes, when crafting organization's business model, risk and opportunities, corporate governance and sustainability measure. These are actions that make them outstanding under '**human capital**', and should be preserved for organization's future success consistency. (Sofian, 2017)

This is when, according to Hovy, navigli and Ponzetto (2012), AI comes into the picture, where AI, through its algorithm setting can act as **knowledge management system** for organizations- where it would capture, store, retrieve and distribute secret and unique knowledge of accountants be it in the form of casebooks, manuals, rules, regulations and experience of experts. AI, shall, under '**expertise storing**' methodology preserve this information for future. In short, **IC shall be guarded by expertise storing.** (Sofian, 2017 and Smith, 2017)

AI becomes important in this context, as 'expertise storing' does not age, leave the organization and join competitor, become ill, retire or demand for higher salary. All of these instances cause organizations loose and distort IC, if purely depended on human storing. Thus, AI is ideal solution for accountant's IC, and in future ensure all IC is shared to potential new accountants in organizations- bring AP towards greater heights. (Nilson, 2019 and Radaceanu, 2017)

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Fourth, **digital management**. According to MIA (2018), accountants' worldwide fear regarding job security, as AI, within next few decades could replace AP. However, according to Greenman (2017), AI appears to be "changing" rather than "replacing" AP, because organizations and Chief Financial Officers (CFOs) are gearing towards 'maximizing benefits of AI' rather than 'allowing AI overpower them'. (Karen, 2018 and Wilson, 2017)

The theory is simple, Karen (2018) and Bughin (2019) suggests whereby "the creator is the controller, and failure to control, shall cause the creation to ignite threats". This means, the act of AI (creation) to overpower humans (creators) shall only occur if human allow this to happen, but, since human is the creator, he knows the nitty-gritty of AI, and holds power and authority to control AI to work in a way that aid and complement humans, not scrap them away.

According to Greenman (2017) and EY (2019), the act of human taking 'controlling actions' can already be seen, where organizations and CFOs are modifying business model with greater analytical view of utilizing big data and demanding for accountants who not only know traditional accounting and basic recording, classifying and summarizing data, but are equipped to do so, using technology. For example, AP is expected to contain accountants that are proficient with accounting software and have good exposure in data analytics, modelling techniques and advance Microsoft Excel.

Also, like the Big 4 (KPMG, PWC, EY, Deloitte) accounting firms that have embedded AI into their operations, within next decade, majority of accounting firms shall install AI, and expectation is, to have accountants work hand in hand with AI. (ICAEW, 2017 and MIA, 2018)

Thus, role of an accountant is changing, but it is not being replaced. The ideology is "someone has to manage all those robots in accounting- why not you"? As of 2018, in Southeast Asia, Certified Management Accountant (CMA) has taken great initiative in embedding 11 critical business practices in their training modules, that exactly trains accountants work side-by-side with AI, with accountants doing the 'managing' and not the AI. (Simon, 2018; CPA, 2019 and Aman, 2019)

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This shows how accountant's role and function channel towards digital management, which has its forte in maximizing the transformation opportunity that AI potentially provides. This shows how AP become collaborators of technology and advocates of change rather than passive users of software – clearly adding value to the *mondus operandi* of the AP.

According to Greenman (2017), in 2017, the US department of labor carried out an experiment to predict overall changes in number of accountants in AP- and the Bureau of Labor and Statistics reports declared that AP is expected to grow at rate of 11% over next 10 years. There were 2 reasons, retirement of baby boomer generation and rise in technological-driven accountants.

This shows, that the AP is at the verge of growth. At the advent of changing roles, traditional roles may become obsolete and new roles shall emerge – sufficient enough to have the longevity of the profession. It is just that, the changing roles, and the new roles emerging, has to be give importance and urgency for adoption. This is because standing still would be the biggest risk of disruption.

Fifth **data proliferation**. AP revolve around great amounts of data, from journals entries to ledger accounts, statement of comprehensive income, balance sheet, production of annual reports and today, integrated and sustainability reports. All these represent data that is vital to organization and accumulates yearly, as every year, business operational actions and performance change, and so data recording happens on continuous basis. (Greenman, 2017 and Wisskirchen, 2017)

Thus, Yaninen (2017) suggests that big data refers to more than just large amount of data that reaches high volume, verity, velocity and variability that makes accounting firms invest in system architecture, tools and practices specially designed to handle big data. In this context, AI represent one of the major tools to help accounting firms handle big data.

AI, through its algorithm setting, gains ability to process vast amounts of structured and unstructured data that accountants cannot reasonably process or even comprehend. For example, processing every element of financial regulations and accounting standards.

Also, according to Greenman (2017) and Luo, meng and Cai (2018), AI does great amount of work for ‘document review’ in accounting, where it reads through thousands of pages and filter out key terminologies. Previously this was done manually, but with AI being trained how to read intensive sample documents, great amount of text can be readable in short time. (Mannimo, 2015 and Sekaran and Bougie (2016) suggests that this not only saves time but allow accountants to concentrate in other important decision-making and managing areas.

This way, Nilsson (2009) observes that AI analyses and extracts insights from volumes of data and helps accountants make best use out of it. For example, in *financial reporting*, AI create and refine accounting standards to ensure AP present information to stakeholders in value-creation outlook that is dynamic and in real time; in *managerial accounting*, AI elevates efficiency and effectiveness of budgeting process by supporting the execution or transformation of companies towards beyond budgeting, and management control system; and in *financial accounting*, AI via the big data platform, increases relevancy, reliability and understandability of accounting information, which not only promotes transparency but allow stakeholders make better and value-contributing decisions. (O’Leary and O’Keefe, 2016)

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This section is clear example of how AI (a revolution) is able to collaborate with big data (another revolution) to help accountants manage, interpret and analyze large volumes of complex data in short and real time. AI is a coordination of machine learning, deep learning, big data and cognitive computing. These versatile aspects of AI allow it to be an ‘intelligent coordination tool’ that help accounting firms manage all new technological advancements. So, AP, as a whole, benefit from understanding market conditions, manage risk and make better forecast, with aid of AI.

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Sixth, **consistency and error reduction.** AP indulge in tasks requiring consistency (one of the main accounting principles). Consistency arises when choice of method is available. For example, there are several ways to calculate depreciation of non-current asset such as reducing balance, straight line and sum of years digit method. Thus, one with most realistic outcome should be chosen and constantly used from one accounting period to the next. (Vasarhelyi and Kogan, 2015)

However, there are many instances, where this may not be practiced, making comparison of financial results from year to year, impossible; further distorting profits for particular years. (Grove, Holder and Clouse, 2018)

Thus, with AI, applying same depreciation method can be programmed through algorithms and it can help AP make clear comparisons.

This consistent decision-making from AI is possible as they escape from tiredness, boredomness and biasness. They improve accountancy via eliminating cognitive biasness.

Also, according to Plenert and Kaiser (2017), on a general viewpoint, accounting is subject to many human errors, for example trial balance error, recording, classifying and reporting errors. However, AI is non-human and thus, if programmed by great experts, can improve accounting with no errors. This means, financial statements and material misstatements can be presented at zero material misstatements quality.

This provides full transparency to stakeholders and external auditors, without the need to blame auditors for their inherent risks. This allows stakeholders gain more confidence and make better decisions, whereas, external auditors can concentrate in correcting and validating preparation and presentation of organization's corporate and integrated reports.

The idea is, with AI, consistency and elimination of errors allow accountants and auditors to shift attention to improving other matters in organization.

2.3.1.1 Analytical Statement on Role of AP

Based on 6 minor IVs of ‘**AI as Opportunity Creator**’ on Accounting Profession as identified and justified above, it clearly shows how AI is advantageous towards AP and allows the profession to **enhance in their expertise** by leap and bounds.

This is because, according to Shabbir and Anwer (2015), AI, through its **sophisticated** and **differentiated**, rather **customized programming** is able to perform **several tasks** and **roles** of the accountant, that indirectly make **accountants credential** experts whom focus on more **important decision making** areas in organization. (MIA, 2018)

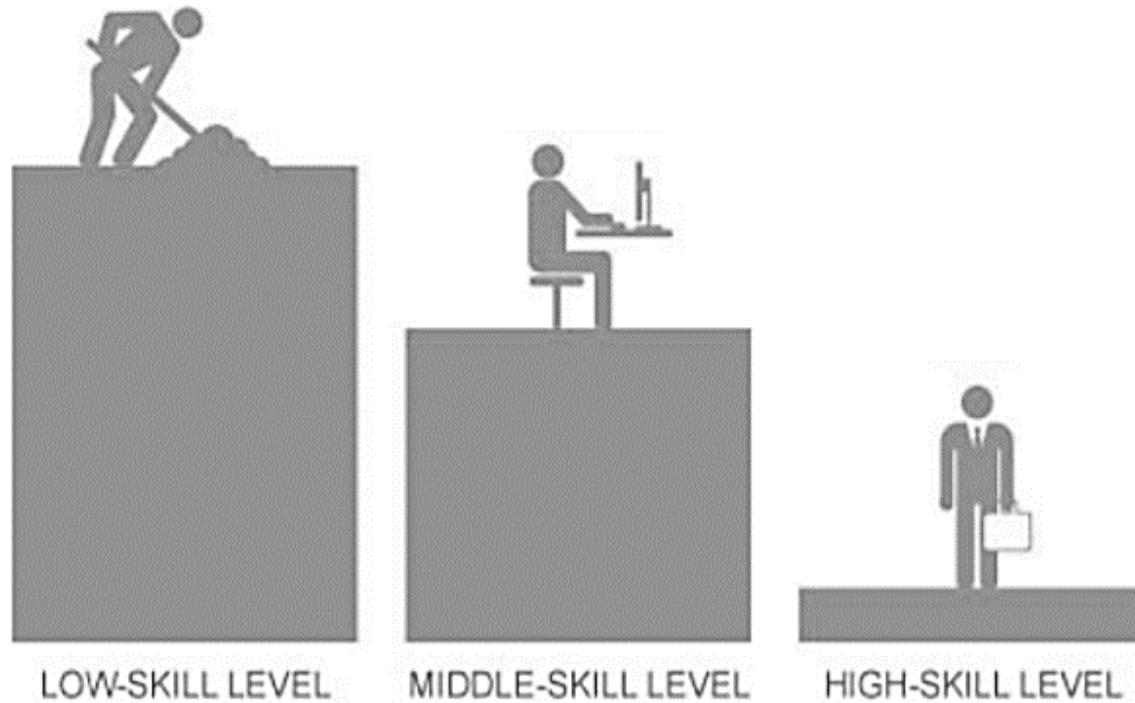
This relates to ideology of individuals of **AP embracing AI** – where there is an **assertion** that they might **grow** with slightly changed **new roles**. It can be evaluated, through this AI and AP relationship, **continuity** of AP could be established – where this can only be accurately discovered based on **significant level** of opportunity creating influence of AI on AP. This is performed through **further research** in this investigation. (Bughin, 2019 and Wilson, 2017)

2.3.1.2 Risk on Role of AP

The **opportunity creating** side of AI on AP is all about **enhancement, extinction and birth** of new roles for AP, as it is at that point, where **humans** and **machines** are **collaborating** to work together. Thus, it is obvious, **change is roles** have high chance in occurring.

However, to investigate whether AI shall **change role** or **completely replace role** of accountants is **debatable** and needs **further research**, which shall be performed at later stages in this investigation.

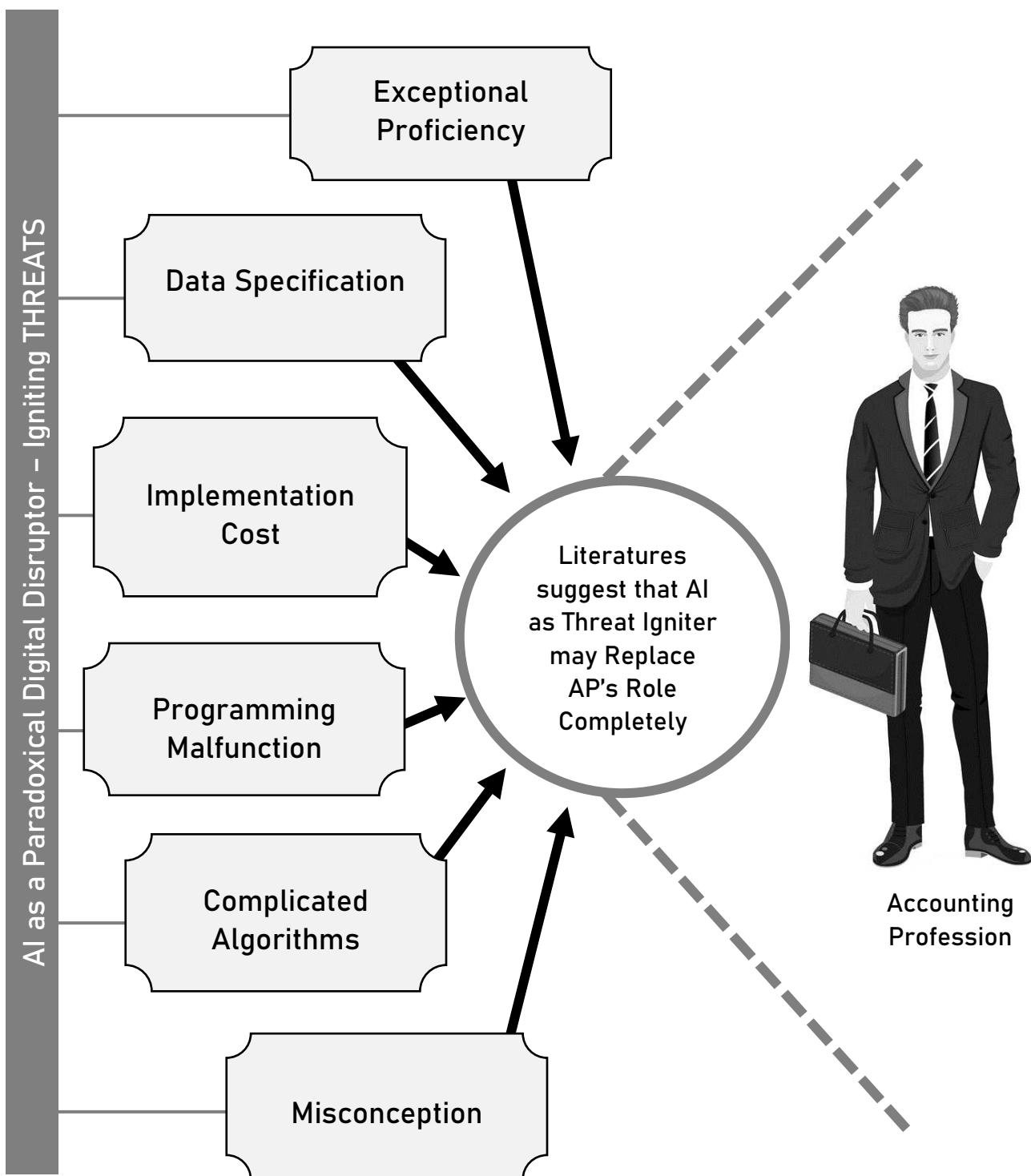
According to Yaninen (2018), roles of accountants shall be influenced based on their skill and expertise levels. Yaninen (2018) shares that there is higher likelihood of accountants from low **skill levels** to be affected, followed by **middle-skilled level** and accountants least affected would be **high-skilled level** accountants.



Source: Yaninen, 2017

2.3.2 Negative Relationship – Threat Igniter

Literature on negative relationship between AI and AP, in terms of AI destructively influences AP through its '*threat igniting*' factors.



Literature on negative relationship between AI and AP, in terms of AI destructively influences AP through its potential ‘*threat igniting*’ factors.

The prime IV namely AI is broken down into 2 Leading IVs, namely Opportunity Creator and Threat Igniter. These 2 leading IV are further broken down into 6 minor IV's each, that make up the heart of these literature review. Thus, the following paragraphs shall critically identify, apply, evaluate, explain and justify all 6 minor IVs of AI as Threat Igniter, based on review of literatures written by several authors.

First, exceptional proficiency. “*Will AI replace AP*”? “*Will accountants lose their jobs*”? These are examples of questions haunting every potential accountant and existing chartered accountant’s minds, in the accounting and finance industry. There are several opinions of researchers regarding this matter, however, it is still a question no one can accurately answer, as how the AI evolution shall transform the future, is closely unpredictable. In this proposal, this is the ‘research gap’ in terms of ‘what is not known’, leaving this study on debatable grounds. (ICAEW, 2017 and MIA, 2018)

According to Radaceanu (2017) and Yeah (2018), the new developments and innovation upon AI are increasing number and quality of functionality in AI, making it more versatile in solving myriads of problems – thereby making it tap exceptional levels of proficiency. Thus, with its escalating proficiency that is driven by accuracy, efficiency and effectiveness, it performs accounting tasks like recording, classifying, summarizing, interpreting, analyzing and delivering opinions, way better than human accountants. These are the attributes demanded by the profession, and if AI delivers it effortlessly, there are high chances AI comprehensively taking over AP in near future.

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ICAEW (2017) and Yeoh (2018) preach, AI is quick, reliable, does not get tired or stressed, with ability to give real time solutions and explanations in terms of how and why it crafted that specific solution. It possesses learning and teaching attributes, which is going to cause accounting labor market uprooted on scale never seen in industrial revolution. This could increase income disparity, with drastic falling incomes and escalating unemployment in large segments of accountant's population (Shukla and Jaiswal, 2013). Therefore, with advancement in technological supercomputer and creative inventions of algorithms aspects towards AI, the AP can be anticipated to vanish.

However, it is not that, accountants would not be needed, instead, they will be demanded for managing and operating AI, and not doing what an accountant's job description tells todays. This is because, AI requires programming and someone to facilitate and order work to be done. Thus, accountants shall perform 'managing part'. Indirectly, this defeats the purpose of an accountants and could reduce employment, as only a handful shall be needed to perform 'managing'. Thus, it can be clearly evaluated how AI threatens AP.

Second, **quantity and quality of data**. Mijwel (2015), Nilsson (2009) and Baldwin, Brown and Trinkle (2006) evaluate that AI studies something through “machine learning”- by feeding large volumes of data; and, “deep learning”- which expand neural networks to sprawling networks which are in layered form, to transmit great volumes of data into AI. Neural networks are brain-inspired networks with multi-layers of algorithms interconnected, called neurons. These connections transmit data into one another till the AI gets trained to carry out specific tasks.

Despite this intricate training and learning methodology, it all depends on the quantity and quality of data.

Quantity: According to ICAEW (2017), it is easy to get data in large volumes and simply feed AI with all possible data available. The AI shall read and study the data, but it shall not customize AI to learn and teach something specific. This is because, to obtain accurate and useful output from AI, the need of ‘right and appropriate data’ is needed. This requires filtering data before projecting it into AI. This can be very time consuming, and if right data is not inserted into AI, the solutions suggested by AI shall be vague, irrelevant and absurd. This can mess accounting data and lead accountants to take wrong decisions, which may negatively impact value creation and confidence of stakeholders. (Wisskirchen, 2017 and Simon, 2018)

Quality. The excellence and superiority of data shall increase, if the quantity is reduced, and filtering is done well. Then, only most important and needful data shall be fed into AI. ICAEW (2016) argues that, however, often accountants have trouble distinguishing relevant and irrelevant data, as, they are unsure about future problems that organization might face where AI shall be used for solutions. Also, greater percentage of data might contain biasness and prejudices. Thus, although lesser volumes of data be inserted into AI, the outcomes could be far less useful for accountants. (Bobrow, 2019 and Plenert and Kaiser, 2017)

Inserting data may seem an easy process, however, it requires large training data sets and expertise in drawing connections between millions of data points. If the algorithms are not performed correctly, it defeats purpose of AI. (Shukla and Jaiswal, 2013)

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Despite correct algorithms are programmed, AI produces suggestions based on mathematical calculations, which are all predicted based on knowledge inserted in it. It lacks ethical and professional skepticism attributes, which may not help AP; as not all solutions could be resolved in this way. (O'Leary, 2014 and Vasarhelyi and O'Leary, 2016)

Moreover, O'Leary (2014) and Baldwin, Brown and Trinkle (2006) argue that AI omits to think differently and deal different problems uniquely, as, the solutions it suggests, is purely based on data inserted in it. Thus, often, different problems may be granted similar solutions.

Thus, machine and deep learning is highly dependent on expertise in data insertion into AI, if not, AI shall be a threat to AP. (Wisskirchen, 2017 and Miranda and Aldea, 2016)

Third, **implementation cost**. Mannino (2015), Greenman (2017) and Plastinon and Purdy (2017) dictate that the manner in which AI adopts and executes its various functionalities showcases how tedious and intricate it is to design, manage and operate it. Thus, the creation and usage of it can be extremely expensive due to complex nature and need for repair and ongoing maintenance. Also, fees for AI may be increased due to supplier's legal and regulatory copyright brand. Thus, it causes accounting firms to rethink their business models to reduce the disadvantage of financial impact on value creation.

This aspect of AI particularly refer to AI machines that are developed in accordance to customization for a particular area in accounting, just like how Deloitte developed TAX-I for tax regulations, GRAPA for audit risk and DocQMiner for contract analysis. Basic software and machine empowered by Robotic Process Automation (RPA) and chatbots may not be very expensive. Regardless it resembles some form of cost that should be budgeted.

However, in this context, the adoption and implementation cost refer to the customized AI machines. This is because implementation of AI in accounting has begun with AI being used sophisticatedly in different areas of accounting, rather than generally.

This aspect of AI poses a threat in industry as not all accounting firms and accounting departments in organizations shall be able to afford AI. Probably, only the large accounting firms like Big 4 - which are currently building their own AI-empowered machines in audit, tax, forensic and advisory areas. This is possible as large firms are backed with stable funding for their research and development (R&D).

This causes disparity in execution of accounting tasks, in terms of its efficiency and effectiveness, as AI makes accounting more 'efficient' with its ability to repeat processes and tasks quickly, completely and consistently; and more 'effective' with its ability to process, structure and analyze large amounts of data. While some accounting firms benefit from this, the rest will still be dealing with highly routine processes, rule-based elements of judgments, large amounts of information to be considered on consistent and thorough basis and occasions of human biasness. So, technically, the quality of accounting and finance services delivered shall differ vastly because the AI-empowered firms could dedicate more time towards strategy development and service improvement when the without-AI firms are tangled with repetitive workload data proliferation. (Greenman, 2017 and Chukwudi et al., 2018)

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Moreover, O'Leary and O'Keefe (2016) argue that dealing with AI requires organizations to send accountants for further training pertaining digital-management, algorithm encoding, data analytics and data science. This become additional cost that often, not all firms may want to spend, due to low budgets for training and development.

Often, this channels the profession not to embrace AI – thereby being left backward. However, it is imperative to understand that AI is a digital technology that falls under the investment category of expense as it fosters survival and assists one fit into the new norm of disruption, for a long period of time, probably till next wave of disruption. The capital budgeting for AI reveals high initial outlays but high cash inflows in long-term, which positions it fairly favorable. Thus accounting firms must begin planning and budgeting for these costs whilst allocating new reserves under the idea of 'digital collaboration', in order to automate, assist and augment accounting processes, if not now, at least in the near future. This funding is an investment funding that is necessary for firms and the AP as a whole, because standing still would be the biggest threat.

This shows how adoption and implementation cost of AI in accounting areas is a bottleneck towards enhancement and transformation of the AP, but AP is still at the position to undertake the necessary measures as mentioned above, to sustain the longevity of the profession.

Fourth, **programming malfunction**. AI has high levels of uncertainty, where operators have fear, if AI abruptly malfunctions, despite its effortless aspect of performing specific accounting tasks.

Upon its malfunction, AI not only needs expert repairing, but, to check if data inserted in it could be retrieved. At many instances, AI fails to keep up with its memory, and large amounts of data and data analysis performed could be loss. (O'Leary and O'Keefe, 2016)

According to Wisskirchen, (2017) and FRC (2018), if the accounting firm's operations, such as KPMG's audit engagements are high dependent on AI, then it could distort ability to proceed with such engagements. Vital analysis performed could halt audit work performed for client. This can cause delays in carrying out audit test and collecting audit evidence- further jeopardizing audit opinion in accurate, true and fair view.

Furthermore, malfunctions may require changing of certain vital components of AI, and resetting algorithms. This may cost a big amount to organization, causing problems in maintaining financial stability. (Wisskirchen, 2017 and Bughin, 2019)

This factor can be major threat in advisory section of AP, where failure of AI may limit number of creative and innovative suggestions to clients in solving their problems. This is because there is vast difference between suggestion from AI and human capacity of intelligence.

Fifth, **complicated algorithms**. It is anticipated that in future, if AI do not replace AP, accountants shall handle “AI management”.

Despite accountants are urged to be tech savvy, managing AI is not something that requires keying in journal entries into accounting software and then analyzing results the software produces. Dealing with AI requires high levels of knowledge and expertise in data analytics probability, statistics, algebra, calculus, algorithms and data science, computer science, biology, psychology, linguistics, mathematics, and engineering. (Swarup, 2012 and Wisskirchen, 2017)

For example, accountants shall be engaged in training and testing models, or auditing algorithms to analyze problems and integrate results into business processes. Also, accountants may be directly involved in coordinating inputs and outputs, like exception-handling and preparing data. This is not something an accountant studied for. It may be a complete change to typical role of an accountant.

Plastino and Purdy (2017) and MIA (2018) add that this evolution will be reflected in the skills required of accountants. Some roles, such as training models, may require deep knowledge of machine learning techniques. In other areas, accountants may just need a more superficial knowledge of machine learning to be able to have informed conversations with experts and other parts of the business.

This is jeopardized especially when complexity of the models pose a barrier to the explanation of how results were derived without understanding the rationale of each algorithm put in place. This is because accountants, form the receiving end would have no clue how ML was developed and implemented, from the ‘training’ to the ‘processing’ of data – which further manifest doubts pertaining reliability of results generated by ML and AI.

Thus, AI becomes difficult to use and manage. In these cases, accountants reject form using the system. This way, the threat ignited by AI leads AP to take a step back from embracing AI, thereby having their roles and positions easily replaced in near future – eventually jeopardizing the longevity of the profession. (ICAEW, 2017 and Shabbir and Anwer, 2015)

Sixth, **misconception** between ‘when to use professional judgment and when to rely on AI. “*Are we moving into low sense of belonging paradigm?*”? ‘*Are we reducing interaction between employee and business*”? *Are we moving into an environment that is ideal for accountants*”? These are some of the many questions debated today.

According to MIA (2018), AI is an unnatural persona that does not inhibit original creativity, moral values, interaction and emotions. Thus, they are merely agents that perform what is programmed. They act similarly to every situation and cannot make judgment of right or wrong at unfamiliar situations.

In an accountant’s lifestyle, at many instances, it is important to uplift ethical and practical aspect when making decisions, in order to deliver fair and understandable interpretation regarding value creation. Also, professional skepticism is practiced to go beyond what is immediately apparent from usual sources and opinions available, to question facts for better justification and evidence; and challenge information in professional and courteous manner at wider professional, ethical or public interest. (Lu, Meng and Cai, 2017 and Simon, 2018)

These are attributes that humans possess out of natural universal creation, and even if replicated, AI is unable to showcase these aspects, as perfectly as human does.

This shortcoming of AI disrupts interactions and sense of belonging among AP, as accountants are seen to work with AI in future. There is nothing like working with a whole heart or passionately, as care or concerns are not present in AI’s dictionary. There is no sense of belonging, togetherness and human touch. They fail to distinguish between a hardworking individual and an inefficient individual. (Greenman, 2017) It shows how human is not given an ideal organizational environment to survive and grow as a proficient and ethical accountant. Indirectly AI distorts the social behavior of Accountants. (Baldwin, Brown and Trinkle, 2006)

Due to this, Nilsson (2009) and ICAEW (2017) suggests that often accountants fall into dilemma of when to use professional judgment and when to rely on AI’s results. This happens at instances when professional skepticism should be used but solutions provided by AI confuses accountant whether to probe, question and challenge ‘ethical’ facets or follow so called ‘accurate’ results of AI. This not only consumes time, but lead AP to forget their original creative ethical and moral behavioral characteristics. (Simon, 2018 and Duffy, 2018)

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The ideology of AI and ethics relates to the intervention of AI that compromises human well-being. This means the decision and actions taken and suggested by AI can place accountants in a position that compromises the 5 fundamental ethical principles that every account should follow at all times – integrity, objectivity, professional competence and due care, confidentiality and professional behavior. It is the potential ethical compromises that may result from decision making by an algorithm.

The following are 3 ethical challenges posed by AI that threaten accountants: -

Discrimination and biasness. Although AI help accountants tackle biasness, the algorithms programmed are not always neutral and well intentioned. Thus, AI can become discriminative and biased, that not only confuse but mislead accountants.

Trust. The data that is fed into AI with algorithms encoded for learning to take place and the output delivered by AI for decision making can cause trust issues – in terms of whether there is transparency between the algorithms, machine learning and decision-making code. If the decisions suggested matches the decision-making code of accountants, then the AI can be trusted, if not the data and algorithms cannot be trusted.

Assigning Accountability. At several instances, the algorithmic decision followed by the accountant may be incorrect or probably inaccurate. This may cause problems in the situation the decision had been made into. Thus, questions arise as to who is brought to be accountable in this situation? Who takes responsibility for the consequences of decisions made, the human professional accountant or the algorithm? Dealing with this clearly and consistently must be key focus for because the risk otherwise is that the technology will take the credit when things go well, and humans will take the blame when things go wrong – creating a no-win situation for those trying to work with the technology. An important principle cited by many experts for ethically sound AI solutions is that those solutions should be designed in a way that does not alter the patterns of accountability that have been established by society, culture and law. This aspect of AI demand accountants to become moral agents that are vigilant towards the decisions suggested by AI, in terms of whether they are within the ethical boundary. This requires attempt to anticipate possible courses of actions that an AI might possibly take and encode rules that bound the system to take ethical actions only. Also, it requires to deal with more open-ended AI system that gathers information, predicts consequences of its actions, and customizes ethically acceptable responses.

2.3.2.1 Analytical Statement on Role of AP

Based on 6 minor IVs of ‘**AI as ‘Threat Igniter’**’ on Accounting Profession as identified and justified above, it clearly shows how AI could potentially be **disadvantageous** towards AP in terms of **overpowering** existence of accountants due to ability of **replacing** most of the roles of accountants and performing tasks far beyond accuracy and quality of that performed by accountants.

Thus, Karen (2018) and EY (2019) suggests this ignites tendency of AI **completely replacing role of AP** as individual of AP may begin facing situation of their **need** in industry becoming **insignificant** till experiencing **loss of job**. This is ultimate **assumption-based contemplation** of AP losing jobs as a **consequences** of AI **threatening** accounting and finance industry.

This ideology draws attention to position of AP individuals being **victims of AI** probably due to **failure to appropriately embrace** AI or **failure to compete and keep up** with AI’s disruption. Therefore, if assumption of job loss comes true, accountants shall be in position of needing to deal with **new jobs created by AI** (as opposed to new roles created by AI in the AI as opportunity creating situation). (Wilson, 2017 and Bughin, 2019)

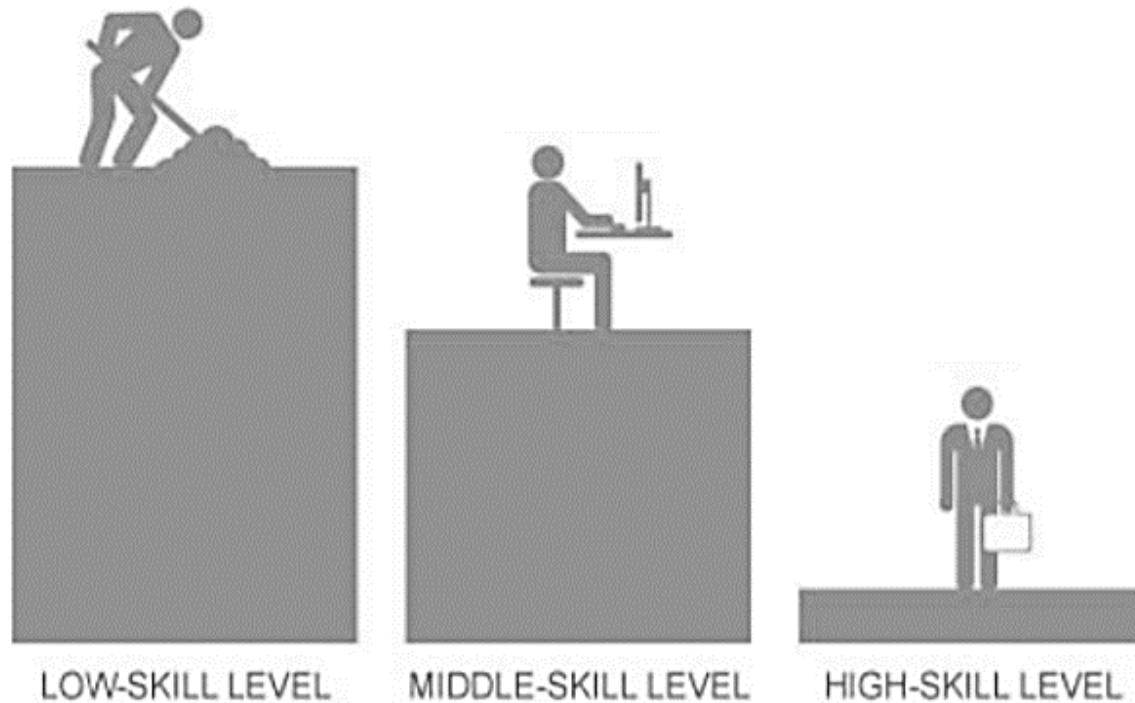
At this unfavorable situation, Simon (2018) and CPA (2019) suggests that it can be assumed that **continuity of AP shall be halted** as it amounts to drastic modification on the role and job scope. Ultimately, Bughin (2019) adds that it could lead to ‘**Rebirth of the Profession**’ – with **new roles, jobs and expertise**, in areas that need the **human touch**. It can also be an area created by AI that needs the human touch and true nature of human mind.

However, this entire **assumption-based articulation** dictated by researcher can only be accurately discovered based on **significant level** of threat influence of AI on AP. This is performed through **further research** in this investigation.

2.3.2.2 Risk on Role of AP

According to MIA (2018) and Robert (2017), the **threat igniting side** of AI on AP is all about gradual extinction of AP and **birth of new profession** for people affected by AI's industry wide disruption. It can be said, it is that point, where **human and machines failed to collaborate together** due to machines far exceeding knowledge and expertise of AP. However, to investigate whether AI **shall change role or completely replace role and replace AP as a whole** is **debatable** and needs further research, which shall be performed at later stages in this investigation.

According to Yaninen (2018), roles of accountants shall be influenced based on their skill and expertise levels. Yaninen (2018) shares that there is higher likelihood of accountants from **low skill levels** to be affected, followed by **middle-skilled level** and accountants least affected would be **high-skilled level accountants**.



Source: Yaninen, 2017

2.4 The Tech-Embracing Abilities

The wave of disruption navigated by AI creates opportunities and ignites threats simultaneously – impacting AP in somewhat a neutral manner. Thus, the level of impact whether more positive or negative is in the hands on Accountants based on their ‘embracing ability’ or in other words, ‘disruption potential’. In other words, it refers to the efforts and actions taken by Accountants to embrace, adopt, extend and integrate AI as a technology.

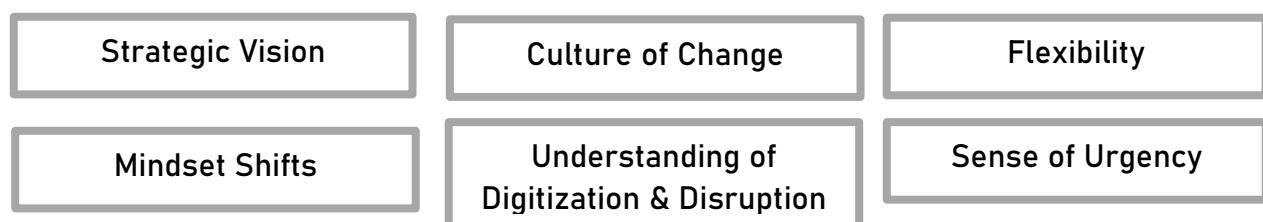
It is imperative to identify and investigate this area because there is a growing disconnection between technology potential and its adoption across the profession – popularly due to the widespread misunderstanding of the transformational opportunity digitization potentially provides (KPMG, 2016 and Deloitte, 2018).

The following are 6 essential elements (amongst the many) that bridge the gap between the disconnections that is occurring. They are critically evaluated in the literature below and shall be used as measures for identifying the level of influence of AI on AP in the data collection.

If Accountants are adhering to these elements strongly, then AI have a positive impact on the AP – thereby recognizing accountants as embracers of AI, if not Accountants shall be observed as victims of AI. This is because the greatest risk in disruption is to stand still.

The doctrine of Tech-Embracing Ability preaches that the level of positive and negative influence of AI on AP is likely to be decided based on the tech-capabilities of Accountants. This means the accountants have to have these 6 (at least) capabilities in order to ensure they are on-track and have strong readiness towards embracing digitalization and AI, and if they have, it means they are to embrace AI and are likely to enjoy a positive impact, thereby having AI to have a higher degree of positive and favorable, opportunity-creating influence on AP, rather than adverse, threat-igniting influence.

There are 6 TEA in adopted in this research. They are: -



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First, **strategic vision of digitization** fosters the importance of crafting a sophisticated strategy specially to address the intervention of digitization in AP, Accounting firms or even specific areas in Accounting and Finance. This means, to pave the path for digitization to enter the industry and in the functional area of Accountants rather than it entering haphazardly (Ford and Lobo, 2017). Developing a clear strategic vision preaches on identifying and explicitly understanding the nature of AI revolving around the profession's ecosystem and subsequently integrating it into strategic planning. This is to investigate the disruption is likely to occur and what AI specifically has to offer to the AP and areas in Accounting and Finance (Deloitte, 2016). This invites strategic and integrated thinking in charting the possible transformation to business model and strategic objectives. This way, there is a step forward towards planning and formulating before implementing a sophisticated digitization strategy. It is a pilot kick-start to observe the impact of AI and whether there is sufficient executive leadership to drive this digital change and eventually develop and implement it as a company-wide strategy. (Pan et al., 2017)

Second, **flexibility**. This is the action of eliminating rigidity and moving out of comfort zones. An initiative in starting a transformational momentum – thereby making it a norm. This is because with venture of AI, every interface with it introduces something new and thereby continuously bringing changes (KPMG, 2016). Thus, charting a 3 to 5 years digitization with AI roadmap would be of no use as it would be obsolete before implementation after looking at current pace of technology advancement moving at unprecedented breath and scale. So, flexibility is the power to move with the flow of AI while working towards long-term strategic vision. (KPMG, 2016)

Third, **dwell in a culture of change**. To move into a phase where change is a norm. This means adjusting to something new and adopting it at a consistent and continuous pace at an intensity equivalent to becoming a habitual practice. When an action becomes a habit, it becomes part and parcel of an individual's personality – thereby granting them without the need to take efforts to embrace change when it is demanded, because the individual has already created it as his new norm. Painting this culture of change is an action way higher in priority than adopting AI and digitization. This is because what is constant today is change, and what is certain is uncertainty. To develop such an innovative culture, a comprehensive program that promotes innovative behaviors in a holistic fashion across the organization may be required. This should start with the human capital function and organizational talent development programs. (Ford and Lobo, 2017)

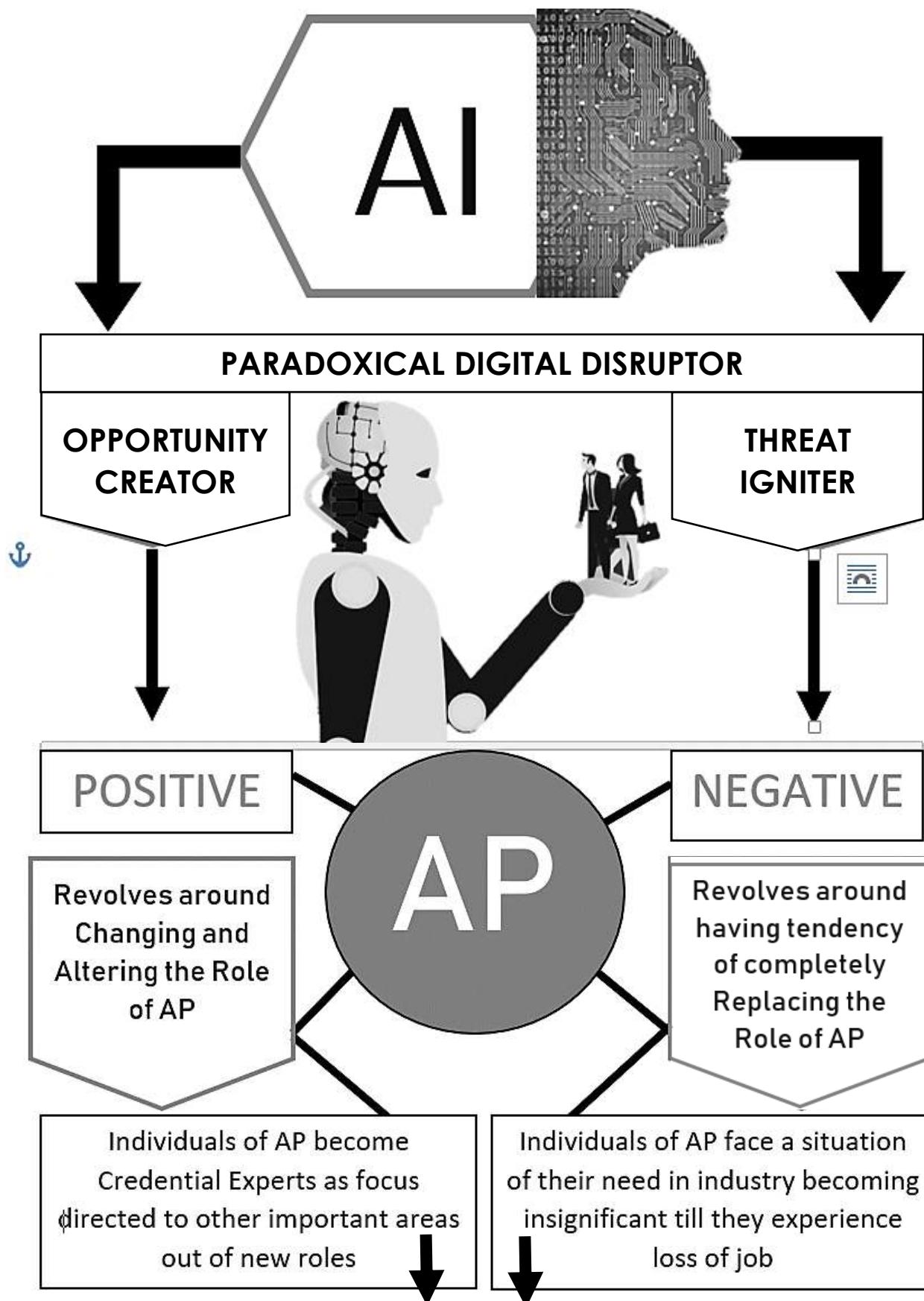
Fourth, **accommodate mindset shift.** The prime objective is to get accountants become advocates of change and not just passive users accounting software. This needs a drastic shift from ‘looking digital’ to ‘being digital’ which demands for a mindset shift. The following are 3 essential theories in fostering the much needed paradigm shift to fit into the new norm of disruption created by AI.

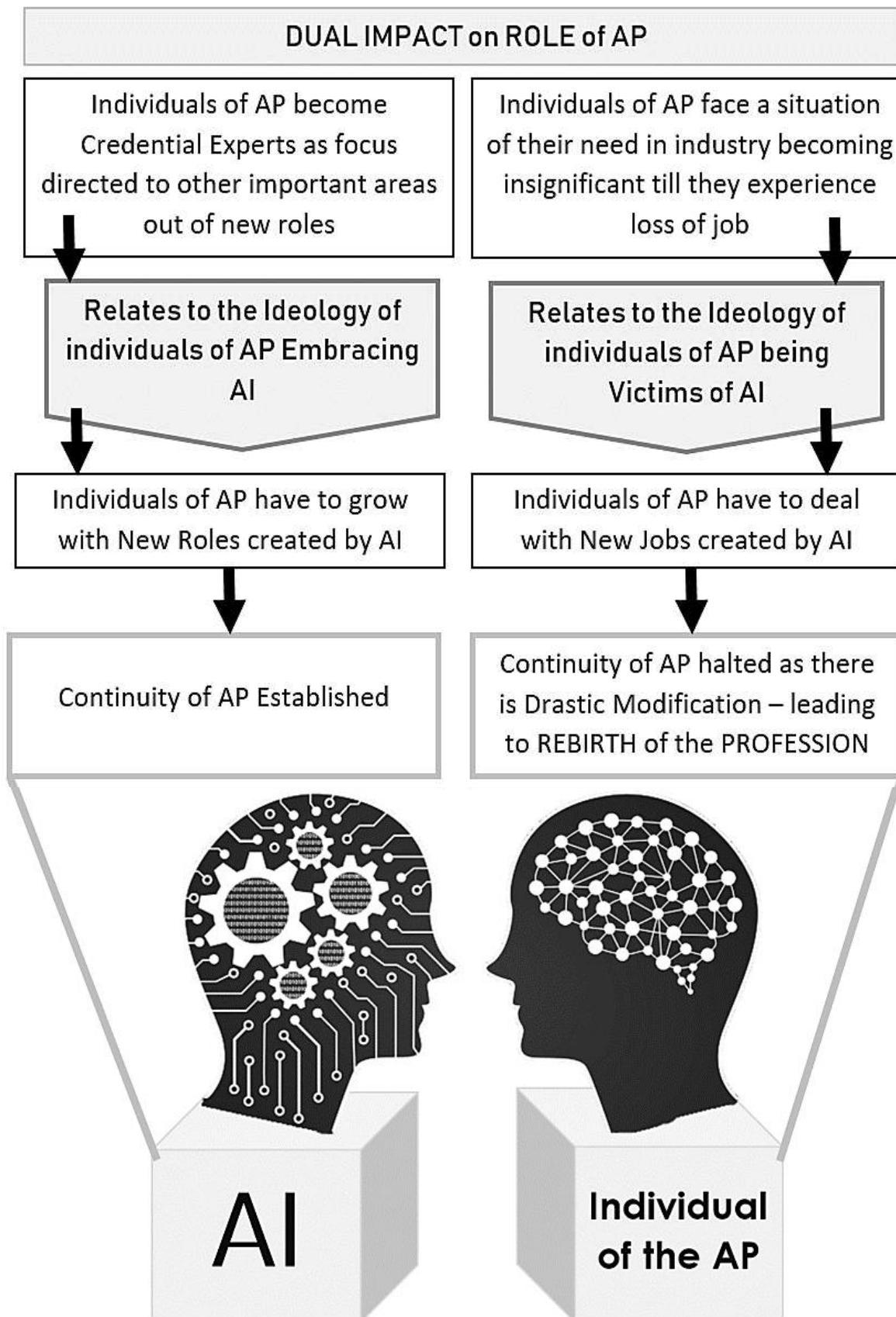
- 1) ***Disrupt or be disrupted.*** The emphasis is on fostering disruptive thinking – programming the mind to ignite genuine ability and willingness to change and reject tried-and-tested ways of creating value. This releases the mind from being tangled to fear that digitization and innovation adopted by others shall cannibalize survival opportunities. It is at this point, the set of mind takes a leap towards initiating the disruption by welcoming the force of AI rather than being disrupted. (Pan et al., 2017)
- 2) ***Redefine business strategy.*** The AP must revamp their strategies for major innovative disruption. However, before taking drastic actions, it is imperative to ponder upon existing strength and capabilities of the firm and accountants in order to formulate customized strategies relevant to re-design and radically improve the state of the profession. This is so that digitization ventures into areas that automation works best, thereby maximizing the efficiency and effectiveness of profession. (Ford and Lobo, 2017).
- 3) ***Establish agility and experimental mindset.*** The emphasis is on being nimble with an open mind entertaining success and failure. This is because the venture of AI into the profession itself is a major experiment where assertions and integrated concepts shall be at a continuous test to ascertain how AI can be the best fit. For this, the profession must find comfort in trial-and-error and success-and-failure to ensure lessons can be learnt from failure and collaborated with successes to maximize the aid of digitization. The profession must begin with the end in mind, but the ‘end’ not being the outcomes it desires but the benefit it aspires. This will be a good kick-start towards agility and experimentation paradigm. (Ford and Lobo, 2017)

Fifth, **understanding of digitization and disruption.** The momentum of understanding becomes resourceful when there is interest and importance given towards scraping out true meaning and nature of a particular subject matter. However, this is often driven by strong sense of desire and strength to make an effort which highly depends on the individual and how profoundly the vision of digitization is communicated (Ford and Lobo, 2017). Thus, accountants must make effort towards gaining a basic understanding of digitization whistle the AP clearly communicating the vision of digitization, rather than just knowing digitization and disruption through rumors and thereby contributing to greater misconceptions. This is in order to gain knowledge, tap awareness, bring changes in their conduct and eventually know the magnitude of transformational opportunity AI potentially provides (KPMG, 2016). With this, misunderstanding and misconceptions vanish thereby moving the AP away from risk obsolescence. Limited or no understanding shall halt the profession's travel towards transformation – leaving them laid back. (KPMG, 2016)

Sixth, **sense of urgency.** Based on the Sean Covey's 4 quadrant 'Urgent-Important' matrix, the need to embrace AI falls under the first quadrant of 'Urgent-and-Important'. Thus, accountants must address the disruptive force of AI as both urgent and important – thereby placing it at highest priority (Ford and Lobo, 2017). This means to understand, learn and adopt it at a fast pace to be on par with the pace at which technological advancements are occurring and capitalize potential gains before opportunities are eroded (Pan et al., 2017). Often, the attempts to embrace and adopt AI as a response to disruption happens at a very low intensity especially when there is no urgency and importance channeled towards it, thereby leaving individuals far backwards – struggling to recognize and survive disruption. However, with urgency, there is a passion to thrive and maximize the use of transformational opportunity. (KPMG, 2016)

An Extensive Visual and Theoretical Articulation of the Literature

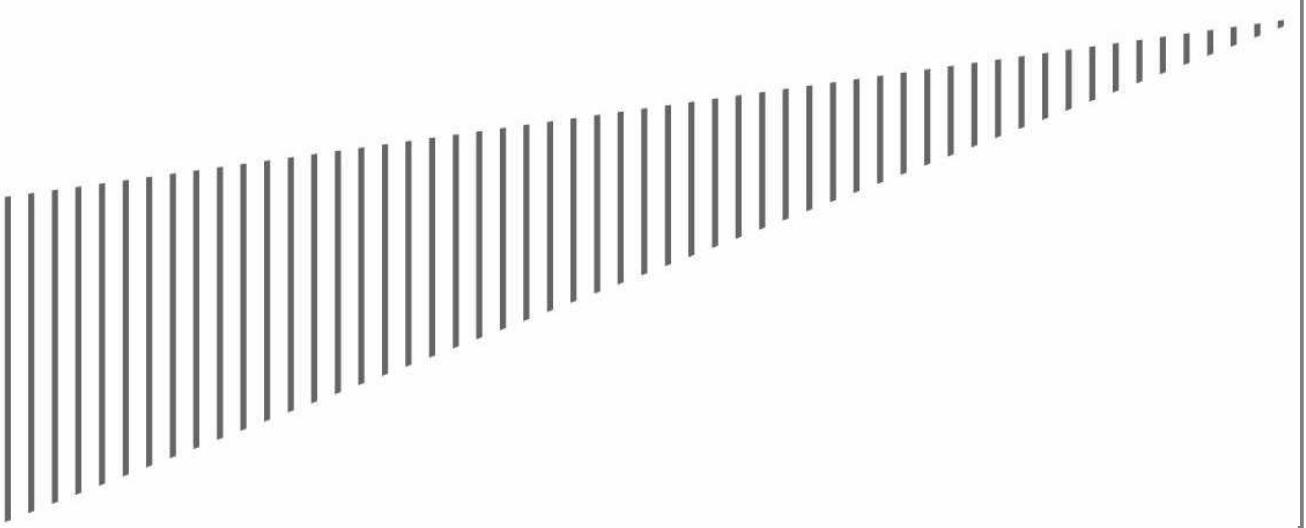






CHAPTER 3

RESEARCH METHODOLOGY



DOCUMENT FLOW

For this Section Only

3.0 Introduction

3.1 Mixed Method Study

3.2 Mixed Method Point of Justification

3.3 Mixed Method Philosophy

3.4 Mixed Method Theoretical Foundation

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3.6 Mixed Method Approach to Design

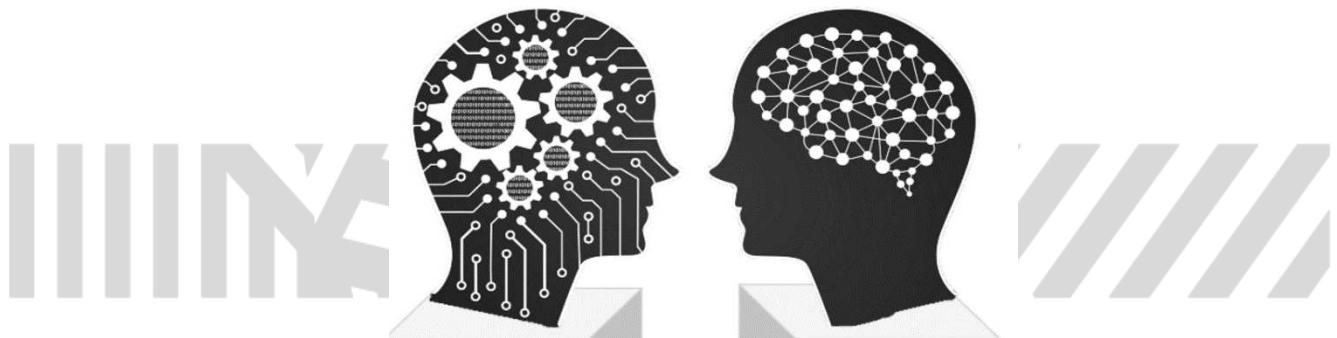
3.7 The Convergent Parallel Design

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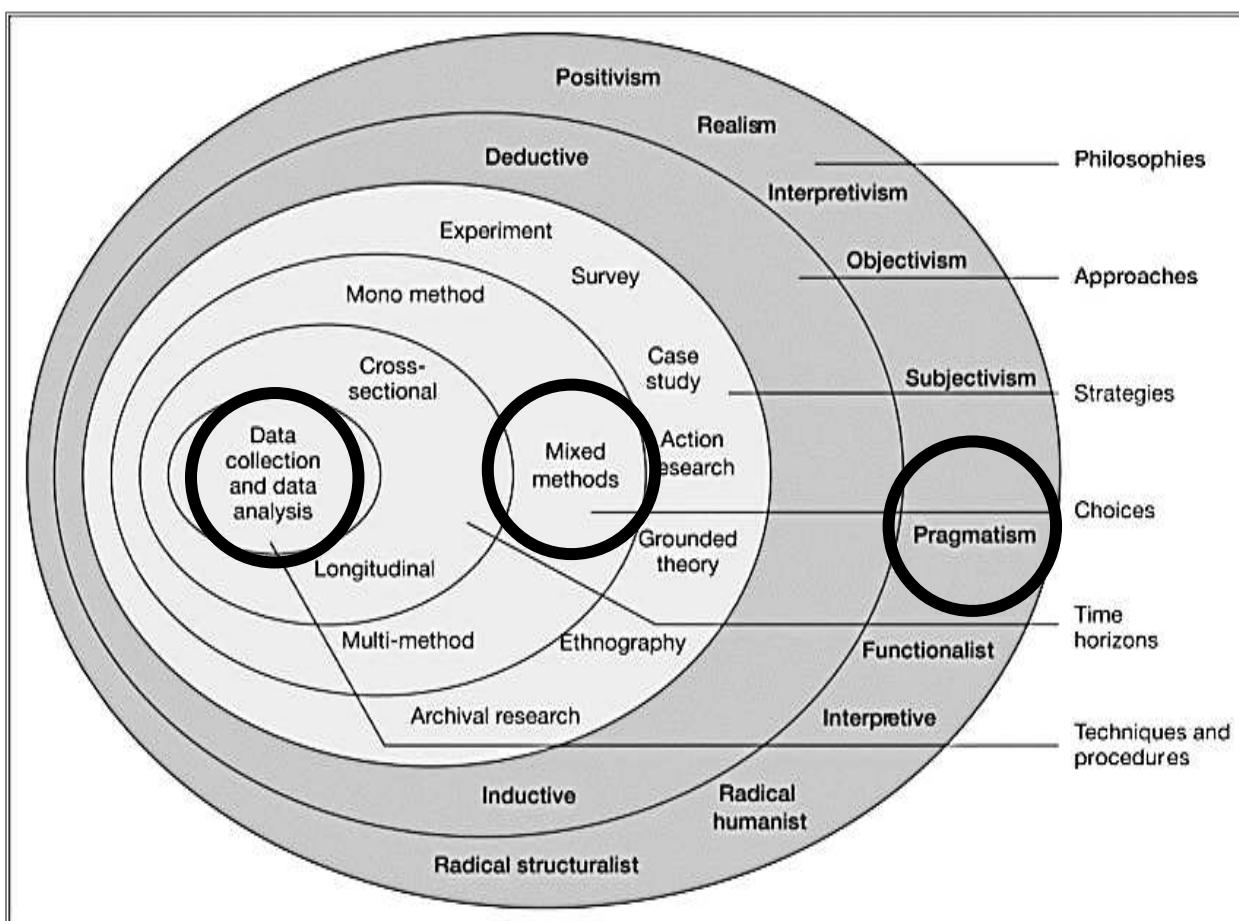
3.11 Conceptual Research Framework – Explicitly Depicted



3.0 Introduction

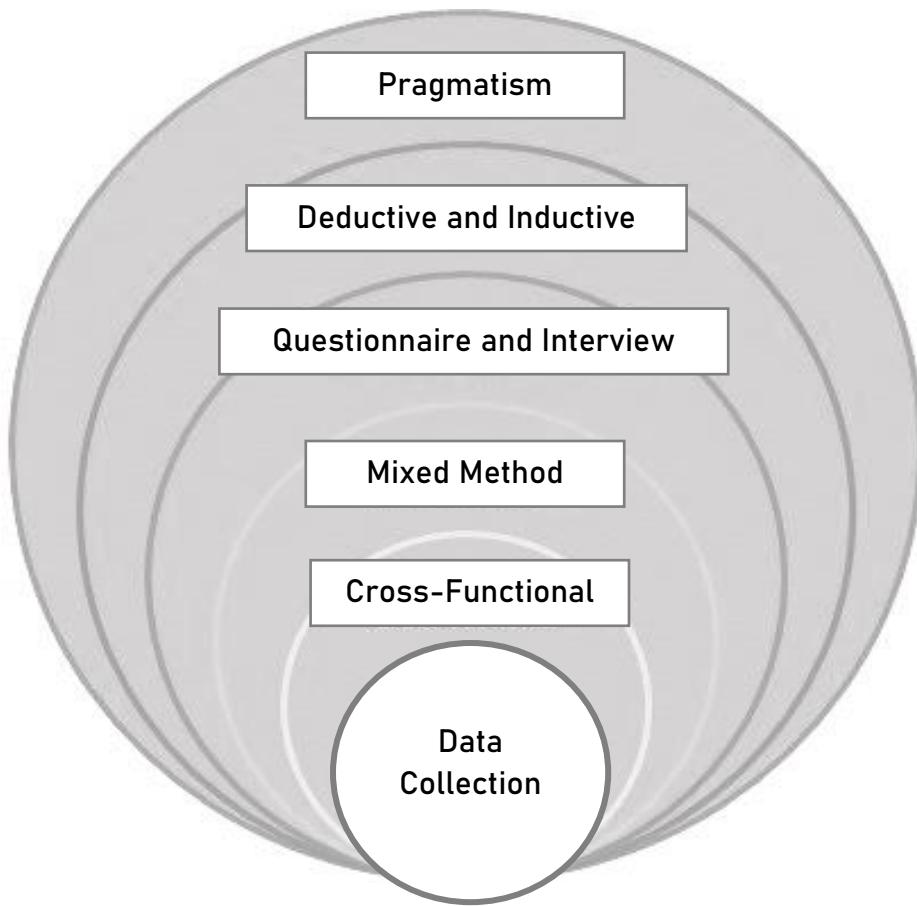
This chapter dictates the manner in which the study has been carried out pertaining the data collection and imply how the method allows the researcher to answer the research questions and thereby meet research objectives, which shall eventually solve the research problem of the study. It is imperative to understand that this section illustrates the presentation of research methodology featuring the mixed methods. Thus, the presentation may appear to be different than those formats that feature quantitative or qualitative methods only. It may also appear to be different than those formats that feature different mixed method models. The following two exhibits illustrate the complex and basic snapshot of research methodology and the existence of mixed methods as a methodology amongst the others.

Exhibit 3.0: Complex Research Onion



Source: Saunders, Lewis and Thornhill, 2016

Exhibit 3.1: Basic Research Onion – Customized According to this Research Study



Source: Saunders, Lewis and Thornhill, 2016

3.1 Mixed Method Study

Mixed method study include at least **one quantitative** and **one qualitative strand**. A strand is a component that incorporates basic process of asking question, collecting data, analyzing data and interpreting results of that data (Teddlie and Tashakkori, 2009).

3.2 Mixed Method Point of Justification

The point of justification channels the importance in justifying the use of ‘mixed methods’ approach. This is because, according to Creswell (2014), not all situations justify for the use mixed methods. This research adopts mixed method because of the following situations: -

A need exist because one data source may be insufficient. The quantitative data seems to provide a more general understanding of a problem while qualitative data provide a more detailed understanding (Creswell and Clark, 2011). Both methods provide different perspectives and have their limitations in the sense that when many individuals are quantitatively studied, the understanding of any one individual is diminished, whereas, when few individuals are qualitatively studies, the generalization of results to many individuals is lost. Since this study is interested to investigate a phenomenon (artificial intelligence as a paradoxical digital disruptor) that is new in the ecosystem, one data source is insufficient and that two data source could have their limitations offset by their strengths and the combination of the data would provide a more complete understanding of the phenomenon, than either approach itself.

A need exist to enhance the study with second method – since this study is interested to investigate a phenomenon (artificial intelligence as a paradoxical digital disruptor) that is new in the ecosystem, a second research method is added into the study to provide an enhanced understanding of the phenomenon. In particular, this research enhances the quantitative data by adding qualitative data to provide a better understanding of how artificial intelligence influences the accounting profession under the doctrine of digital disruption.

3.3 Mixed Method Philosophy

Philosophical assumptions in mixed methods research resemble a basic **set of beliefs** and assumptions that are termed as '**worldview**'. This is because, according to Guba and Lincoln (2005), mixed method researchers bring to their inquiry a worldview composed of beliefs and assumptions about knowledge that dictate their study. There are 4 worldviews in total, and pragmatism is one of the 4 worldviews that governs the set of beliefs needed for mixed method study. According to Creswell (2014), **pragmatism** is interested in **consequences of the research** and the **problem rather than the method employed** – thus always dictated in **plural grounds** as it is **real-world practice** oriented. The attributes of pragmatism is congruent towards the manner in which this research needs to be dictated, thereby addressing pragmatism as the official philosophy adopted for this research as it is interested to investigate a phenomenon (artificial intelligence as a paradoxical digital disruptor) that is new in the ecosystem.

3.4 Mixed Method Theoretical Foundation

The **theoretical foundation** in a mixed method research emphasizes on the standpoint taken by the researcher in governing the direction of the research phases (Creswell and Clark, 2011). There are two types of theory, namely, 'social sciences' theory and 'emancipatory' theory. Since this study is interested to investigate a phenomenon (artificial intelligence as a paradoxical digital disruptor) that is new in the ecosystem, the '**social sciences**' theory is adopted which channels importance in positioning the chosen theory related to the phenomena being studied, at the beginning of the mixed method study to guide the direction of the study. The social sciences theory chosen is the '**theory of disruption**' which is associated to a description of what is happening in the environment, just like an uncertainty that is inevitable, bringing opportunities and risks, at somewhat neutrally.

3.5 Mixed Method Design

This study adopts the “**Fixed Mixed Method Design**” – where the use of quantitative and qualitative methods are predetermined and planned in the beginning of the research process, and the procedures thereby are implemented as planned (Creswell, 2014).

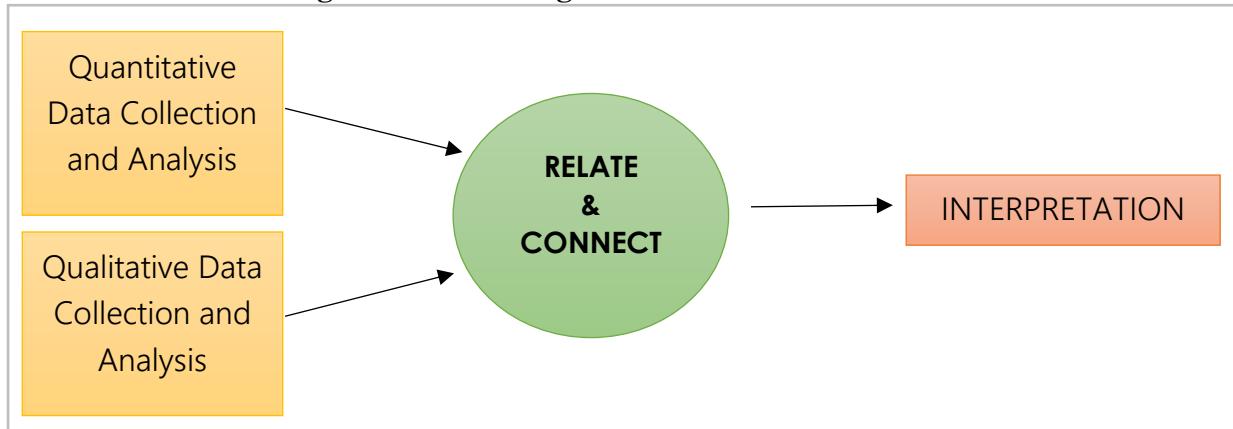
3.6 Mixed Method Approach to Design

This study adopts the “**Typology-based Approach**” for designing the mixed-method study. This approach highlights the classification of useful mixed methods designs and the selection and adoption of a particular design to the study’s objectives and questions. The typology chosen for this study is the “Convergent Parallel Design” which has notation of “QUAN + QUAL”.

3.7 The Convergent Parallel Design

The “**Convergent Parallel Design**” is a typology design that implements quantitative and qualitative strands concurrently during same stage of research process. The strands (both) are given equal priority and are kept independent during data collection, presentation and analysis. The results and findings of each strand are mixed into an overall interpretation to develop a complete understanding of the topic (Creswell, 2014).

Exhibit 3.2 The Convergent Parallel Design Framework



Source: Creswell, 2014

3.7.1 Design Purpose

The purpose of the convergent parallel design is congruent to the purpose of this research in term of the manner in which the researcher aims to address the study (Creswell and Clark, 2011). The following are the sophisticated **purposes** and the reason behind the researcher **mixing** the methods:

- To develop complete understanding of the phenomenon
- To provide a comprehensive account of the area of inquiry
- To converge, corroborate and communicate of results
- To elaborate and enhance results
- To best understand the research problem
- To obtain different but complementary data on same topic

3.7.2 Design Philosophy

The attributes of **pragmatism** is congruent towards the convergent mixed method approach and the manner in which this research needs to be dictated, thereby addressing pragmatism as the official philosophy adopted for this research as it is interested to investigate a phenomenon (artificial intelligence as a paradoxical digital disruptor) that is new in the ecosystem. The **pragmatic foundation** is feasible for this study as the research is conducting mixed methods based on the notion of '**what works**' which applies well to selecting methods that '**work**' best to address the study's problem and questions.

3.7.3 Design Level of Interaction

The **level of interaction** in a mixed method research is interested in ascertaining the degree of interaction between the quantitative and qualitative strands (Creswell and Clark, 2011). Based on the doctrine of convergent mixed methods, the quantitative and qualitative strands of this research are to remain **independent** from one another. This means to have the quantitative and qualitative data collection, presentation, analysis and articulation of findings occur **separately**. The independence of the strands only comes to an end at the point when the researcher mixes the two strands for the purpose of interpreting the data results and findings in a way that settles research hypothesis, answers research questions, meets research objectives and solves the research problem. Thus it can be said that the strands are **independent before interpretation** and **interactive during interpretation**.

3.7.4 Design Priority of the Strands

Priority in the context of mixed methods refers to the importance given to quantitative and qualitative strands within the design (Creswell, 2014). Based on the doctrine of convergent parallel mixed methods, the quantitative and qualitative methods are to have **equal emphasis** in answering research questions, meeting research objectives and solving the research problem.

3.7.5 Design Timing of the Strands

Timing in the context of mixed methods refers to the pacing and implementation pertaining the temporal relationship between quantitative and qualitative strands (Creswell and Clark, 2011). This means the order in which the results from the two data sets is used. Based on the doctrine of convergent parallel mixed methods, the timing of the quantitative and qualitative strands occurs at **concurrent timing**. This means the quantitative and qualitative strands are implemented during single phase in the study and not at multiple phases with one phase attended after the other phase.

3.7.6 Design Point of Interface

Mixing in the context of mixed methods refer to the **interrelating** of quantitative and qualitative strands for the purpose of **interpreting** the data results and findings in a way that settles research hypothesis, answers research questions, meets research objectives and solves the research problem.

Based on the doctrine of convergent mixed methods, the mixing of the results is the epitome of this design and is articulated by '**point of interface**' that is the stage of integration where quantitative and qualitative data are mixed. The mixing happens '**during interpretation**' after both quantitative and qualitative data is collected, presented, analyzed, and findings articulated separately – where an interactive '**merging strategy**' is used to bring the two sets of results into a combined analysis. The merging strategy adopted in this research follows '**relating' the quantitative and qualitative results and findings side by side to see if they converge'**.

Based on the outcome, the results and findings are **mixed into interpretation** with quantitative appearing first in the explanation followed by qualitative as a supportive finding that works on an interpretation focusing on settling research hypothesis, answering research questions, meeting research objectives and solving the research problem.

It can be evaluated that, since the mixing happens **during interpretation**, it is equivalent to addressing the ‘mixing’ occurring at the **final step** of the research process, where the researcher is **drawing conclusions during the overall interpretation** where the study is ending. This is the only point of interface for mixed method designs that keep the strands independent till interpretation. Eventually, this dictates what was **learned** from the **combination** of results from two strands – thereby providing a **complete understanding** of the phenomenon (Creswell, 2014).

3.7.7 Design Mixing Strategy

Based on the doctrine of convergent mixed methods, the quantitative and qualitative strands of this research are to remain **independent** from one another. This means to have the quantitative and qualitative data collection, presentation, analysis and articulation of findings occur **separately**.

The independence of the strands only comes to an end at the point when the researcher mixes the two strands for the purpose of interpreting the data results and findings in a way that settles research hypothesis, answers research questions, meets research objectives and solves the research problem. The mixing happens ‘**during interpretation**’ after both quantitative and qualitative data is collected, presented, analyzed, and findings articulated separately – where an interactive ‘**merging strategy**’ is used to bring the two sets of results into a combined analysis. The merging strategy adopted in this research follows ‘**relating the quantitative and qualitative results and findings side by side to see if they converge**’.

Based on the outcome, the results and findings are **mixed into interpretation** with quantitative appearing first in the explanation followed by qualitative as a supportive finding appearing subsequently that works on an interpretation focusing on settling research hypothesis, answering research questions, meeting research objectives and solving the research problem. It can be evaluated that, since the mixing happens **during interpretation**, it is equivalent to addressing the ‘mixing’ occurring at the **final step** of the research process, where the researcher is **drawing conclusions during the overall interpretation** where the study is ending.

3.7.8 Design Common Variant

There is only **one variation** that is found in this research study, in terms of the manner in which the convergent mixed method is adopted and implemented. The variation is related to the '**parallel database variant**' – where the independent parallel strands are brought together via 'mixing' that is interested in '**relating**' the **quantitative and qualitative results and findings side by side to see if they converge**', and **not particularly to compare or transform the data**. This is because, since this study adopts the "**fixed mixed method design**" – where the use of quantitative and qualitative methods are predetermined and planned in the beginning of the research process, and the procedures thereby are implemented as planned, the results and findings of the quantitative and qualitative are at **high probability** to **relate** and be **connected**. This is because the research plans to ensure the data can provide a **complete understanding** of the phenomenon being studied.

3.7.9 Design Use

The following represent the considerations when to use convergent parallel mixed methods design. These **considerations** are **congruent** to the situation of the researcher, which motivated the researcher to make use of the design.

- 1) Limited time for collecting data and must collect both types of data
- 2) There is equal value for collecting and analyzing both quantitative and qualitative data to provide a complete understanding of the phenomenon studied by the research
- 3) To have skills in both quantitative and qualitative methods of the research
- 4) To manage extensive data collection and analysis activities

3.8 Mixed Methods Data Collection Method

According to Creswell and Clark (2011), in the convergent parallel design, data collection is performed by collecting both quantitative and qualitative data, concurrently, analyzing the data separately and merging the two database during interpretation. Despite the design prioritizes both methods, there are several variants when addressing quantitative and qualitative data collection. Creswell and Clark (2011) encourage to advance quantitative strand that includes **rigorous quantitative data** collection procedure and qualitative strand that includes **persuasive qualitative data** collection procedure.

There are 5 key components that govern the data collection in mixed methods. These components shall be addressed for quantitative and qualitative data collection separately.

3.8.1 Rigorous Quantitative Data Collection

Using sampling procedure. The site studied is Malaysia. The participants studied are white collar professional accountants. According to news article produced by Bernama in 2018, Malaysia has approximately a population of 32 million people, in which 33 thousand are professional accountants, of them 20 thousand are chartered accountants. In general, Malaysia is reported to be lack of Accountants and Government of Malaysia aims to reach total of 60 thousand Accountants by 2020. Based on this statistics, it is impractical to collect primary data from 33 thousand accountants. Thus, the Raosoft Sampling Calculator is adopted to determine ideal sample size of accountants for collecting quantitative data. Based on the following extract of Raosoft Sample Size Calculation, the margin of error accepted is 10%, followed by 90% of confidence level and population chosen is 33 thousands accountants according to Malaysian Statistics on Accountants Population 2019. The response selection has been retained to be 50%. The ideal sample size recommended is 68, however a total of 120 responses were received. The use of Raosoft Sample Size Calculator is evident that the sampling strategy adopted is probabilistic sampling.

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Exhibit 3.3: Raosoft Sample Size Calculator



Sample size calculator

What margin of error can you accept? %
5% is a common choice
The margin of error is the amount of error that you can tolerate. If 90% of respondents answer yes, while 10% answer no, you may be able to tolerate a larger amount of error than if the respondents are split 50-50 or 45-55.
Lower margin of error requires a larger sample size.

What confidence level do you need? %
Typical choices are 90%, 95%, or 99%
The confidence level is the amount of uncertainty you can tolerate. Suppose that you have 20 yes-no questions in your survey. With a confidence level of 95%, you would expect that for one of the questions (1 in 20), the percentage of people who answer yes would be more than the margin of error away from the true answer. The true answer is the percentage you would get if you exhaustively interviewed everyone.
Higher confidence level requires a larger sample size.

What is the population size?
If you don't know, use 20000
How many people are there to choose your random sample from? The sample size doesn't change much for populations larger than 20,000.

What is the response distribution? %
Leave this as 50%
For each question, what do you expect the results will be? If the sample is skewed highly one way or the other, the population probably is, too. If you don't know, use 50%, which gives the largest sample size. See below under **More information** if this is confusing.

Your recommended sample size is **68**
This is the minimum recommended size of your survey. If you create a sample of this many people and get responses from everyone, you're more likely to get a correct answer than you would from a large sample where only a small percentage of the sample responds to your survey.



What margin of error can you accept?

%
5% is a common choice

What confidence level do you need?

%
Typical choices are 90%, 95%, or 99%

What is the population size?

If you don't know, use 20000

What is the response distribution?

%
Leave this as 50%

Your recommended sample size is **68**

Source: Raosoft, 2019

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Collecting information. The quantitative data is collected using questionnaire instrumentation which is prepared using the Google Forms software features. The questionnaire created is electronic version governed by a sophisticated link which is forwarded to accountants whom can complete it on any electronic devices, conveniently at their own pace and time. The questionnaire follows the Likert Scale format with scale ranging from number 1 to 5 in which 1 being strongly disagree and 5 being strongly agree. The questions in the questionnaire represent “close-ended questions” based on this predetermined response scale.

Administering procedures. The data collected in quantitative research are administered with little variation as possible to avoid biasness to be introduced in the process.

3.8.2 Persuasive Qualitative Data Collection

Using sampling procedure. The site studied is Malaysia. The participants studied are white collar professional accountants who are selected based on purposeful sampling methodology according to certain age, industry working experience and academic qualification (the details are reveled in chapter 4). This is because, it is the only way to ensure participants selected are those who have good knowledge pertaining the phenomenon and the key concepts explored by the study. The purposeful qualitative sample includes selected individuals from the quantitative sample size where a total of 9 participants are selected from the quantitative sample size of 68 people. This is because, it is encouraged in convergent mixed method to have individuals who participate in qualitative study to be individuals from quantitate study. Although, it is encouraged to have the exact same number of people for both quantitative and qualitative samples, it is not mandatory and that the small sample size of 9 interviewees is ideal to obtain in-depth information about the phenomenon explored by the research. Since the total quantitative response received were 120, it can be said 9 out of the 120 quantitative respondents were included in the qualitative sample.

Gaining permission. Research approval was received from Asia Pacific University for the authorization to carry out interview. The interviewees were presented with these authorized forms to portray the legitimacy in carrying out the interview. Concurrently, permission was asked and obtain from each interviewee before carrying out the interview. This is to ensure that it took place at their willingness. A consent form was prepared which required the initials of the interviewee pertaining how the data collected shall be protected and not disclosed to any third party without their consent.

Collecting information. The qualitative data is collected using one-on-one semi-structured interview methodology which featured a question and answer discussion based on open-ended questions.

Recording the data. The response of each interviewee was recorded in writing and audio recordings upon obtaining consent. This followed the interview protocol that included questions to be asked during the interview and the space for recording information gathered during interview.

Administering procedures. The data collected in qualitative research is reviewed and anticipated pertaining the types of issues that were likely to arise in ‘the field’ that yielded less-than adequate data.

3.8.3 Convergent Mixed Method Data Collection Questions

Based on the quantitative strand that includes **rigorous quantitative data** collection procedure and qualitative strand that includes **persuasive qualitative data** collection procedure, there are **several questions** asked during these procedures when it comes to collecting data using **convergent parallel mixed method design**. The following are the questions and the respective answers based on what is adopted in this research.

Data Collection Elements of Interest	Data Collection Design for Mixed Method
Will two samples include same of different individuals?	The two samples include same individuals (Accountants) but the qualitative sample include selected individuals from the quantitative sample size.
Will sample size be of same size?	The samples are not be of same size. The qualitative sample size is smaller than quantitative to obtain in-depth qualitative exploration and rigorous quantitative examination.
Will the same concept of the research be accessed quantitatively and qualitatively?	The same concept was accessed with questions being parallel, but not congruent, and differing in quantity. The quantitative and qualitative questions were shaped according to the doctrine of their approaches, respectively.
Will the data be collected from two independent sources or from single source?	The data is collected based on independent quantitative data through questionnaire and independent qualitative data through one-on-one semi-structured group interviews – thereby from two sources.

Source: Creswell, 2014

Based on the doctrine of convergent mixed methods, a good option is stated to be for the two sample sizes to be of different sizes, with the size of qualitative sample size being much smaller than the quantitative sample size. This is exactly what has been adopted in this research where the qualitative sample size is 9 respondents and the quantitative sample size features 120 received respondent's responses. However, this is a big disparity, in terms of the balance between the 9 and 120 respondents which does not appear to correlate logically. This raises questions pertaining how the research may be able to relate the data and perform a merge between two databases in any meaningful way when the size is so different. **It is important to understand, that the logic behind the feasibility of 120 quantitative and 9 qualitative respondents for data converging and data merging is that the size differential is not at all a problem because the intent of the data gathering is different for the two databases – where the quantitative data collection aims towards making generalizations to a populations while qualitative data seeks to develop and in-depth understanding from a niche group of people.**

3.9 Mixed Methods Data Analysis

Based on the convergent parallel mixed method, the data collection, presentation, analysis and articulations of findings is to be performed separately for the quantitative and qualitative methods. The following is the method adopted in analyzing and articulating the findings of the quantitative and qualitative data, separately.

3.9.1 Quantitative Data Analysis

The quantitative strand is presented and analyzed based on the data collected from questionnaire survey which featured responses from 120 respondents who are accountants. The probability sampling using Roasoft required only 68 responses, but a total of 120 were received and taken for analysis to provide better findings. The questionnaire carried a total of 42 questions which were split into 3 important sections, namely, ‘the demographic profile’, ‘relationship paradigm’ and ‘level of influence paradigm’. The data collected from the questionnaire responses is presented and analyzed by carrying out multiple tests specific to quantitative approach using SPSS software. The quantitative data collected is analyzed through 6 important tests using SPSS (Statistical Package of Social Sciences) software.

First, descriptive analysis results obtained after analyzing the questionnaire data using SPSS software. The data is presented in a table format featuring each question and its respective frequencies, percentages and mean. The “mean” (or average) is the most significant value from the descriptive statistics as it is going to be the leading value used to analyze and interpret the data presented. This is because “mean” is the only value that incorporates all the results of all the data points (per question) and then derives the central tendency of the data in a question – which shows the status of the results per question on an average. This is an ideal and accurate approach as it does not favor extreme high or low values, rather encompasses all values and preaches an average.

Second, descriptive statistics produced by SPSS is the summary of the data collected in terms of its central tendency, variability and normality deviation pertaining all the variable distribution. An emphasis is given to skewness and kurtosis. Skewness is a descriptive statistic that measures distribution asymmetry whereas kurtosis measures the degree to which value distributes around the middle point. The normality values are typically accepted between -2 and +2, which are also accepted as favorable for the skewness and kurtosis measurements.

Third, Reliability Test is conducted to evaluate the dependability of data distributed and to ascertain if the results obtained are continuously consistent. This is possible when the Reliability Test measures the consistency of each variable (Creswell, 2014). To do this, the test is typically performed using the Cronbach Alpha index that will accurately determine the reliability and validity of the questions inserted in the questionnaire.

However, it is imperative to follow the doctrine of Cronbach Alpha that specifically states that the outcome of the test must be in numeric values between 0 to 1 only and that the data supplied is significantly considered to be reliable when it is >0.70 or <0.90 . Any results below 0.70 would mean there is low number of questions and that there is poor relation between them, whereas, any results above 0.90 would mean there is high number of questions, which eventually cause redundancy. This is because, according to Creswell (2014), Cronbach Alpha is deduced majorly based on length of test and questionnaire data dimensionality.

Fourth, Pearson Correlation Coefficient Test. The doctrine of Correlation is determined in finding the relationship between two variables, such as independent and dependent variable. This doctrine is brought into practice by conducting the **Pearson Correlation Coefficient Test** using the Bivariate Index that measures the strength and direction of linear relationship between two variables.

The results obtained from this test must be interpreted according to certain essential requirements – that is the results derived should be between -1 and +1 ($-1 < r > +1$), and that values nearer to +1 demonstrate a high positive relationship between the two variables, whereas, values nearer to -1 indicate that there is high negative relationship between the two variables. Consequently, values nearer to 0 indicate no relationship between two variables.

The positive relationship indicate the momentum of the two variables to move and change in same direction (one increases with the increase of the other, vice versa) whereas negative relationship define the momentum of the two variables to move and change at opposite directions (one increases, the other decreases; vice versa).

Besides the Pearson Correlation r value, the Pearson Correlation Coefficient Test using the Bivariate Index also discloses the significance of the relationship through the value of Sig (2-tailed). The association of the value with significance is that if the Sig (2-tailed) value is higher than 0.05, then there is no significance in the relationship between two variables. Conversely, if the value obtained is lower than 0.05, then the relationship is significant.

Fifth, Multiple Linear Regression Test. Multiple regression is based on correlation but appears to be a more sophisticated extension of correlation that discovers the interrelationships amongst variables (more than one variable). It is used to ascertain the predictive ability of a set of IVs on one continuous dependent measure. This means it is interested in exploring the relationship between a number of IVs (predictors) and the DV. The outcome of test communicates how well the IVs are able to predict the DV. There are several multiple regression analyses, however this study adopts the “Multiple Linear Regression” analysis that models the linear relationship between the independent (explanatory) variable and dependent (response) variable, both being continuous (Pallant, 2013).

Artificial Intelligence as a Paradoxical Digital Disruptor in the Accounting Profession.

The multiple regression equation is as follows.

$$Y = \beta + \beta_1(X_1) + \beta_2(X_2) + \beta_3(X_3) + \epsilon^t$$

This equation clearly shows the correlation of DV's and IV's in terms of how the DV's is subject to changes due to the influencing power of IVs.

In this case, Y is the DV and the X is the IV. Beta is the main IV. ϵ^t is error term.

In this study, there will be 2 regression models, **Simple** and **Complex**.

- **Simple Regression Model:** covers two major IVs of the main IV
- **Complex regression Model:** cover all sub IVs of the 2 major IV

$$Y = \beta + \beta_1(X_1) + \beta_2(X_2) + \beta_3(X_3) + \epsilon^t$$

SIMPLE REGRESSION MODEL

Y= Accounting Profession

β = Artificial Intelligence

$\beta_1 (Xn)$ = AI (opportunity creating factors)

$\beta_2 (Xn)$ = AI (threat igniting factors)

$$Y = \beta + \beta_1(X_1) + \beta_2(X_2) + \beta_3(X_3) + \epsilon^t$$

COMPLEX REGRESSION MODEL

Y= The Evolving Role of Accountants in the Accounting Profession

β = Artificial Intelligence as a Paradoxical Digital Disruptor

$\beta_1(X_1)$ = AI (Decision Support)

$\beta_1(X_2)$ = AI (Machine Learning and Teaching)

$\beta_1(X_3)$ = AI (Intellectual Capacity and Expertise Storing)

$\beta_1(X_4)$ = AI (Digital Management)

$\beta_1(X_5)$ = AI (Data Proliferation)

$\beta_1(X_6)$ = AI (Consistency and Reduction of Errors)

$\beta_2(X_7)$ = AI (Exceptional Proficiency)

$\beta_2(X_8)$ = AI (Data Specification)

$\beta_2(X_9)$ = AI (Implementation Cost)

$\beta_2(X_{10})$ = AI (Programming Malfunction)

$\beta_2(X_{11})$ = AI (Complicated Algorithm)

$\beta_2(X_{12})$ = AI (Misconception)

Sixth, Multiple Linear Regression using Fisher's ANOVA test. The Analysis of Variance (ANOVA) determine the influence that IVs have on the DV under the regression analysis. This is done by splitting the total variability of DV into systematic and random factors in which the systematic factors have influence on DV and random factors omit to have any influence (Pallant, 2013).

3.9.2 Qualitative Data Analysis

The qualitative strand is presented and analyzed based on the transcript information collected during the one-on-one semi-structured interview sessions that featured 9 Chartered Accountants. Since this research follows a fixed mixed method design which implies the quantitative and qualitative methods to be preplanned, the researcher selected 9 people from the 68-120 respondents who were to take part in the questionnaire survey. However, the 9 people were selected based on convenient sampling as only those who met certain demographic requirements in terms of age, years of working experience and academic qualification, were selected. This is because the researcher was ardent to maintain quality in the data collected from the interviewees.

A total of 8 questions were asked during the interview. The first 3 were directed towards investigating the “relationship paradigm” that aims to ascertain the positive and negative relationship between AI and AP, and the remaining 5 were directed towards investigating the “level of influence paradigm” that aims to ascertain the significant level of influence of AI on AP (whether is it more towards positive or negative), through discussing the doctrine of “tech-embracing ability” of Accountants, which eventually will reveal whether AI complements or replaces role of Accountants, and the continuity status of the AP.

The data collected from the interview responses is presented and analyzed by carrying out contextual coding analysis which is a qualitative data analysis method prescribed by mixed method and encouraged to be used for convergent mixed method studies.

The contextual coding analysis performed through extracting the most important pointers, grouping them and labelling them with preliminary codes and then regrouping them into broader codes known as themes, so that they reflect increasingly broader perspectives. In short, it is the process of filtering the complex data collected from the original interview responses, so as to merge with quantitative data results, to perform further data analysis and interpretation.

3.10 Mixed Methods Ethics and Codes

The following are several ethical considerations that was uplifted: -

- 1) All information shall be kept in highest degree of privacy and confidentiality
- 2) Consent from respondents shall be obtained prior to survey
- 3) Respondents shall not be forced to take part in this questionnaire and interview
- 4) Misinterpretation and distortion of data shall be prevented
- 5) Respondents should pledge to give maximum corporation once agree to participate
- 6) Truthful and honest response is demanded from respondents

3.11 Conceptual Research Framework

CONCEPTUAL RESEARCH FRAMEWORK

-What You Need To Know-

The authentic research framework is illustrated in a distinct diagram using graphical design customized to dictate the essence of the study.

The framework (from the left) positions **Artificial Intelligence as a Paradoxical Digital Disruptor** as the **MAIN Independent Variable (IV)** which then branches out to **2 HEAD IVs** namely, “**Opportunity Creator**” and “**Threat Igniter**” – which are both resembling its paradoxical personalities. These **2 HEAD IVs** further expand themselves deeper into generating **6 SUB IVs** each, ranging **12 SUB IVs** in total.

The **Opportunity Creator SUB IVs** are *Decision Support, Machine Learning and Teaching, Intellectual Capacity and Expertise Storing, Digital Management, Data Proliferation, Consistency and Error Reduction.*

The **Threat Igniter SUB IVs** are *Exceptional Proficiency, Data Specification, Implementation Costs, Programming Malfunction, Complicated Algorithm and Misconception.*

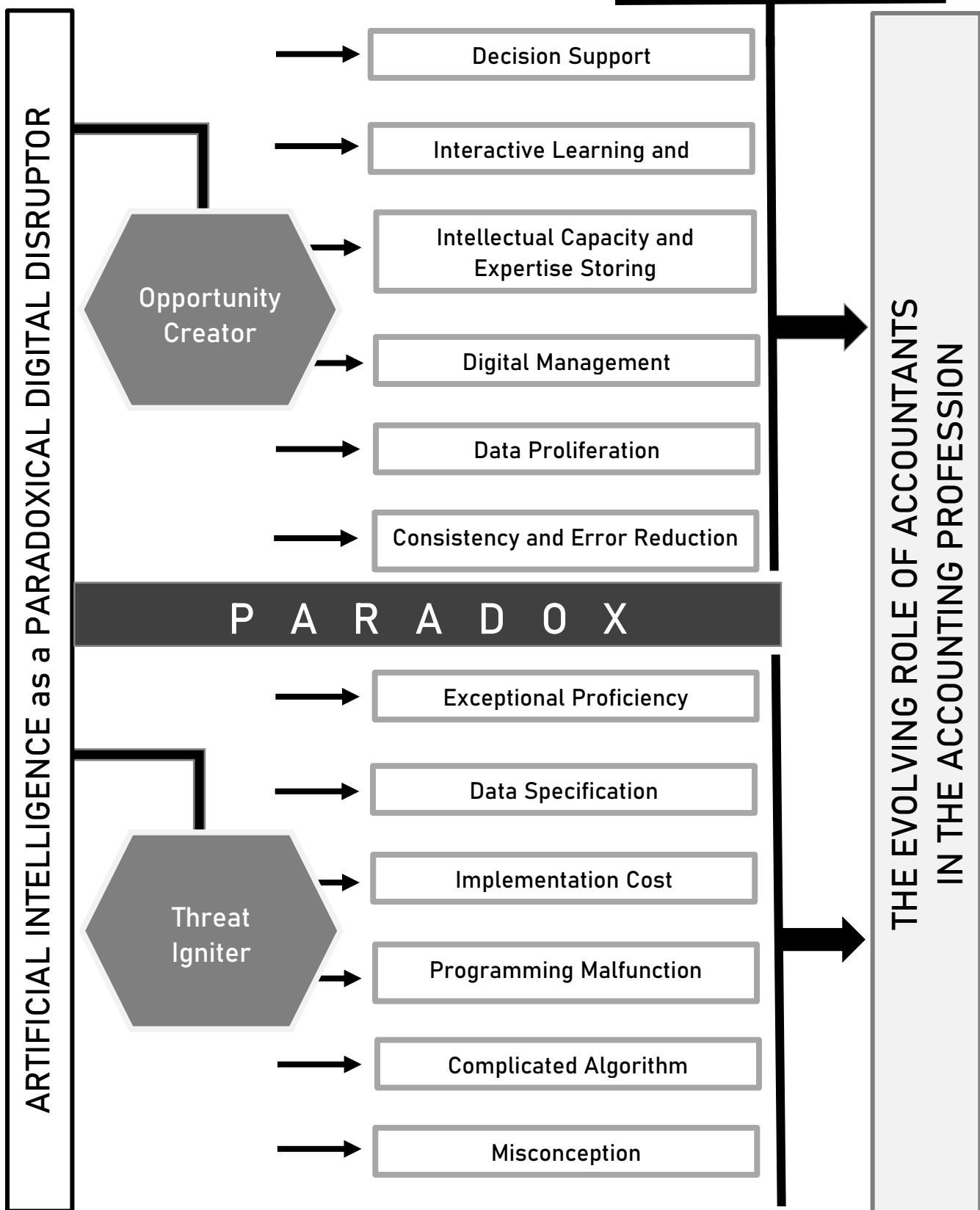
All these IVs are position (from the left) in a manner that allows the research to explore its influencing power towards the **MAIN Dependent Variable (DV)**, that is, **The Evolving Role of Accountants in the Accounting Profession.**

**It is highly encouraged to closely read the research framework presented in the following pages in order to develop a clear understanding of the phenomenon being studied.*

CONCEPTUAL RESEARCH FRAMEWORK

IV

DV



Source: Creation by author of this research study

3.11.1 Paradigms in Research Area

ONE AREA OF STUDY, 2 PARADIGMS

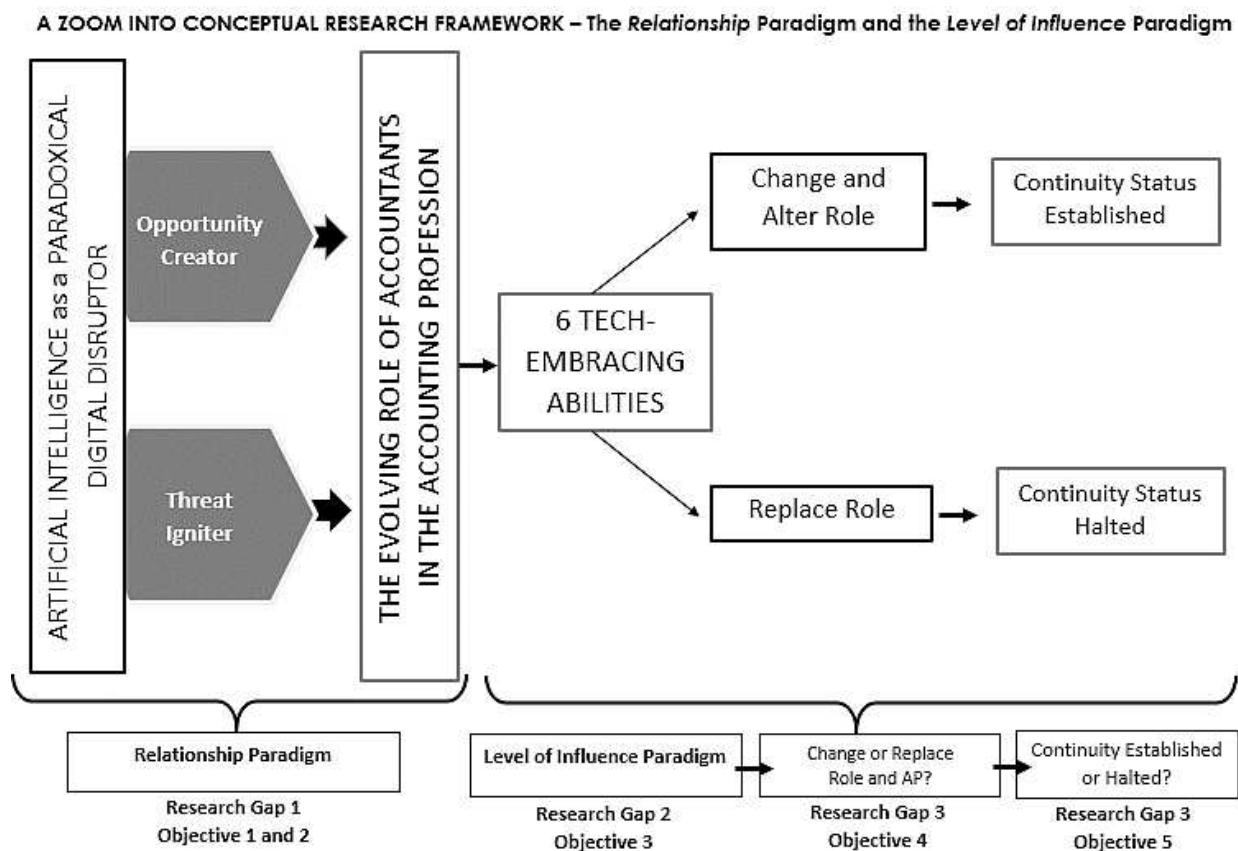
It is imperative to understand that the research carries out a study on one area only, but there are two paradigms in that area, which is the '**Relationship Paradigm**' and '**Level of Influence Paradigm**'. The second paradigm is an extension of the first paradigm and both paradigm have to be studied and experimented one after another in order to provide a complete understanding of the phenomenon preached by the topic of this research study. The paradigms are related and cannot exist without each other.

Based on the conceptual research framework illustrated above, it can be observed that it illustrates the '**Relationship Paradigm**' only. This is because it is the heart of this research and the researcher intends to keep the framework simple and understandable, without making it complex. This is why the '**Level of Influence**' paradigm is not incorporated into the conceptual framework. This shows how the '**Level of Influence**' paradigm is treated as an extension of the '**Relationship Paradigm**'.

Regardless, the second paradigm is an extension of the first paradigm and both paradigm have to be studied and experimented one after another in order to provide a complete understanding of the phenomenon preached by the topic of this research study. This raises the need to illustrate how the extension appears to look.

The following pages illustrate the both paradigm and explain the role of the paradigms in this research area based on the objectives.

Artificial Intelligence as a Paradoxical Digital Disruptor in the Accounting Profession.



THE RELATIONSHIP PARADIGM – Explained

The relationship paradigm is the first paradigm identified in the area of this research study. This is because it resembles the epitome of this research study. This paradigm is best dictated based on the first 2 objectives of the study.

The first objective of the relationship paradigm relates to addressing the first side of AI's paradoxical digital disrupting nature that is specifically its 'Opportunity Creating' dimension. The objective is built to investigate whether AI creates opportunities through the 6 opportunity creating factors that possess the ability to transforms AP by evolving the role of Accountants. Based on the results, the objective is interested to identify the type of relationship established between AI and AP and whether the relationship is significant.

The second objective of the relationship paradigm relates to addressing the second side of AI's paradoxical digital disrupting nature that is specifically its 'Threat Igniting' dimension. The objective is built to investigate whether AI ignites threats through the 6 threat igniting factors that possess the ability to halt the role of Accountants from evolving. Based on the results, the objective is interested to identify the type of relationship established between AI and AP and whether the relationship is significant.

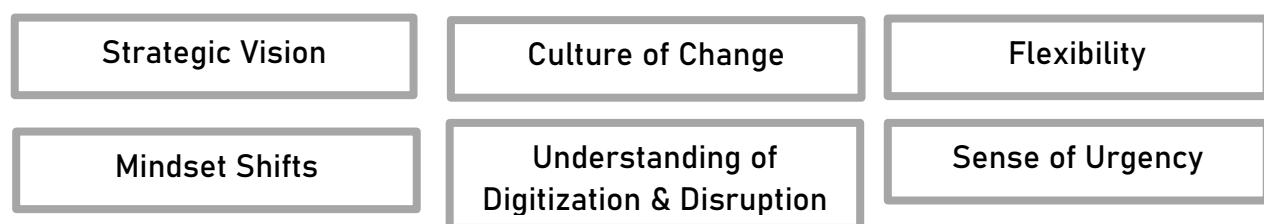
THE LEVEL OF INFLUENCE PARADIGM – Explained

The level of influence paradigm is the second paradigm identified in the area of this research study. This is because it resembles an extension of the first paradigm. This paradigm is best dictated based on third objective of this study.

The first and second objectives relate to addressing the paradoxical digital disrupting nature of AI that is specifically its ‘Opportunity Creating’ and “Threat Igniting” dimensions. It is this point of the research where the researcher bring in **the third objective** which intends to investigate the level of influence of AI on AP in terms of whether AI is to more positively or more negatively impact AP. Thus the researcher adopts the most accurate medium to measure and reveal the significant level of influence – that is the “Tech-Embracing Ability of Accountants”. There are 6 tech-embracing abilities (TEA) identified by the researcher that appear to be the top capabilities needed for accountants in embracing AI. This means the true impact of AI on AP lies in the hands of the accountants.

The doctrine of Tech-Embracing Ability preaches that the level of positive and negative influence of AI on AP is likely to be decided based on the tech-capabilities of Accountants. This means the accountants have to have these 6 (at least) capabilities in order to ensure they are on-track and have strong readiness towards embracing digitalization and AI, and if they have, it means they are to embrace AI and are likely to enjoy a positive impact, thereby having AI to have a higher degree of positive and favorable, opportunity-creating influence on AP, rather than adverse, threat-igniting influence.

There are 6 TEA in adopted in this research. They are: -



Artificial Intelligence as a Paradoxical Digital Disruptor in the Accounting Profession.

It is at this point in the research where the ‘Level of Influence’ paradigm is required to reveal 2 important answers to two areas of investigation, namely, ‘whether AI will change and alter or replace the accountants and the AP’ and ‘whether the continuity status of AP is established or halted’. This is best explained by the fourth and fifth objectives.

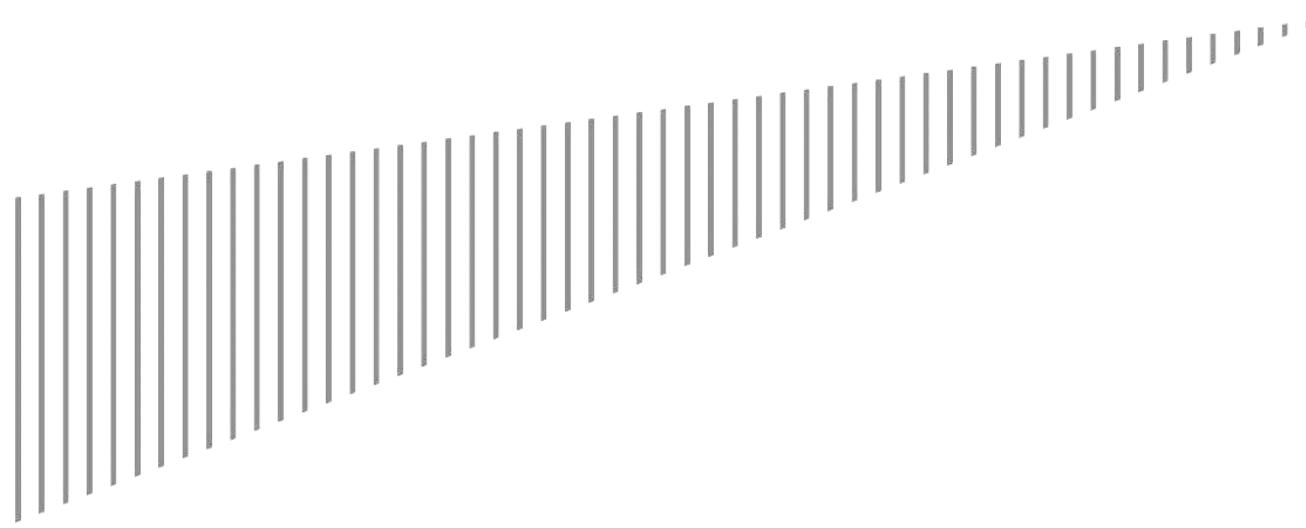
The fourth objective is made to be met based on the results of the third objective. This objective is an extension of the third objective. It is designed to be interested to identify the impact on the role of accountant based on objective 3 that ascertained the level of influence of AI on AP.

If results of objective 3 are based on AP enjoying a high level of significant positive opportunity creating influence from AI, then in objective 4, AI is to change rather than replacing the role of accountants. If results of objective 3 are based on AP suffering a high level of significant negative threat igniting influence from AI, then in objective 4, AI is to replace rather than change the role of accountants.

The fifth objective is made to be met based on the results of the fourth objective. This objective is an extension of the fourth objective. It is designed to be interested to identify the impact on the continuity of AP based on objective 4 that ascertained the whether AI is changing or replacing the role of accountants in the AP. If results of objective 4 are based on AP to have its roles experience change and alteration by AI, then in objective 5, the continuity of AP is established to sustain. However, if results of objective 4 are based on AP to have its roles replaced by AI, then in objective 5, the continuity of AP shall be halted.

Mixed Method Study	
Content Area and Field of Study	Artificial Intelligence as a Paradoxical Digital Disruptor in the Accounting Profession
Philosophical Foundations	Pragmatism Worldview
Theoretical Foundations	Social Sciences: Theory of Disruption
Content Purpose	To provide a complete understanding of the phenomenon
Quantitative Strand	
Sample	N=120 Probability Sampling using Raosoft calculator Individuals who are white collar accountants from 4 employment sectors of the industry namely, public sector, public practice, commerce and industry and academia
Data Collection	Questionnaire
Data Analysis	Descriptive using ‘mean’ (central tendency) index Descriptive following ‘kurtosis’ and ‘skewness’ Reliability Test using Cronbach’s Alpha Index Pearson Correlation using Bivariate Index Multiple Regression using Linear Index Multiple Regression using Fisher’s ANOVA Index
Qualitative Strand	
Sample	N=9 Purposeful Sampling according to certain age, industry working experience and academic qualification Individuals who are white collar accountants from 4 employment sectors of the industry namely, public sector, public practice, commerce and industry and academia
Data Collection	Transcripts generated from one-on-one semi-structured Interview Session

Mixed Method Features	
Design Purpose	<ul style="list-style-type: none"> • To obtain different but complementary data on same topic • To best understand the research problem • To converge, corroborate and communicate of results • To elaborate and enhance results • To provide a comprehensive account of the area of inquiry • To develop complete understanding of the phenomenon
Typical Paradigm Foundation	<ul style="list-style-type: none"> • Pragmatism shall be adopted as an umbrella philosophy
Level of Interaction	<ul style="list-style-type: none"> • Independent
Priority of the Strands	<ul style="list-style-type: none"> • Equal emphasis in addressing research problem, objectives and questions
Timing of the Strands (Temporal relationship between two strands)	<ul style="list-style-type: none"> • Concurrent – simultaneously
Primary Point of Interface for Mixing	<ul style="list-style-type: none"> • Mixing during interpretation
Primary Mixing Strategies	<p>Merging of the two strands shall occur: -</p> <ul style="list-style-type: none"> • After separate data collection, presentation, analysis and findings articulation • During interpretation, final stage of research
Common Variants	<ul style="list-style-type: none"> • Parallel databases – strands are independent and brought together during interpretation
Mixed Method Design	
Mixed Method Design Type	<ul style="list-style-type: none"> • Convergent Parallel Mixed Method
Notation	<ul style="list-style-type: none"> • QUAN+QUAL=Complete Understanding



CHAPTER 4

DATA PRESENTATION &

ANALYSIS

DOCUMENT FLOW

For this Section Only

4.0 Introduction

4.1 Quantitative Data Presentation and Analysis

4.1.1 Demographic Profile

4.1.2 *Relationship Paradigm*

4.1.2.1 Descriptive Analysis and Statistics

4.1.2.2 Reliability Test

4.1.3 *Level of Influence Paradigm*

4.1.3.1 Descriptive Analysis and Statistics

4.1.3.2 Reliability Test

4.2 Qualitative Data Presentation and Analysis

4.2.1 Demographic Profile

4.2.2 *Relationship Paradigm*

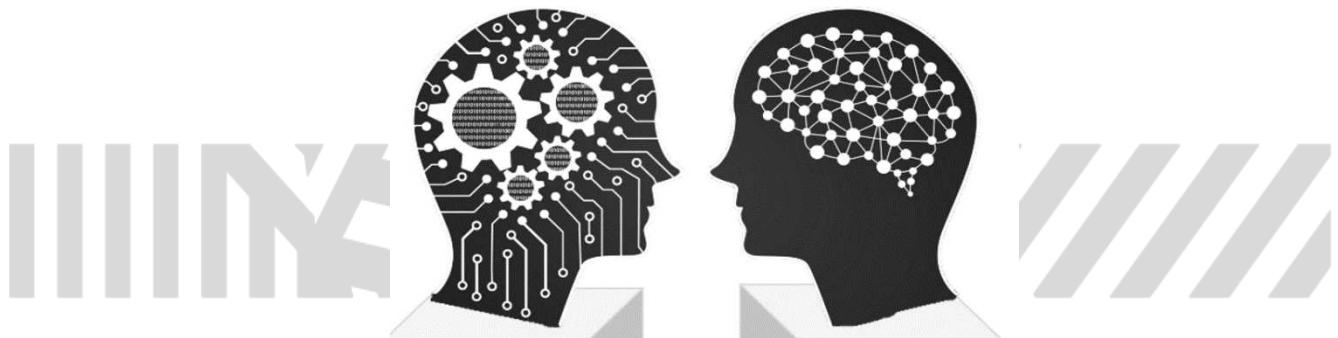
4.2.2.1 Qualitative Data Presentation

4.2.2.2 Contextual Coding Analysis

4.2.3 *Level of Influence Paradigm*

4.2.3.1 Qualitative Data Presentation

4.2.3.2 Contextual Coding Analysis



4.0 Introduction

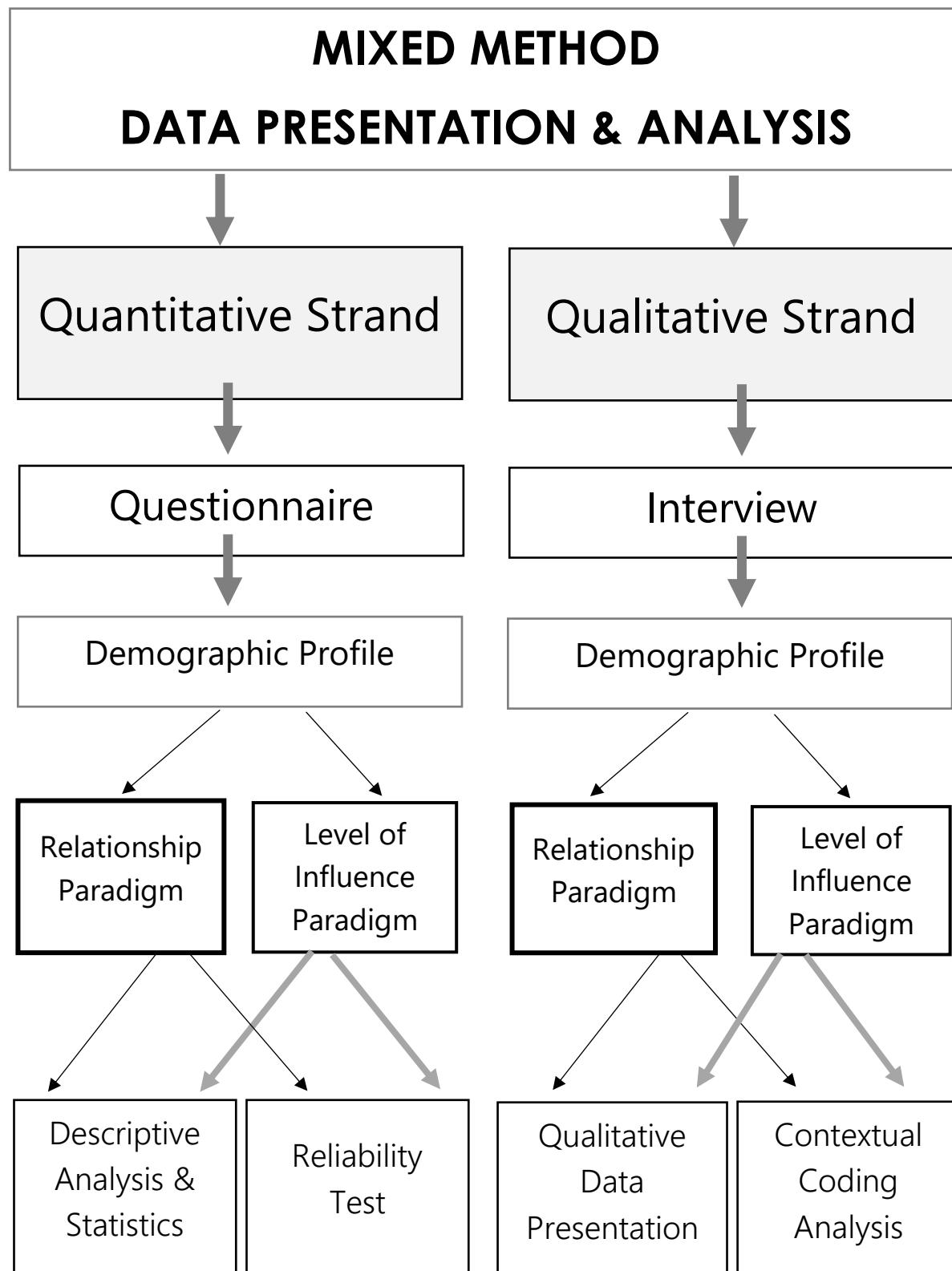
This chapter allocates importance to data presentation and analysis based on the data collected. Since this study adopts mixed methods, the data collected appears to be in two forms, namely, quantitative and qualitative.

Based on the convergent mixed method standards, the quantitative and qualitative data collected is required to be presented and analyzed separately. Thus, this chapter is split into two sections in which the first section presents and analyzes the quantitative strand by carrying out multiple tests specific to quantitative approach using SPSS software. Then, the chapter continues with the second section that presents and analyzes the qualitative strand by carrying out contextual coding analysis.

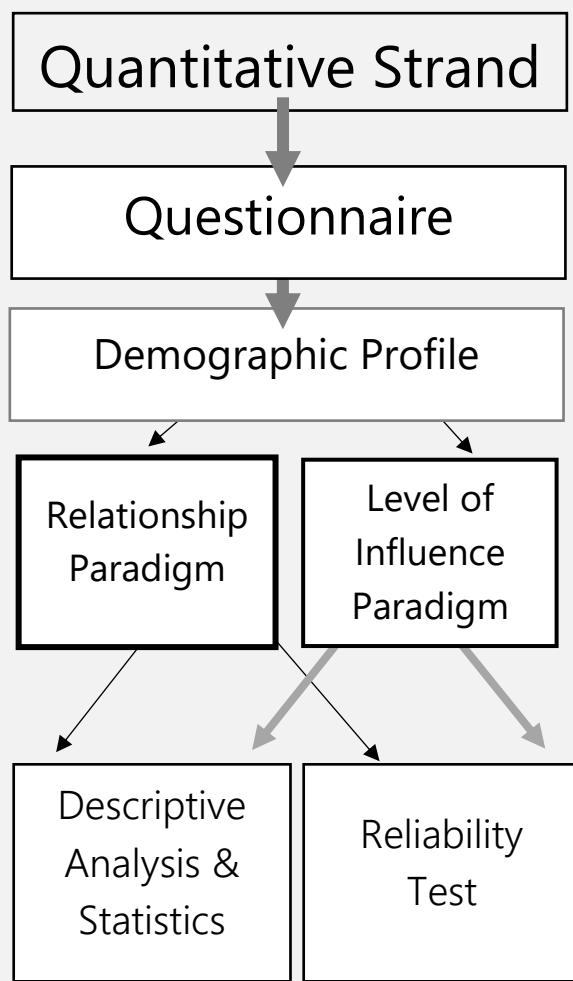
It is imperative to understand that the research carries out a study on one area only, but there are two paradigms in that area, which is the ‘Relationship Paradigm’ and “Level of Influence Paradigm”. The second paradigm is an extension of the first paradigm and both paradigm have to be studied and experimented one after another in order to provide a complete understanding of the phenomenon preached by the topic of this research study. The paradigms are related and cannot exist without each other. Thus, the quantitative and qualitative data presentation and analysis shall be performed for both paradigms, separately.

The format of this chapter is what governs the foundation of the presentation and analysis. This is imperative in order for the data presented and analyzed to become a solid platform in extracting vital components for articulating quantitative and qualitative findings in the next chapter.

The format of this chapter is illustrated in the next page. The readers are encouraged to closely read and understand the illustration to recognize the cohesion and coherence strategy adopted for this chapter.



QUANTITATIVE STRAND



4.1 Quantitative Data Presentation and Analysis

The quantitative strand is presented and analyzed based on the data collected from questionnaire survey which featured responses from 120 respondents who are accountants. The probability sampling using Roasoft required only 68 responses, but a total of 120 were received and taken for analysis to provide better findings. The questionnaire carried a total of 42 questions which were split into 3 important sections, namely, ‘the demographic profile’, ‘relationship paradigm’ and ‘level of influence paradigm’. Please view the table below for a better understanding of the questionnaire structure.

Questionnaire Sections	Number of Questions in Questionnaire
Demographic Profile	7
Relationship Paradigm	
Dependent Variable – Evolving Role of Accountants in the Accounting Profession	4
Independent Variable – Opportunity Creator (6 Factors)	12
Independent Variable – Threat Igniter (6 Factors)	11
Level of Influence Paradigm	
Tech Embracing Ability of Accountants (6 Abilities)	6
Additional Investigation: AI complement or replace Accountant?	1
Additional Investigation: The duration of the disruption?	1

The data collected from the questionnaire responses is presented and analyzed by carrying out multiple tests specific to quantitative approach using SPSS software. There are 3 important functions of the SPSS used to analyze the data, namely “Descriptive following ‘Mean’ (central tendency) Index”, “Descriptive Total Statistics following ‘Kurtosis’ and ‘Skewness’ Index” and “Reliability Test following Cronbach’s Alpha Index”. The following paragraphs present the quantitative data presentation and analysis distinctly.

4.1.1 Demographic Profile

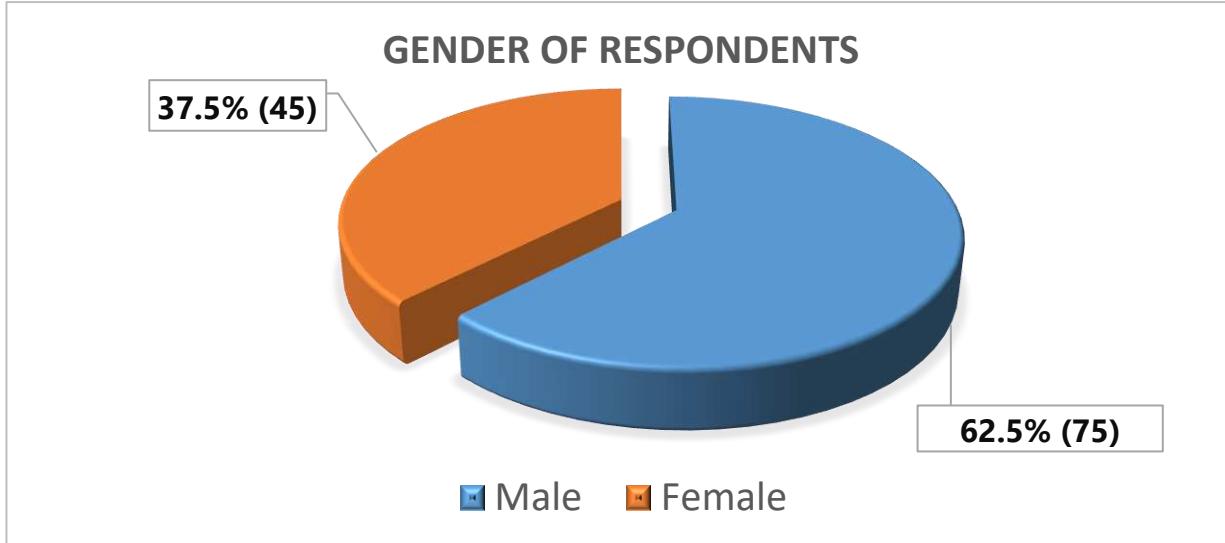
The following quantitative information resemble the demographic information of the respondents who participated in the questionnaire survey.

Table 4.1: Gender of Questionnaire Respondents

Gender					
Valid		Frequency	Percent	Valid Percent	Cumulative Percent
Male		75	62.5	62.5	62.5
Female		45	37.5	37.5	100.0
Total		120	100.0	100.0	

Source: Primary Data

Exhibit 4.1: Gender of Questionnaire Respondents



Source: Primary Data

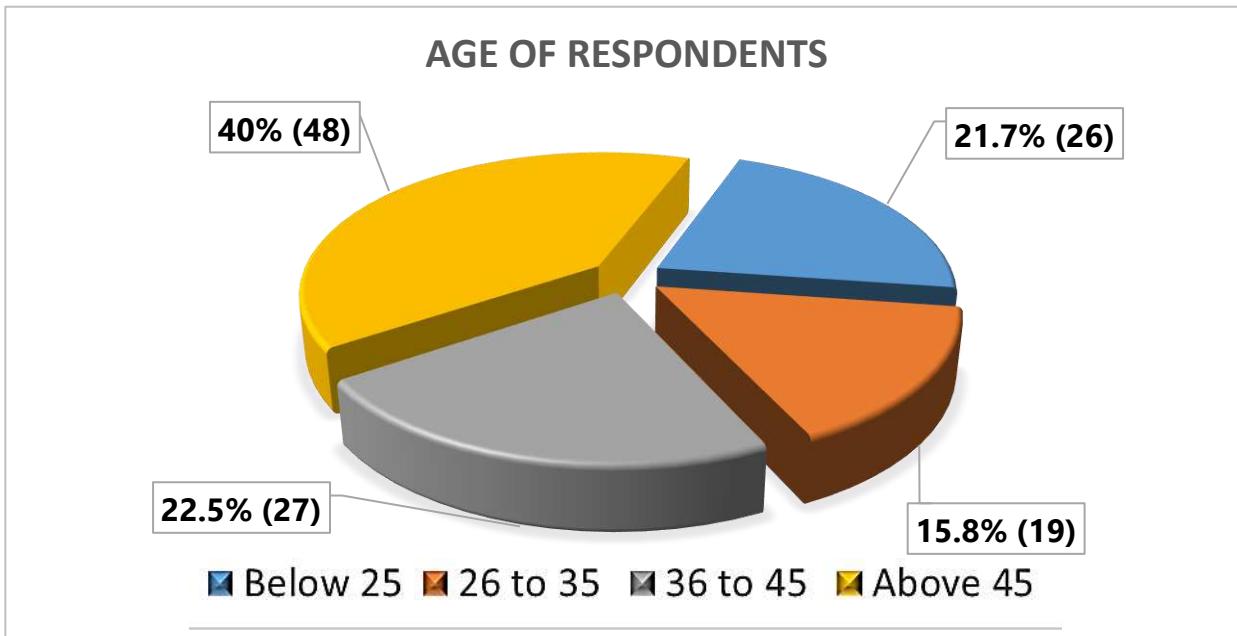
The Table 4.1 and Exhibit 4.1 illustrate in frequency and percentage the gender of respondents who participated in the questionnaire survey. The results show that 75 (62.5%) out of 120 respondents were male and the remaining 45 (37.5%) were female. Thus, it can be implied that the frequency of male is higher by 30 (25%) respondents than females.

Table 4.2: Age of Questionnaire Respondents

Age				
	Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Below 25	26	21.7	21.7
	26-35	19	15.8	37.5
	36-45	27	22.5	60.0
	Above 45	48	40.0	100.0
	Total	120	100.0	100.0

Source: Primary Data

Exhibit 4.2: Age of Questionnaire Respondents



Source: Primary Data

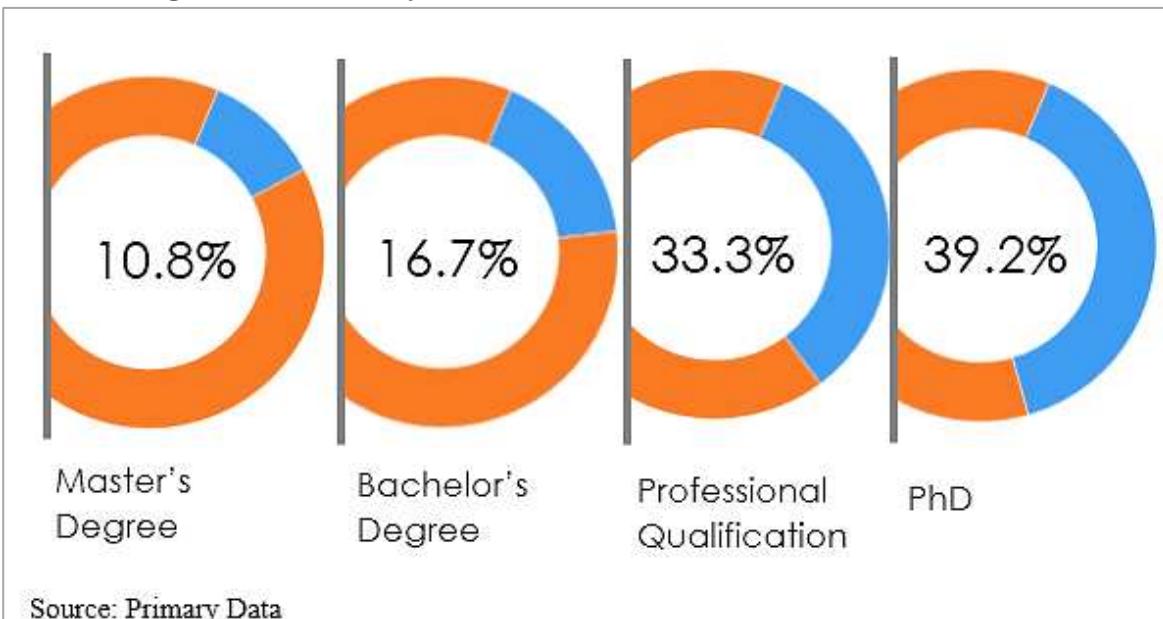
The Table 4.2 and Exhibit 4.2 illustrate in frequency and percentage the age of respondents who participated in the questionnaire survey. The results show that 48 (40%) out of 120 respondents were “Above 45”, followed by 27 (22.5%) “Between 36 to 45”, 26 (21.7%) “Below 25” and 19 (15.8%) “Between 26 to 35” years old. Thus, it can be implied that the frequency of the Accountants aged above 45 years were the highest and aged between 26 to 35 years were the lowest, leaving the other two age groups of below 25 and between 36 to 45 years to be at moderate.

Table 4.3: Highest Accountancy Qualification

Highest Accountancy Qualification					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Bachelor's Degree	20	16.7	16.7	16.7
	Professional Qualification	40	33.3	33.3	50.0
	Master's Degree	13	10.8	10.8	60.8
	PhD	47	39.2	39.2	100.0
	Total	120	100.0	100.0	

Source: Primary Data

Exhibit 4.3: Highest Accountancy Qualification



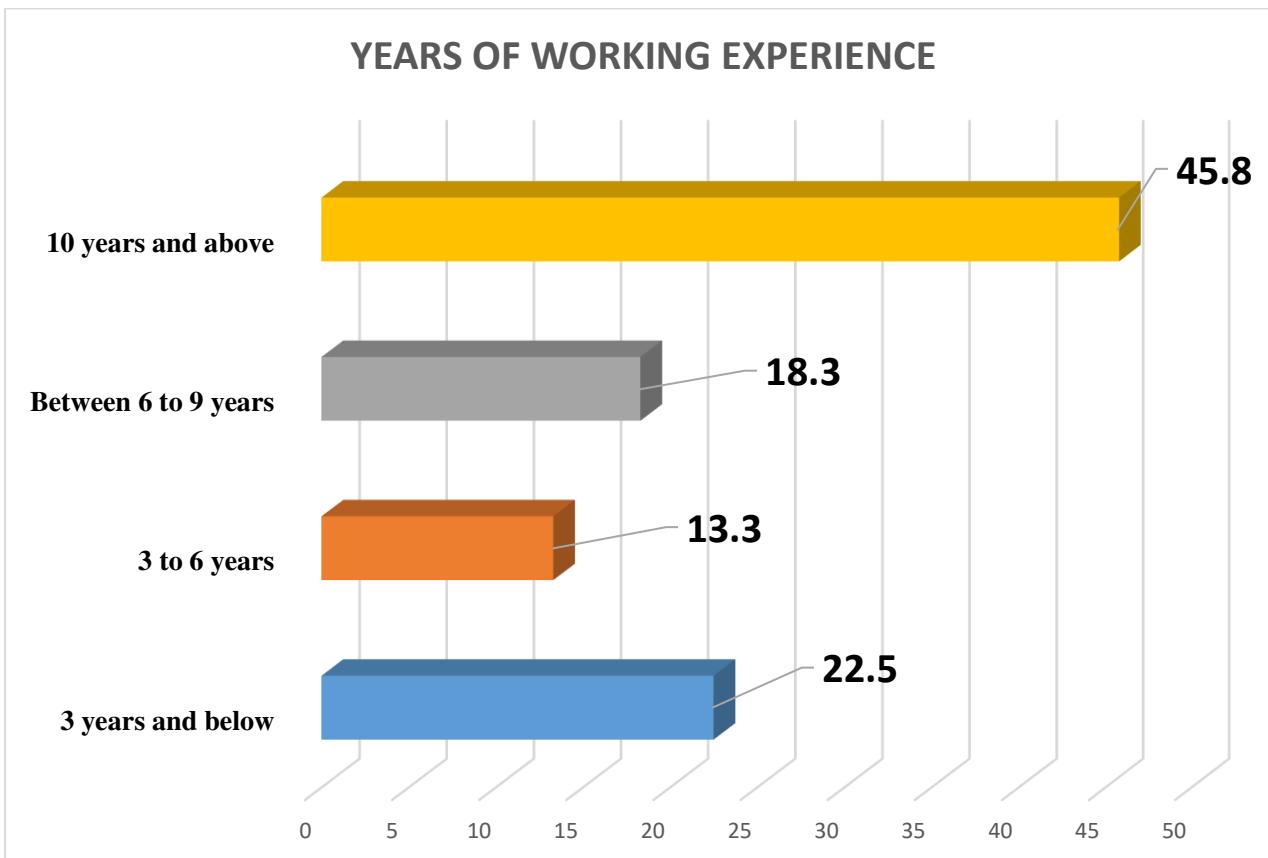
The Table 4.3 and Exhibit 4.3 illustrate in frequency and percentage the highest accountancy academic qualification of respondents who participated in the questionnaire survey. The qualifications appear in 4 sophisticated categories in which the most respondents appear to be PhD holders making 39.2% that is 45 out of 120 respondents. In just 5 respondents lesser, are the Professional Accountancy Qualification holders with 33.3% that is 40 out of 120 respondents. This is followed by 16.7% (20 respondents) with Bachelor's Degree and standing at the least of 10.8% (13 respondents) are the Master's Degree holders. Thus, it can be implied that experienced individuals with Doctorate in Philosophy and Professional Qualification have dominated the survey, showing a good credibility of the data collected.

Table 4.4: Years of Working Experience

Years of Working Experience					
	Frequency	Percent	Valid Percent	Cumulative Percent	
Valid 3 years and below	27	22.5	22.5	22.5	
Between 3 to 6 years	16	13.3	13.3	35.8	
Between 6 to 9 years	22	18.3	18.3	54.2	
10 years and above	55	45.8	45.8	100.0	
Total	120	100.0	100.0		

Source: Primary Data

Exhibit 4.4: Years of Working Experience



Source: Primary Data

Artificial Intelligence as a Paradoxical Digital Disruptor in the Accounting Profession.

The Table 4.4 and Exhibit 4.4 illustrate in frequency and percentage the years of working experience of respondents who participated in the questionnaire survey. The year range appear in 4 sophisticated categories in which the most respondents appear to have work experience of 10 years and above making 45.8% that is 55 out of 120 respondents.

Surprisingly, the second highest frequency appear to be at the far end, of 27 respondents that is 22.5% with merely 3 years and below of work experience. The remaining respondents appear to have experience between 6 to 9 years at 18.3% (22 respondents) and just 4 respondents lesser are individuals with 3 to 6 years of working experience, standing lowest at 13.3% (16 respondents).

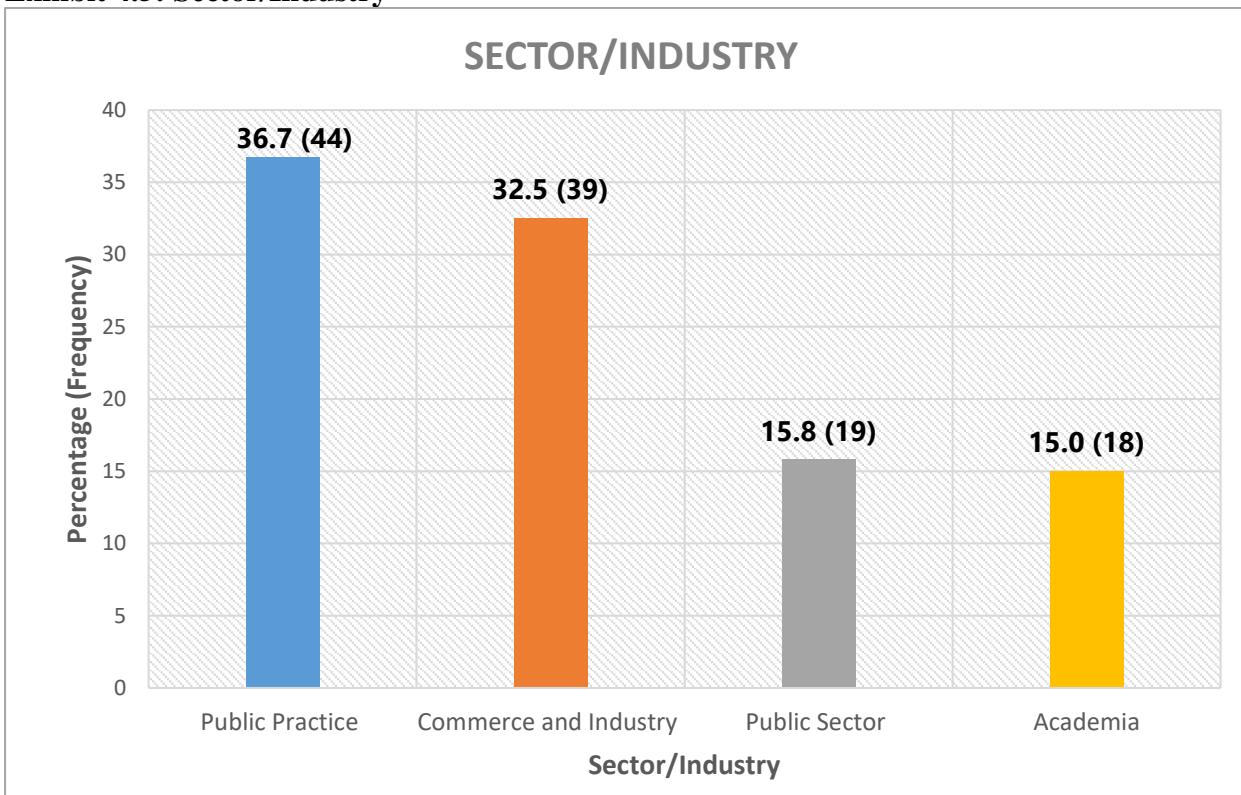
Thus, it can be implied, the survey has been significantly dominated by highly experienced Accountants who have spent more than 10 years in industry and by just 22.3% (28 respondents) lower are the newcomers in the industry who are low experienced individuals who have also dominated the survey. This shows that the data collected may have relevant answers of the olden and modern mixture.

Table 4.5: Sector/Industry

Sector/Industry					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Commerce and Industry	39	32.5	32.5	32.5
	Public Practice	44	36.7	36.7	69.2
	Public Sector	19	15.8	15.8	85.0
	Academia	18	15.0	15.0	100.0
	Total	120	100.0	100.0	

Source: Primary Data

Exhibit 4.5: Sector/Industry



Source: Primary Data

Artificial Intelligence as a Paradoxical Digital Disruptor in the Accounting Profession.

The Table 4.5 and Exhibit 4.5 illustrate in frequency and percentage the sector/industry from which the respondents who participated in the questionnaire survey, belong. The sector/industry appear in 4 sophisticated categories, according to the MIA Digital Technology Blueprint. The results show that most respondents appear to come from the public practice sector with 44 (36.67%) out of 120 respondents.

In just 5 respondents lesser, appear the individuals who come from the commerce and industry sector, with 39 (32.5%) out of 120 respondents. Surprisingly, the remaining respondents coming from the other two sectors are far away from the frequency and percentage of the first two sectors.

This can be seen where merely 19 (15.8%) and 18 (15.0%) respondents come from public sector and academia, respectively. This is lower by 25 (20.87%) and 26 (21.67%) respondents than respondents from public practice; and lower by 20 (16.7%) and 21 (17.5) respondents than respondents from commerce and industry.

Thus, it can be implied, that regardless of the disparity with 2 industries with high frequency and 2 industry with low frequency, there is a good mixture of individuals from all sectors, which make the data collected to be holistic, as it inhibits responses from Accountants that come from all four industrial perspectives.

**QUANTITATIVE DATA
PRESENTATION & ANALYSIS**

for

RELATIONSHIP PARADIGM

4.1.2.1 Descriptive Analysis – Relationship Paradigm

The following information resemble the descriptive results obtained after analyzing the questionnaire data using SPSS software. The data is presented in a table format featuring each question and its respective frequencies, percentages and mean. The “mean” (or average) is the most significant value from the descriptive statistics as it is going to be the leading value used to analyze and interpret the data presented. This is because “mean” is the only value that incorporates all the results of all the data points (per question) and then derives the central tendency of the data in a question – which shows the status of the results per question on an average. This is an ideal and accurate approach as it does not favor extreme high or low values, rather encompasses all values and preaches an average.

The data points resemble the Likert Scale points in which respondents express their opinion by indicating the degree of disagreement and agreement for each statement in the questionnaire. The Likert Scale is a scale of points in numerical value from 1 to 5 – in which the numbers represent:

Likert Scale Numerical Points	Interpretation
1	Strongly Disagree
2	Disagree
3	Neutral
4	Agree
5	Strongly Agree

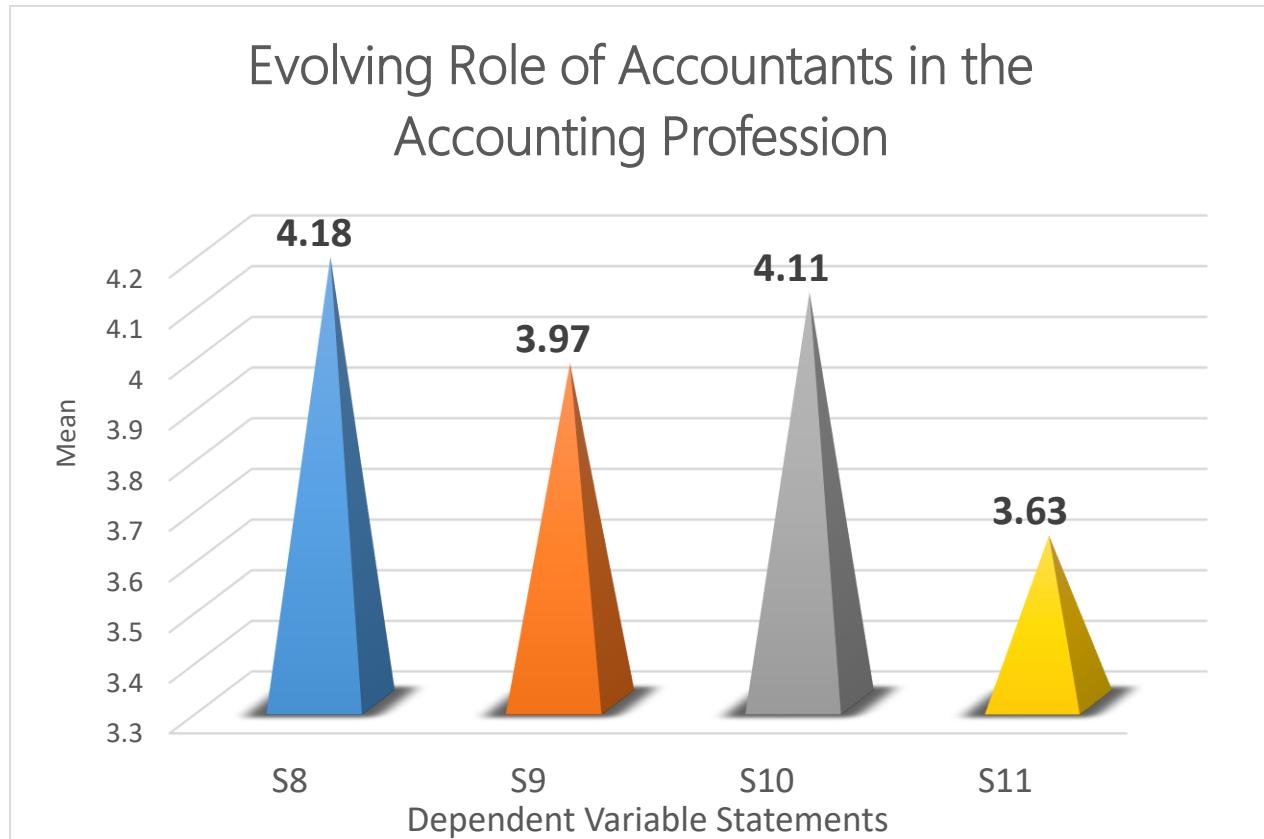
Table 4.7: Dependent Variable – Evolving Role of Accountants in Accounting Profession

Code “S” for Statement

Evolving Role of Accountants in AP	Number of Respondents in Frequency and Percentage					Sum	Mean	Total
	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree			
S8: The AP is at the position of experiencing a cycle of evolution empowered by digitalization.	6 5%	7 5.8%	11 9.2%	31 25.8%	65 54.2%	502	4.18	120 100%
S9: The AP stands at an opportunity to be complemented, but at risk of being replaced by AI.	8 6.7%	9 7.5%	15 12.5%	35 29.2%	53 44.2%	476	3.97	120 100%
S10: If Accountants are to embrace AI, they are likely to enjoy a positive impact on their roles, if not, vice versa.	3 2.5%	9 7.5%	10 8.3%	48 40.0%	50 41.7%	493	4.11	120 100%
S11: It is a common psychology for Accountants to fear and resist AI in the beginning than to embrace it.	14 11.7%	15 12.5%	13 10.8%	38 31.7%	40 33.3%	435	3.63	120 100%

Source: Primary Data

Exhibit 4.7: Dependent Variable – Evolving Role of Accountants in Accounting Profession



Source: Primary Data

The Table 4.6 and Exhibit 4.6 illustrate frequency and percentage, and mean from the response of the respondents pertaining the extent of their agreement towards the dependent variable (DV) that is “the evolving role of accountants in the accounting profession (AP)”. There are 4 statements for the DV that emphasize on how the role of accountants is evolving from being influenced by artificial intelligence (AI) as a digital disruptor.

The results show that the highest mean is 4.18 for S8 and by just 0.07 lesser is the second highest mean of 4.11 at S10. This means majority of the respondents have prioritized and agreed that the roles of accountants are going to evolve due to digitalization and subsequently have also recognized that it is in the hands of accountants in terms of how they want to be influenced by digitalization.

Artificial Intelligence as a Paradoxical Digital Disruptor in the Accounting Profession.

Concurrently, with a mean of 3.97 for S9, it shows the respondents have significantly accepted that with digitalization, the AP shall be influenced by digitalization favorably by being complemented in their work and adversely by being having their roles replaced. They have least agreed with S11 that possesses a lowest mean of 3.63 where accountants will be influenced by digitalization but they may not fear it initially before embracing it, but would rather embrace it, as there are already accountants embracing digitalization.

Thus, from all the 4 statements, the average mean would be 3.97 which shows how respondents have significantly agreed how the evolving role of accountant is dependent on digitalization and how it is at the position of being influenced disruptively.

Table 4.8: Independent Variable 1 – Artificial Intelligence as Opportunity Creator

Abbreviation in use: “S” for Statement

AI as Opportunity Creator through 6 Mini IVs	Number of Respondents in Frequency and Percentage					Sum	Mean	Total
	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree			
DECISION SUPPORT								
S12: The idea of AI replicating human reasoning to help you make better inference-based decisions is a good thing.	8 6.7%	11 9.2%	16 13.3%	43 35.8%	42 35.0%	460	3.83	120 100%
S13: The idea of AI assisting you in ensuring technical decision making is free from biasness is a good thing.	4 3.3%	12 10.0%	17 14.2%	35 29.2%	52 43.3%	479	3.99	120 100%
INTERACTIVE LEARNING & TEACHING								
S14: I like working in an environment where: - AI completes monotonous and time consuming task for me – like journal entry validation.	2 1.7%	7 5.8%	15 12.5%	48 40.0%	48 40.0%	493	4.11	120 100%

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S15: I like working in an environment where: - AI identifies errors in my work, teaches me corrective action and trains me on particular subject matter.	2 1.7%	7 5.8%	13 10.8%	44 36.7%	54 45.0%	501	4.18	120 100%
INTELLECTUAL CAPITAL & EXPERTISE STORING								
S16: AI helps preserve secret tactics developed by my team for future projects. This is a positive aspect towards faster and better quality work.	1 0.8%	6 5.0%	9 7.5%	48 40.0%	56 46.7%	512	4.27	120 100%
DIGITAL MANAGEMENT								
S17: AI gives me opportunity to improve my tech-skills; thereby elevating my ability to work hand-in-hand with AI.	4 3.3%	10 8.3%	9 7.5%	42 35.0%	55 45.8%	494	4.12	120 100%
S18: Working with AI, accountants would be collaborators of technology rather than passive users of software.	5 4.2%	12 10.0%	11 9.2%	39 32.5%	53 44.2%	483	4.03	120 100%

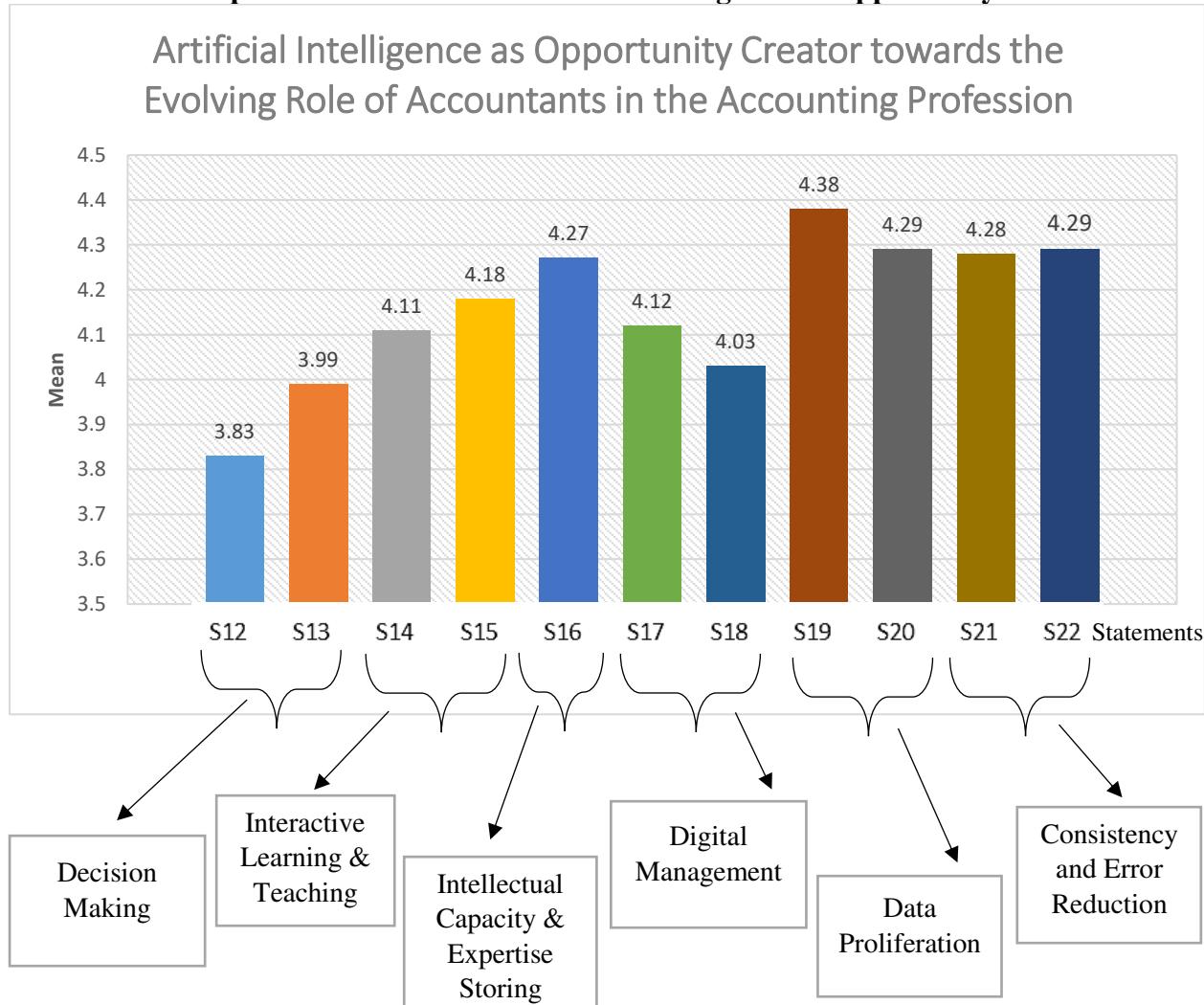
DATA PROLIFERATION								
S19: With AI being able to read through large volumes of text in short time, it not only saves time but helps concentrate on other important decision making areas.	3	3	5	44	65	525	4.38	120
	2.5%	2.5%	4.72%	36.7%	54.2%			100%
CONSISTENCY & ERROR REDUCTION								
S21: With AI ensuring same depreciation method is used yearly, it helps comparability of financial results and fosters better decision making.	1	4	11	49	55	513	4.28	120
	0.8%	3.3%	9.2%	40.8%	45.8%			100%

Artificial Intelligence as a Paradoxical Digital Disruptor in the Accounting Profession.

S22: Since AI is a machine, it escapes tiredness, boredomness and biasness. This would reduce human error and chances of high material misstatements.	2	6	8	43	61	515	4.29	120
	1.7%	5.0%	6.7%	35.8%	50.8%			100%

Source: Primary Data

Exhibit 4.8: Independent Variable 1 – Artificial Intelligence as Opportunity Creator



Source: Primary Data

Artificial Intelligence as a Paradoxical Digital Disruptor in the Accounting Profession.

The Table 4.8 and Exhibit 4.8 illustrate frequency and percentage, and mean from the response of the respondents pertaining the extent of their agreement towards the first independent variable (IV1) that is “AI as an opportunity creator”. This IV has 6 mini IVs or proxies that are used to truly describe and resemble the nature of “opportunity creator”. Each of the 6 mini IVs have their statements. Thus, the extent of the respondent’s agreement towards the IV1 is through these 6 mini IVs. A total of 11 statements (S12 to S22) were prepared to resemble the 6 mini IVs to investigate if AI favorably influences the evolving role of accountants in the AP via creating opportunities.

Decision making was tested using 2 statements. The highest mean is 3.99 for S13 which has been strongly agreed by 43.3% of the respondents, showing how respondents have significantly agreed towards the idea of AI being able to favorably influence the role of accountants by ensuring technical decision making is free from biasness. This is followed by a mean of 3.83 for S12 showing how majority of the respondents are in the favor that accountants will definitely be able to benefit from AI especially if AI helps accountants make better inference-based decisions via replicating human reasoning. Despite there are almost 4 to 12 and 8 to 11 out of 120 respondents who disagreed with the statement 13 and 12 respectively. This may be due to respondents believing decision-making is the epitome of accountant’s role and that should only be done by human without digital intervention. Regardless, it can still be deduced that in a holistic view, AI favorably influences the evolving role of accountants in the AP via creating opportunities in the accountant’s decision making paradigm. This is because there are certain aspects of an accountant’s decision-making that may not be accurately and proficiently carried, and can be performed with help of AI.

Interactive learning and teaching was tested using 2 statements. The highest mean is 4.18 for S15 which has been agreed and strongly agreed by 36.7% and 45% of the respondents, respectively. This is followed by second highest mean of 4.11 for S14 which has been agreed and strongly agreed by 40% of the respondents. These results show how respondents have significantly agreed to prefer to work in an environment where AI identifies errors in work, teaches corrective action and trains on particular subject matter, whilst completing monotonous and time consuming task. There are only a handful of 10 respondents for each statement that disagreed to work in this environment. Thus, it can be deduced that in a holistic view, AI favorably influences the evolving role of accountants in the AP via creating opportunities in the accountant’s learning paradigm.

Intellectual capacity and expertise storing was tested using 1 statement, because it was sufficient to test the gist of the intellectual expertise and storing capacity of AI. The mean obtained is 4.27 for S16 with 40% and 46.7% agreeing and strongly agreeing to the statement respectively. This result shows how respondents are highly supportive to the concept of AI helping to preserve secret tactics developed by team of accountants when carrying out projects. This is because, these respondents hold high preference for secret tactics preservation because they want their tactics to be used in future projects, thereby allowing projects to be executed at faster pace and to obtain results that are high quality. There were only 1 to 6 (0.8% to 5.0%) out of 120 respondents who disagreed with S16, probably due to their job descriptions not involving an emphasis on engagement teams, projects and tactic development. Thus, it can be deduced that in a holistic view, AI favorably influences the evolving role of accountants in the AP via creating opportunities in the accountant's engagement teams, projects and tactic development paradigm.

Digital management was tested using 2 statements. The highest mean is 4.12 for S17 and the second highest mean is 4.03 for S18. These statements were significantly agreed and strongly agreed by 42 to 55 (35.0% to 45.8%) and 39 to 53 (32.5% to 44.2%) out of 120 respondents – which shows that respondents are in favor of believing how AI positively influences accountants and the AP by encouraging them to improve their tech-skills and be collaborators of technology rather than mere passive users of software. These statements were only disagreed by 11.6% and 14.2% that is 14 and 17 out of 120 respondents as they might still be using software and their tech-skills may not necessarily be AI-centered. This is a good thing, as it shows how an array of different perspective-based accountants took part in the survey. Thus, it can be deduced that in a holistic view, AI favorably influences the evolving role of accountants in the AP via creating opportunities in the accountant's digital management paradigm, which allows accountants to work hand-in-hand with AI.

Data proliferation was tested using 2 statements. The highest mean is 4.38 for S19 with more than 50%, that is 54.2% (65 respondents) to be exact, who have strongly agreed to the statement, with only 5% (6 respondents) disagreeing. This shows that respondents are supportive of accepting AI to positively influence the role of accountants by helping accountants read through large volumes of text in short time so that accountants can concentrate on other important decision-making areas. This is followed by a mean of 4.29 with almost 50% that is 48.3% (58 respondents) to be exact, who have strongly agreed to the statement, with only 5.8% (7 respondents) disagreeing in total. This shows that respondents are supportive of accepting AI to positively influence the role of accountants by helping accountants increase understandability and transparency in financial reporting. The 5% and 5.8% disagreeing for both statements, respectively, may be due to their position not requiring to scan large volumes of text and make organization-wide decisions. Thus, it can be deduced that in a holistic view, AI favorably influences the evolving role of accountants in the AP via creating opportunities in the accountant's data-intensive paradigm.

Consistency and error reduction was tested using 2 statements. The means obtained are 4.29 and 4.28 for S22 and S21 respectively. This shows that on an average, the respondents have strongly agreed to the concept of AI being able to foster consistency and reduce errors in the work of the accountants. This is nothing but an interesting way of how the roles are accountants in the AP shall be influenced and evolve favorably. The results disclose that 43 to 61 (35.8% - 50%) and 49 to 55 (40.8% - 45.8%) out of 120 respondents have strongly agreed to S22 and S21 respectively showing how the respondents are supportive for AI helping accountants maintain same depreciation method annually for ease comparability and do repetitive work proficiently allowing the accountants work to be free from errors. Thus, it can be deduced that in a holistic view, AI favorably influences the evolving role of accountants in the AP via creating opportunities via consistency and fostering low material misstatements in the accountant's working paradigm.

Table 4.10: Independent Variable 2 – Artificial Intelligence as Threat Igniter

Abbreviation in use: “S” for Statement

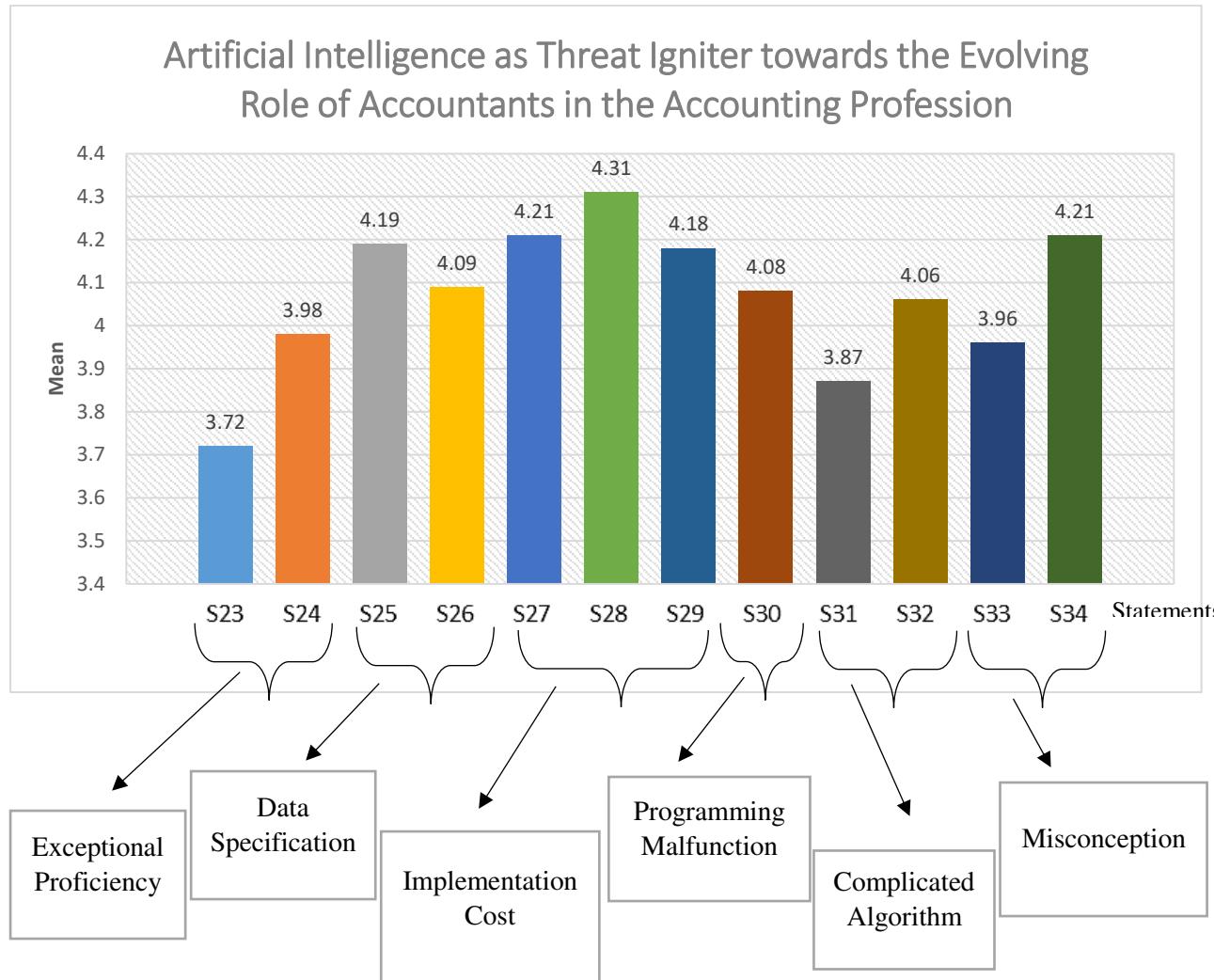
AI as Threat Igniter through 6 Mini IVs	Number of Respondents in Frequency and Percentage					Sum	Mean	Total
	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree			
	EXCEPTIONAL PROFICIENCY							
S23: AI performs accounting tasks proficiently and effortlessly. This has high potential of increasing redundancy.	10 8.3%	14 11.7%	14 11.7%	44 36.7%	38 31.7%	446	3.72	120 100%
S24: In the near future, accountants may face difficulty getting employed if they omit to have necessary tech-skills.	4 4.2%	14 11.7%	13 10.8%	35 29.2%	53 44.2%	477	3.98	120 100%
DATA SPECIFICATION								
S25: Quantity and quality of data programmed into AI is important in order for AI to lead accountants make right decisions.	4 3.3%	8 6.7%	8 6.7%	41 34.2%	59 49.2%	503	4.19	120 100%

S26: AI may grant similar solutions to different problems. If accountants omit to check its relevance, the accounting work will lack significance.	4 3.3%	7 5.8%	14 11.7%	44 36.7%	51 42.5%	491	4.09	120 100%
IMPLEMENTATION COST								
S27: Implementation of customized AI in different Accounting area may require additional funding that firms may have not budgeted before.	2 1.7%	7 5.8%	9 7.5%	48 40.0%	54 45.0%	505	4.21	120 100%
S28: Dealing with AI requires Accountants to obtain training pertaining AI-management. This is additional cost for companies.	3 2.5%	5 4.2%	12 10.0%	32 26.7%	68 56.7%	517	4.31	120 100%
S29: If companies do not begin allocating reserves for digital funding, they are at great risk.	4 3.3%	7 5.8%	12 10.0%	37 30.8%	60 50.0%	502	4.18	120 100%

PROGRAMMING MALFUNCTION								
S30: The Accountants are at great risk when AI-system malfunctions and data cannot be retrieved.	4 3.3%	14 11.7%	12 10.0%	28 23.3%	62 51.7%	490	4.08	120 100%
COMPLICATED ALGORITHMS								
S31: I would reject using AI if I have no clue how to explain the results derived by AI	6 5.9%	7 14.2%	13 10.8%	35 29.2%	49 40.8%	464	3.87	120 100%
S32: I would reject using AI if I cannot rely on data processed by AI.	7 5.8%	9 7.5%	13 10.8%	32 26.7%	59 49.2%	487	4.06	120 100%
MISCONCEPTION								
S33: AI confuses accountant whether to probe, question and challenge ‘ethical’ facets or follow so called ‘accurate’ results of AI.	8 6.7%	7 5.8%	18 15.0%	36 30.0%	51 42.5%	475	3.96	120 100%
S34: As an Accountant, I would reject using AI if decisions suggested by it compromise my ethical independence.	5 4.3%	7 5.8%	13 10.8%	28 23.3%	67 55.8%	505	4.21	120 100%

Source: Primary Data

Exhibit 4.10: Independent Variable 2 – Artificial Intelligence as Threat Igniter



Source: Primary Data

The Table 4.10 and Exhibit 4.10 illustrate frequency and percentage, and mean from the response of the respondents pertaining the extent of their agreement towards the second independent variable (IV2) that is “AI as threat igniter”. This IV has 6 mini IVs or proxies that are used to truly describe and resemble the nature of “threat igniter”. Each of the 6 mini IVs have their statements. Thus, the extent of the respondent’s agreement towards the IV2 is through these 6 mini IVs. A total of 12 statements (S23 to S34) were prepared to resemble the 6 mini IVs to investigate if AI adversely influences the evolving role of accountants in the AP via igniting threats.

Exceptional proficiency was tested using 2 statements. The mean obtained is 3.98 and 3.72 for S24 and S23, respectively. Both of the means are high and only at a difference of 0.26. This shows that majority of the respondents with 35 to 53 (29.2% to 44.2%) and 38 to 44 (31.7% to 36.7%) out of 120 respondents have shown significant agreement towards S24 and S23, respectively. It can be implied that respondents recognize the exceptional proficiency of AI to be a hindrance to the evolving role of accountants in the AP as with AI, if the accountant omit to have necessary tech-skills, then they may have difficult to get employed and that this is followed by increasing redundancy. There were only a handful of respondents of 18 (15.9%) and 24 (20%) out of 120 respondents who chose to disagree with S24 and S23 probably due to their jobs being difficult to replace by AI and that they already have the necessary tech-skills to secure their employment. Regardless, it can be deduced that in a holistic view, AI adversely influences the evolving role of accountants in the AP via being exceptionally proficient that it jeopardizes continuity of AP.

Data specification was tested using 2 statements. The highest mean is 4.19 for S25 with 41 (34.2%) and 59 (49.2%) out of 120 respondents agreeing and strongly agreeing to S25. This shows that respondents are supportive pertaining specification of data, where if data is not specified in terms of its quantity and quality when programming into AI, it could lead accountants taking wrong decisions. The second highest mean is 4.09 for S26 with 44 (36.7%) and 51 (42.5%) out of 120 respondents agreeing and strongly agreeing to S26. This shows that respondents recognize how the significance of an accountant’s work can be threaten by AI providing similar solutions to different problems that may not be relevant for all the problems accountants face. Thus, it can be deduced that in a holistic view, AI adversely influences the evolving role of accountants in the AP via needing specific data without which it could mislead accountant’s decision-making.

Implementation cost was tested using 3 statements. The highest mean is 4.31 for S28 followed by 4.21 and 4.18 for S27 and S29. There is a range of approximately 26% to 56%, totaling of almost 32 to 68 respondents for S27 to S29, all favoring how AI threaten accountants and accounting firms through its high digital funding. This shows that majority of the respondents have agreed S28 that with AI, companies are going to incur additional cost due to the additional AI training to be arranged for the accountants. Subsequently, respondents highlighted how companies may have not budgeted for digital implementation especially for implementing customized AI in different accounting areas, which will be an additional investment expenditure in their budget, via S27. Lastly, with S29, respondents agree to recognize how companies are going to be at great risk if they omit to allocate reserves for digital funding. There is only a handful of respondents ranging from 3 to 7 (2.5% to 5.8%) people approximately from each of the statements that disagreed pertaining implementation cost threatening the evolving role of accountants in the AP. This could be due to their companies backed with good digital funding for the digital disruption of IR4.0. Thus, it can be deduced that in a holistic view, AI adversely influences the evolving role of accountants via its implementation cost being a major hindrance for accountants and AP to embrace AI.

Programming malfunction was tested using 1 statement because it was sufficient to test the gist of the malfunction of AI. The mean obtained is 4.08 for S30 with 62 (51.7%) out of 120 respondents strongly agreeing and only 4 to 14 (3.3% to 11.7%) of respondents disagreeing S30. This shows that respondents are recognize how AI shall threaten accountants when AI system malfunction and that data cannot be retrieved. The disagreeing respondents may belief the back-up data, but with AI, there are not many servers to have its data backed-up elsewhere. Thus, it can be deduced that in a holistic view, AI adversely influences the evolving role of accountants via its programming malfunction being a major hindrance knowing accountancy is a data-intensive profession.

Complicated algorithm was tested using 2 statements. The highest mean is 4.06 for S32 showing how respondents have agreed from range of 26.7% to 49.2% that is total of 39 and 59 respondents agreeing to S32 where they would reject using AI if the data produced by AI is not reliable. The second highest mean is 3.87 showing how respondents have agreed from range of 29.2% to 40.8% that is total of 35 and 49 respondents agreeing to S31 where they would reject using AI if they have no clue how to evaluate the results derived by AI. Thus, it can be deduced that in a holistic view, AI adversely influences the evolving role of accountants via its algorithm complexity, thereby hindering accountants and AP to embrace AI.

Misconception was tested using 2 statements. The highest mean is 4.21 for S34 showing how respondents have agreed from range of 23.3% to 55.8% that is total of 28 and 67 respondents agreeing to S34 where they would reject using AI if decision suggested by AI compromise ethical independence. The second highest mean is 3.96 showing how respondents have agreed from range of 30.0% to 42.5% that is total of 36 and 51 respondents agreeing to S33 where they would reject using AI if AI confuses them whether to probe, question and challenge ‘ethical’ facets or follow so called ‘accurate’ results of AI. Thus, it can be deduced that in a holistic view, AI adversely influences the evolving role of accountants igniting misconceptions in accountant’s minds, thereby hindering accountants and AP to embrace AI.

Table 4.12: Descriptive Statistics for Relationship DV and IV Variables

	Descriptive Statistics									
	N	Minimum	Maximum	Mean		Std. Deviation	Skewness		Kurtosis	
Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Statistic	Std. Error	Statistic	Std. Error	
DV_Evolving Role of Accountants in the Accounting Profession	120	2.25	5.00	3.9708	.06014	.65880	-.603	.221	-.125	.438
IV_Opportunity_Creator_Decision_Support	120	1.00	5.00	3.9125	.09948	1.08980	-.916	.221	-.055	.438
IV_Opportunity_Creator_Interactive_Learning and Teaching	120	1.00	5.00	4.1417	.08117	.88921	-1.323	.221	1.590	.438
IV_Opportunity_Creator_Intellectual_Capital and Expertise_Storing	120	1.00	5.00	4.2667	.07915	.86708	-1.335	.221	1.799	.438
IV_Opportunity_Creator_Digital_Management	120	1.00	5.00	4.0708	.09528	1.04378	-1.268	.221	.826	.438
IV_Opportunity_Creator_Data_Proliferation	120	1.00	5.00	4.3333	.07493	.82077	.907	.221	.200	.438
IV_Opportunity_Creator_Consistency and Error Reduction	120	1.00	5.00	4.2833	.07408	.81151	-1.477	.221	.509	.438
IV_Threat_Igniter_Exceptional_Proficiency	120	1.00	5.00	3.8458	.10021	1.09774	-.931	.221	.100	.438
IV_Threat_Igniter_Data_Specification	120	1.00	5.00	4.1417	.08860	.97054	-1.439	.221	1.954	.438
IV_Threat_Igniter_Implementation_Cost	120	1.33	5.00	4.2333	.07984	.87458	.572	.221	.417	.438
IV_Threat_Igniter_Programming_Malfunction	120	1.00	5.00	4.0833	.10755	1.17812	-1.105	.221	.068	.438
IV_Threat_Igniter_Comlicated_Algorithm	120	1.00	5.00	3.9625	.10571	1.15802	-1.084	.221	.200	.438
IV_Threat_Igniter_Misconception	120	1.00	5.00	4.0833	.09943	1.08916	-1.324	.221	.980	.438
Valid N (listwise)	120									

Source: Primary Data

According to Creswell (2014), descriptive statistics produced by SPSS is the summary of the data collected in terms of its central tendency, variability and normality deviation pertaining all the variable distribution. An emphasis is given to skewness and kurtosis. Skewness is a descriptive statistic that measures distribution asymmetry whereas kurtosis measures the degree to which value distributes around the middle point. The normality values are typically accepted between -2 and +2, which are also accepted as favorable for the skewness and kurtosis measurements.

The Table 4.12 illustrate that the dependent variable which is the evolving role of accountants in the AP has -0.603 and -0.125 for skewness and kurtosis, respectively, which is acceptable. Moreover, pertaining the independent variable, it can be observed that all the values of the 12 variables are favorable as the statistics of skewness and kurtosis are within the range of -2 to +2.

4.1.2.2. Reliability Test for Dependent and Independent Variables

Table 4.13: Reliability Test for Dependent and Independent Variables

Variables	Number of Items	Likert Scale	Cronbach's Alpha
Dependent Variable – Evolving Role of Accountants in the Accounting Profession	4	1-5	0.863
Independent Variable – Opportunity Creator			
-Decision Support	2	1-5	0.886
-Interactive Learning and Teaching	2	1-5	0.887
-Intellectual Capacity and Expertise Storing	1	1-5	0.890
-Digital Management	2	1-5	0.881
-Data Proliferation	2	1-5	0.888
-Consistency and Error Reduction	2	1-5	0.888
Total Cronbach's Alpha:			0.819
Independent Variable – Threat Igniter			
-Exceptional Proficiency	2	1-5	0.879
-Data Specification	2	1-5	0.876
-Implementation Cost	3	1-5	0.879
-Programming Malfunction	1	1-5	0.884
-Complicated Algorithm	2	1-5	0.888
-Misconception	2	1-5	0.887
Total Cronbach's Alpha:			0.820
Overall Cronbach's Alpha			0.894
Reliability Statistics			
Cronbach's Alpha	N of Items		
.894	13		

The Reliability Test is conducted to evaluate the dependability of data distributed and to ascertain if the results obtained are continuously consistent. This is possible when the Reliability Test measures the consistency of each variable (Creswell, 2014). To do this, the test is typically performed using the Cronbach Alpha index that will accurately determine the reliability and validity of the questions inserted in the questionnaire. However, it is imperative to follow the doctrine of Cronbach Alpha that specifically states that the outcome of the test must be in numeric values between 0 to 1 only and that the data supplied is significantly considered to be reliable when it is >0.70 or <0.90 . Any results below 0.70 would mean there is low number of questions and that there is poor relation between them, whereas, any results above 0.90 would mean there is high number of questions, which eventually cause redundancy. This is because, according to Creswell (2014), Cronbach Alpha is deduced majorly based on length of test and questionnaire data dimensionality.

The Table 4.13 illustrates that the dependent variable has a Cronbach's Alpha of 0.863, followed by all the opportunity creating and threat igniting independent variables to be smaller than 0.90 and not less than 0.70, with total Cronbach's Alpha of 0.819 and 0.820, respectively. This shows that all the variable are within the Cronbach's Alpha required range and that adhere to the doctrine of Cronbach Alpha. The total Cronbach's Alpha derived is 0.894, which shows that all the variables are acceptable and reliable, with a significant continuous consistency.

QUANTITATIVE DATA PRESENTATION & ANALYSIS

for

LEVEL OF INFLUENCE

PARADIGM

4.1.3 Level of Influence Paradigm

The level of influence paradigm is the second paradigm identified in the area of this research study. This is because it resembles an extension of the first paradigm. This paradigm is best dictated based on third objective of this study.

The first and second objectives relate to addressing the paradoxical digital disrupting nature of AI that is specifically its ‘Opportunity Creating’ and “Threat Igniting” dimensions. It is this point of the research where the researcher bring in **the third objective** which intends to investigate the level of influence of AI on AP in terms of whether AI is to more positively or more negatively impact AP. Thus the researcher adopts the most accurate medium to measure and reveal the significant level of influence – that is the “Tech-Embracing Ability of Accountants”. There are 6 tech-embracing abilities (TEA) identified by the researcher that appear to be the top capabilities needed for accountants in embracing AI. This means the true impact of AI on AP lies in the hands of the accountants.

The doctrine of Tech-Embracing Ability preaches that the level of positive and negative influence of AI on AP is likely to be decided based on the tech-capabilities of Accountants. This means the accountants have to have these 6 (at least) capabilities in order to ensure they are on-track and have strong readiness towards embracing digitalization and AI, and if they have, it means they are to embrace AI and are likely to enjoy a positive impact, thereby having AI to have a higher degree of positive and favorable, opportunity-creating influence on AP, rather than adverse, threat-igniting influence.

In strategizing the pursuance to meet the objective, a sophisticated research question is asked – where if the research question is precisely answered, then the objective is fulfilled. In this section, quantitative data is collected, presented and analyzed for determining the findings to settle hypothesis, answer research question, meet research objectives and solve research problem.

4.1.3.1 Descriptive Analysis for Tech-Embracing Ability Variables

Table 4.14: Level of Influence of AI on AP via Accountant's Tech-Embracing Ability

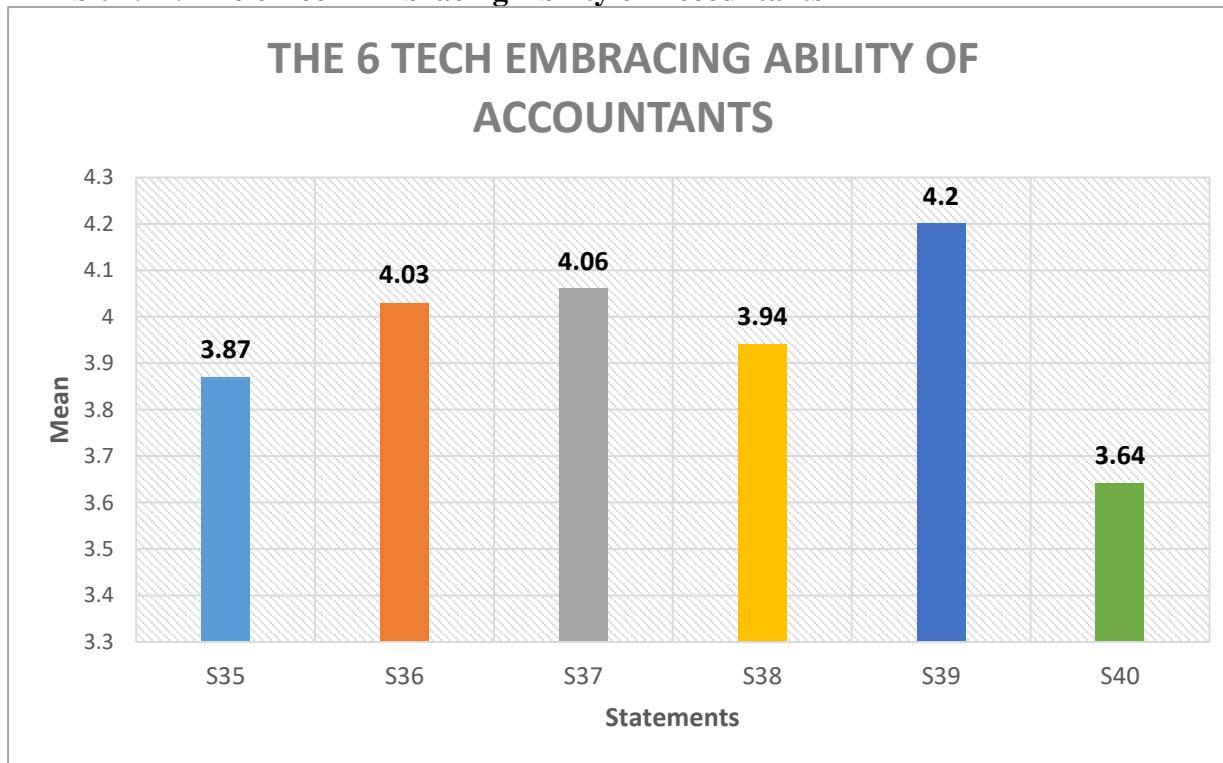
Tech Embracing Ability of Accountants	Number of Respondents in Frequency and Percentage					Sum	Mean	Total
	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree			
S35: Plan, formulate and implement a sophisticated strategy specifically to address digitization and the intervention of AI into my company.	6 5.0%	12 10%	12 10%	52 43.3%	38 31.7%	464	3.87	120 100%
S36: Be flexible to move with the changes AI brings.	4 3.3%	11 9.2%	13 10.8%	42 35.0%	50 41.7%	483	4.03	120 100%
S37: Move out of my comfort zone and dwell in an innovative culture of change.	5 4.2%	9 7.5%	10 8.3%	46 38.3%	50 41.7%	487	4.06	120 100%
S38: Disrupt, redefine business strategy and establish an agile and experimental mindset in adopting AI.	7 5.8%	9 7.5%	15 12.5%	42 35.0%	47 39.2%	473	3.94	120 100%

Artificial Intelligence as a Paradoxical Digital Disruptor in the Accounting Profession.

S39: Make an effort to understand digitization and disruption led by AI.	1	5	14	49	51	504	4.20	120 100%
S40: Understand, learn and adopt AI urgently.	16	11	13	40	40	437	3.64	120 100%

Source: Primary Data

Exhibit 4.14: The 6 Tech-Embracing Ability of Accountants



Source: Primary Data

Artificial Intelligence as a Paradoxical Digital Disruptor in the Accounting Profession.

The Table 4.14 and Exhibit 4.14 illustrate frequency and percentage, and mean from the response of the respondents pertaining the extent of their agreement towards the 6 tech-embracing abilities of Accountants in embracing Artificial Intelligence (AI). Based on their agreement intensity, it will be revealed if the Accountants today are ready or not towards embracing, adopting and implementing AI.

There are 6 tech-embracing abilities, each with one statement, thus, a total of 6 statements (S35 to S40) are portrayed to test the extent to which the respondents are ready in embracing AI. If all the statements of tech-embracing abilities are highly agreed, then it shows the accountants are ready to embrace AI and that since they will embrace, they are likely to be positively impacted by AI, allowing AI to have a higher degree of positive and favorable, opportunity-creating influence on AP, rather than adverse, threat-igniting influence.

Strategic vision for implementing AI was tested with 1 statement. The mean derived was 3.87 for S35 which shows that respondents have agreed with 52 (43.3%) and 38 (31.7%) out of 120 respondents agreeing and strongly agreeing to have strategic vision. This shows, approximately 90 out of 120 respondents are ready to plan, formulate and implement a sophisticated strategy specifically to address digitization and the intervention of AI. There are only 18 (15%) out of 120 respondents who opted the disagreeing options, showing that in advent of IR4.0, there are lesser people resisting and more people interested to have the capability to embracing technology. Thus, it can be deduced that in a holistic view, accountants are to have a strategic vision implementing AI, thereby embracing AI and allowing AI to have higher degree of positive influence on AP.

Flexibility was tested with 1 statement. The mean derives was 4.03 for S36 which shows that respondents have agreed with 42 (35.0%) and 50 (41.7%) out of 120 respondents agreeing and strongly agreeing to have flexibility. This shows, approximately 92 out of 120 respondents are ready to be flexible to move with the changes AI brings.. There are only 15 (12.5%) out of 120 respondents who opted the disagreeing options, showing that in advent of IR4.0, there are lesser people resisting and more people interested to have the capability to embracing technology. Thus, it can be deduced that in a holistic view, accountants are to have flexibility to move with AI-driven disruptions, thereby embracing AI and allowing AI to have higher degree of positive influence on AP.

Culture of change was tested with 1 statement. The mean derived was 4.06 for S37 which shows that respondents have agreed with 46 (38.3%) and 50 (41.7%) out of 120 respondents agreeing and strongly agreeing to embrace culture of change. This shows, approximately 96 out of 120 respondents are ready to move out of their comfort zone and dwell in an innovative culture of change. There are only 14 (11.7%) out of 120 respondents who opted the disagreeing options, showing that in advent of IR4.0, there are lesser people resisting and more people interested to have the capability to embracing technology. Thus, it can be deduced that in a holistic view, accountants are to dwell into a culture of change driven by AI, thereby embracing AI and allowing AI to have higher degree of positive influence on AP.

Mindset-shift was tested with 1 statement. The mean derived was 3.94 for S38 which shows that respondents have agreed with 42 (35.0%) and 47 (39.0%) out of 120 respondents agreeing and strongly agreeing go through and accept a mindset-shift. This shows, approximately 89 out of 120 respondents are ready to disrupt, redefine business strategy and establish an agile and experimental mindset in adopting AI. There are only 16 (13.3%) out of 120 respondents who opted the disagreeing options, showing that in advent of IR4.0, there are lesser people resisting and more people interested to have the capability to embracing technology. Thus, it can be deduced that in a holistic view, accountants are to accept a mindset-shift from AI-driven disruptions, thereby embracing AI and allowing AI to have higher degree of positive influence on AP.

Understanding of AI was tested with 1 statement. The mean derived was 4.20 for S39 which shows that respondents have agreed with 49 (40.8%) and 51 (42.5%) out of 120 respondents agreeing and strongly agreeing to understand or make an effort to understand AI. This shows, approximately 100 out of 120 respondents are ready to make an effort to understand digitization and disruption led by AI. There are merely 6 (5.0%) out of 120 respondents who opted the disagreeing options, showing that in advent of IR4.0, there are lesser people resisting and more people interested to have the capability to embracing technology. Thus, it can be deduced that in a holistic view, accountants are to understand AI and AI-driven disruptions, thereby embracing AI and allowing AI to have higher degree of positive influence on AP.

Artificial Intelligence as a Paradoxical Digital Disruptor in the Accounting Profession.

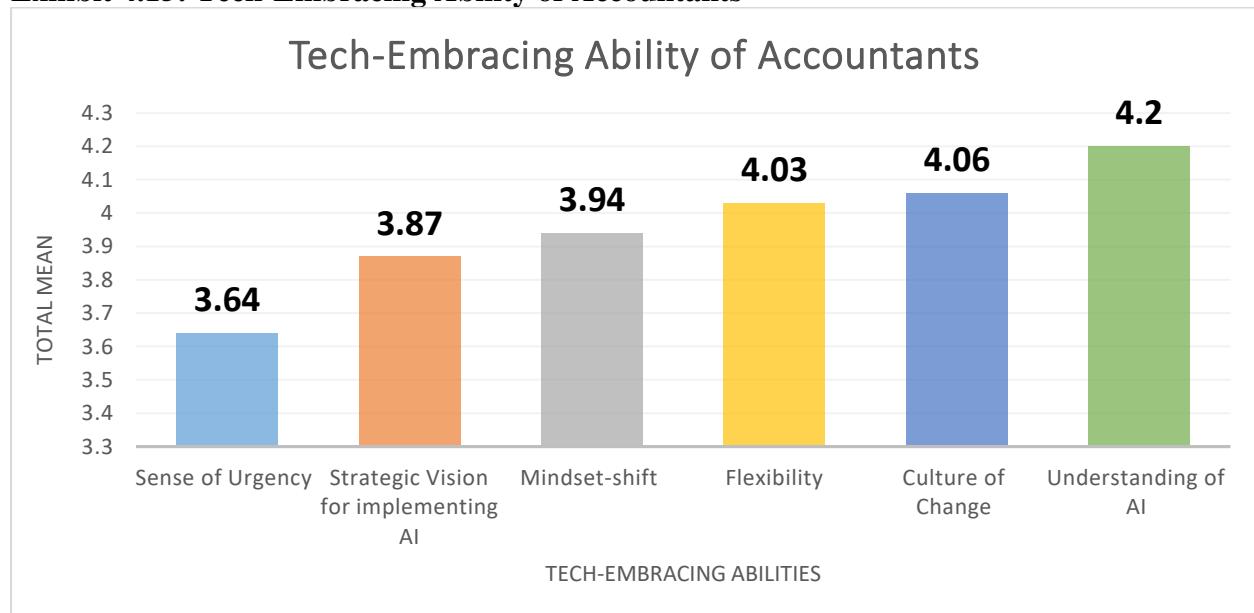
Sense of Urgency was tested with 1 statement. The mean derived was 3.64 for S40 which shows that respondents have agreed with 40 (33.3%) out of 120 respondents agreeing and strongly agreeing, respectively, to have sense of urgency in adopting AI. This shows, approximately 80 out of 120 respondents are ready to understand, learn and adopt AI urgently. However, there are 27 (22.5%) out of 120 respondents who opted the disagreeing options, showing disbelief that urgency is needed towards embracing change. Regardless, it can be deduced that in a holistic view, accountants are to uplift sense of urgency to move with AI-driven disruptions, thereby embracing AI and allowing AI to have higher degree of positive influence on AP.

Table 4.15: Tech-Embracing Ability of Accountants

Tech-Embracing Ability (TEA)	Total Mean
Strategic Vision for implementing AI	3.87
Flexibility	4.03
Culture of Change	4.06
Mindset-shift	3.94
Understanding of AI	4.20
Sense of Urgency	3.64
TOTAL MEAN TEA	3.96

Source: Primary Data

Exhibit 4.15: Tech-Embracing Ability of Accountants



Artificial Intelligence as a Paradoxical Digital Disruptor in the Accounting Profession.

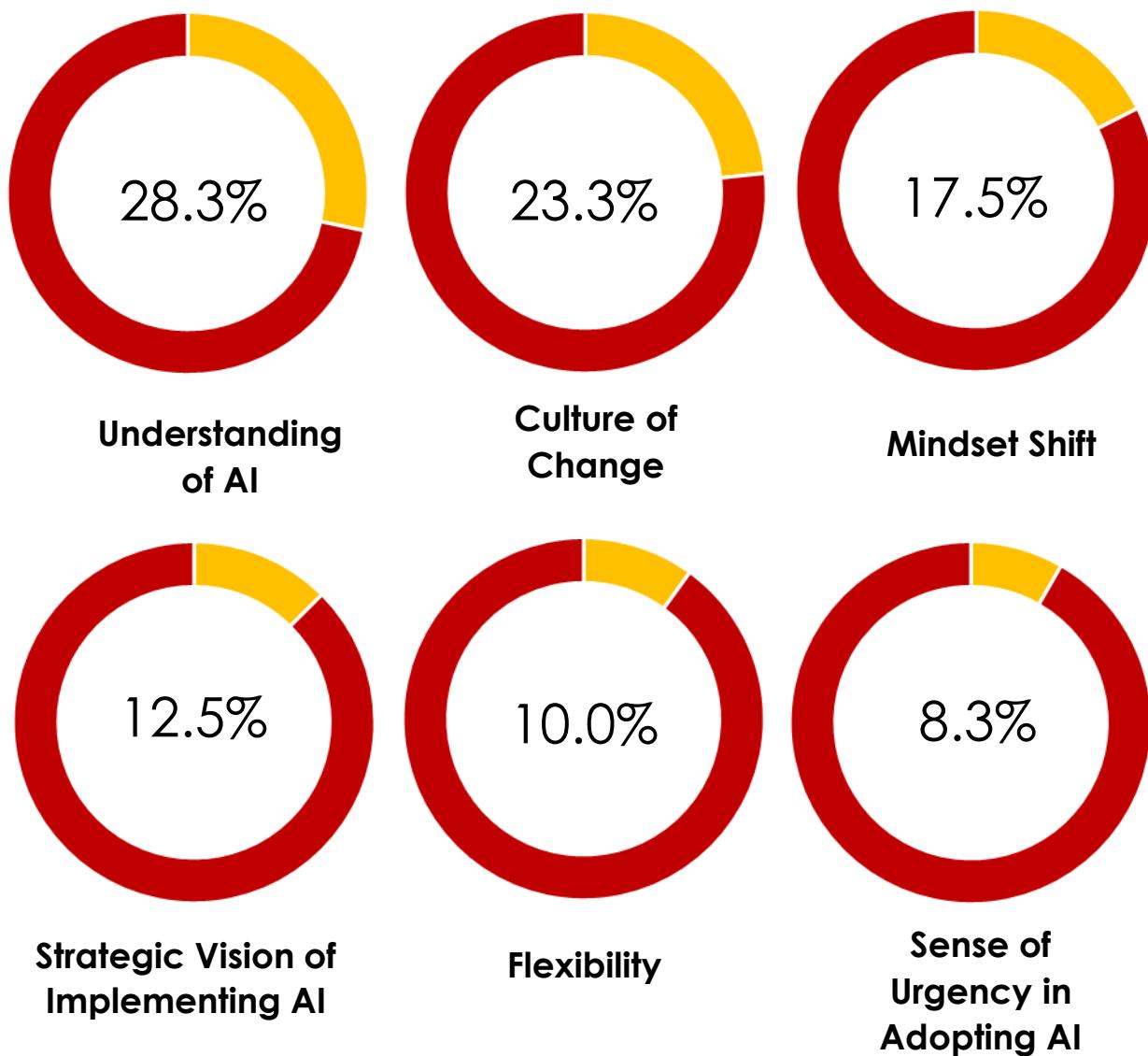
The Table 4.15 and exhibit 4.15 illustrate the total mean for each of the 6 tech-embracing abilities that shall reveal the significant level of influence of AI on AP. It can be deduced that AI is observed to have higher degree of positive influence on AP, because all the 6 abilities have been significantly agreed by the respondents who are accountants, but ‘understanding of AI’ has been most agreed with mean of 4.2 and the least through ‘sense of urgency’ with mean of 3.64. However, the disparity between the highest and the lowest mean is only 0.56, showing how all the tech-embracing abilities are agreed to be possessed by accountants and how they are on-track towards embracing digitalization and AI, and due to this, they are likely to enjoy a positive impact, thereby having AI to have a higher degree of positive and favorable, opportunity-creating influence on AP, rather than adverse, threat-igniting influence.

Since there is high intensity of positive level of influence of AI on AP, it means AP is going to be complement by AI (rather than being) replaced, there revealing that the continuity of AP to be sustained.

RANKING THE 6 TECH EMBRACING ABILITY OF ACCOUNTANTS

Which is the most important ability needed for successfully embracing AI as a digital technology?

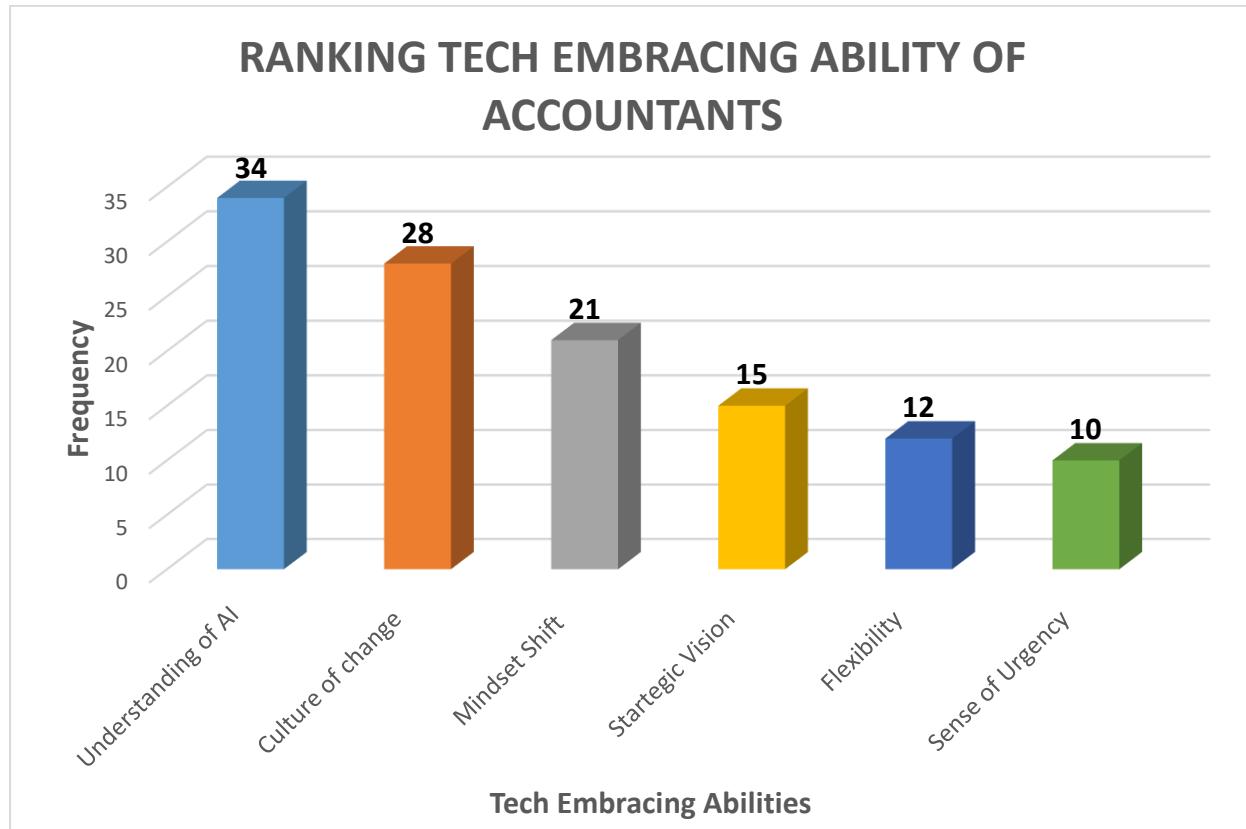
Exhibit 4.16: Tech-Embracing Abilities Ranked by Percentages



Source: Primary Data

Based on the abilities ranked according to percentages, the following diagram illustrates ranking based on frequency.

Exhibit 4.17: Tech-Embracing Abilities Ranked by Frequency



Source: Primary Data

The Exhibits 4.16 and 4.17 show the tech-embracing abilities ranking based on percentages and frequency. The 120 respondents who took part in the questionnaire survey were asked to rank the most important ability needed (out of the 6 tech-embracing ability) in the advent of IR 4.0, for embracing and adopting AI. The results show that “understanding of AI” is the most important ability needed with 28.3% that is 34 out of 120 respondents selecting it. This is followed by 28 (23.3%) and 21 (17.5%) respondents prioritizing on “culture of change” and “mindset shift” to be capabilities most needed by accountants whereas 15 (12.5%) and 12 (12.5%) respondents opting “strategic vision” and “flexibility” to be capabilities most needed in embracing AI. Surprisingly, “sense of urgency” is the capability least opted and given importance, with only 10 (8.3%) out of 120 respondents ranking it as most important capability.

Descriptive Statistics for Tech-Embracing Ability Variables

Table 4.18: Descriptive Statistics for Tech-Embracing Ability Variables

	Descriptive Statistics									
	N	Minimum	Maximum	Mean	Std. Deviation	Skewness		Kurtosis		
Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Std. Error	
DV_Evolving Role of Accountants in the Accounting Profession	120	2.25	5.00	3.9708	.65880	-.603	.221	-.125	.438	
Plan, formulate and implement a sophisticated strategy specifically to address digitization and the intervention of AI into my company.	120	1	5	3.87	1.122	-1.039	.221	.380	.438	
Be flexible to move with the changes AI brings.	120	1	5	4.03	1.096	-1.102	.221	.473	.438	
Move out of my comfort zone and dwell in an innovative culture of change.	120	1	5	4.06	1.087	-1.275	.221	1.044	.438	
Disrupt, redefine business strategy and establish an agile and experimental mindset in adopting AI.	120	1	5	3.94	1.162	-1.095	.221	.431	.438	
Make an effort to understand digitization and disruption led by AI.	120	1	5	4.20	.866	-1.112	.221	1.201	.438	
Understand, learn and adopt AI urgently.	120	1	5	3.64	1.377	-.802	.221	-.623	.438	
Valid N (listwise)	120									

Source: Primary Data

According to Creswell (2014), descriptive statistics produced by SPSS is the summary of the data collected in terms of its central tendency, variability and normality deviation pertaining all the variable distribution. An emphasis is given to skewness and kurtosis. Skewness is a descriptive statistic that measures distribution asymmetry whereas kurtosis measures the degree to which value distributes around the middle point. The normality values are typically accepted between -2 and +2, which are also accepted as favorable for the skewness and kurtosis measurements.

The Table 4.18 illustrates the descriptive statistics of the tech-embracing abilities. It can be observed that all the values of the 6 variables are favorable as the statistics of skewness and kurtosis are within the range of -2 to +2.

4.1.3.2 Reliability Test for Tech-Embracing Ability Variables

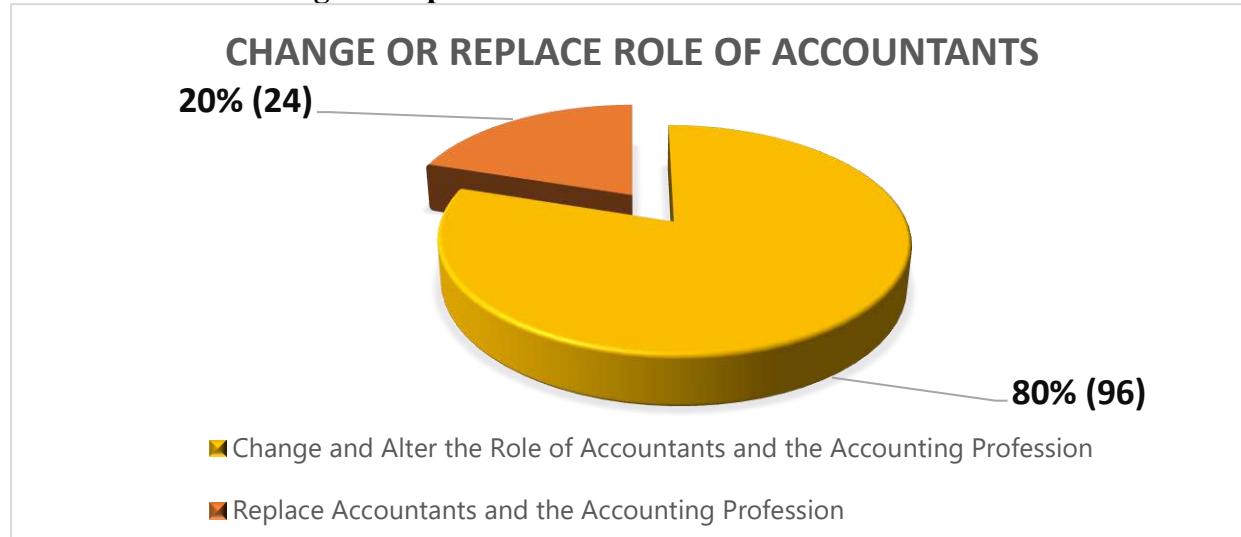
Table 4.19: Reliability Test for Tech-Embracing Ability Variables

Variables	Number of Items	Likert Scale	Cronbach's Alpha						
Dependent Variable – Evolving Role of Accountants in the Accounting Profession	4	1-5	0.863						
Tech Embracing Ability of Accountants									
-Strategic Vision for Implementing AI	1	1-5	0.842						
-Flexibility	1	1-5	0.850						
-Culture of Change	1	1-5	0.843						
-Mindset Shift	1	1-5	0.835						
-Understanding of AI	1	1-5	0.862						
-Sense of Urgency in Adopting AI	1	1-5	0.861						
Total Cronbach's Alpha:			0.819						
Overall Cronbach's Alpha			0.879						
Reliability Statistics <table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <th>Cronbach's Alpha</th> <th>Cronbach's Alpha Based on Standardized Items</th> <th>N of Items</th> </tr> <tr> <td>.879</td> <td>.862</td> <td>7</td> </tr> </table>				Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items	.879	.862	7
Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items							
.879	.862	7							

The Table 4.19 illustrates that the dependent variable has a Cronbach's Alpha of 0.863, followed by all the tech-embracing ability variables to be smaller than 0.90 and not less than 0.70, with total Cronbach's Alpha of 0.819. This shows that all the variable are within the Cronbach's Alpha required range and that adhere to the doctrine of Cronbach Alpha. The total Cronbach's Alpha derived is 0.874, which shows that all the variables are acceptable and reliable, with a significant continuous consistency.

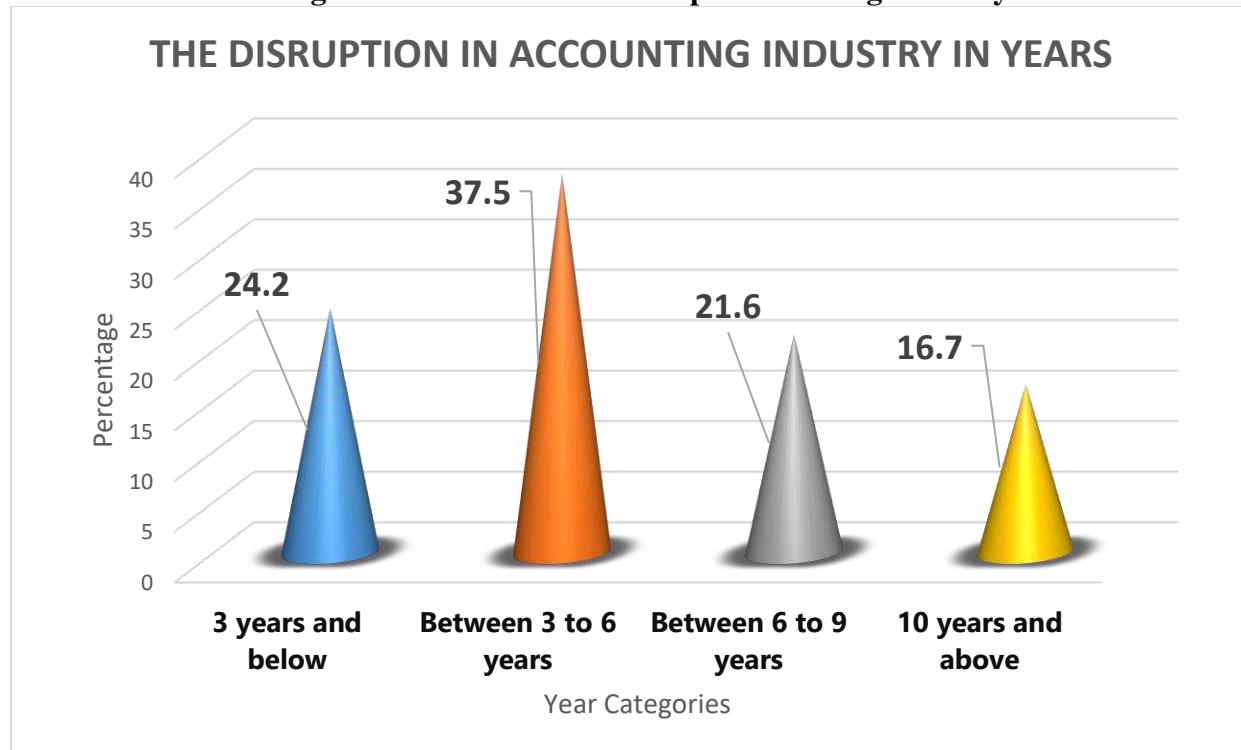
WILL AI CHANGE OR REPLACE THE ROLE OF ACCOUNTANTS?

Exhibit 4.20: AI Change or Replace AP?



HOW LONG WILL IT TAKE FOR AI TO DISRUPT THE ACCOUNTING INDUSTRY?

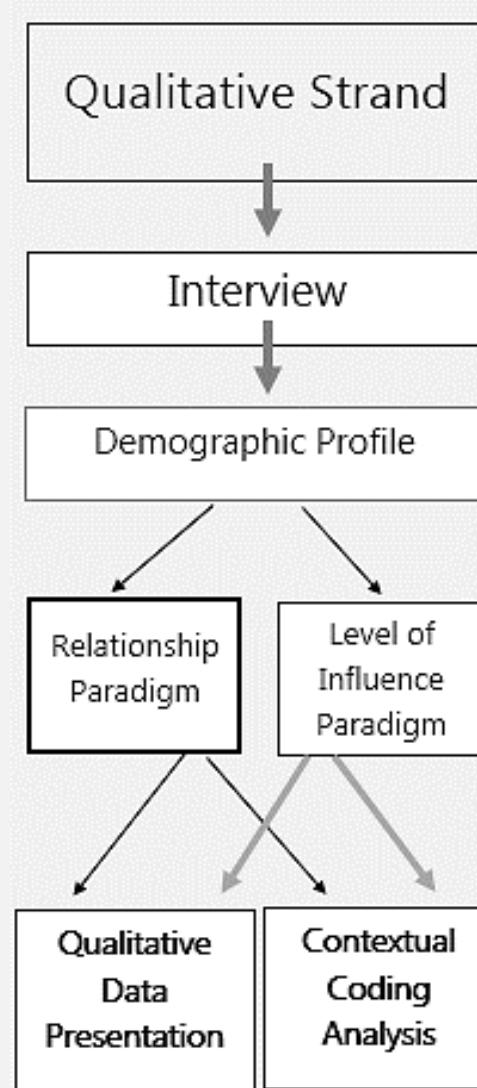
Exhibit 4.21: How long will it take for AI to Disrupt Accounting Industry?



Artificial Intelligence as a Paradoxical Digital Disruptor in the Accounting Profession.

The Table 4.20 illustrates that 80% that is 96 of 120 respondents belief that AI will change and alter to role of accountants and the AP whereas only 20% that is 24 of 120 respondents belief that AI will replace accountants and the AP. Based on these responses, the quest is still on regarding the disruption, where how long would it take for AI to disrupt the industry. The results, based on Table 4.21 shows that 37.5% that is a total of 45 respondents belief the disruption to vigorously occur “between 3 to 6 years”, followed by 24.2% (29 respondents) and 21.6% (26 respondents) belief it to occur “3 years and below” and “between 6 to 9 years”. However, only 16.7% that is 20 respondents think that it will happen “10 years and above”. Thus, it can be deduced that the disruption will likely occur in a range from 3 to 6 years.

QUALITATIVE STRAND



Artificial Intelligence as a Paradoxical Digital Disruptor in the Accounting Profession.

The qualitative strand is presented and analyzed based on the transcript information collected during the one-on-one semi-structured interview sessions that featured 9 Chartered Accountants. Since this research follows a fixed mixed method design which implies the quantitative and qualitative methods to be preplanned, the researcher selected 9 people from the 68-120 respondents who were to take part in the questionnaire survey. However, the 9 people were selected based on convenient sampling as only those who met certain demographic requirements in terms of age, years of working experience and academic qualification, were selected. This is because the researcher was ardent to maintain quality in the data collected from the interviewees.

A total of 8 questions were asked during the interview. The first 3 were directed towards investigating the “relationship paradigm” that aims to ascertain the positive and negative relationship between AI and AP, and the remaining 5 were directed towards investigating the “level of influence paradigm” that aims to ascertain the significant level of influence of AI on AP (whether is it more towards positive or negative), through discussing the doctrine of “tech-embracing ability” of Accountants, which eventually will reveal whether AI complements or replaces role of Accountants, and the continuity status of the AP.

The data collected from the interview responses is presented and analyzed by carrying out contextual coding analysis which is a qualitative data analysis method prescribed by mixed method and encouraged to be used for convergent mixed method studies. The following paragraphs present the qualitative data presentation and analysis distinctly.

4.2.1 Demographic Profile

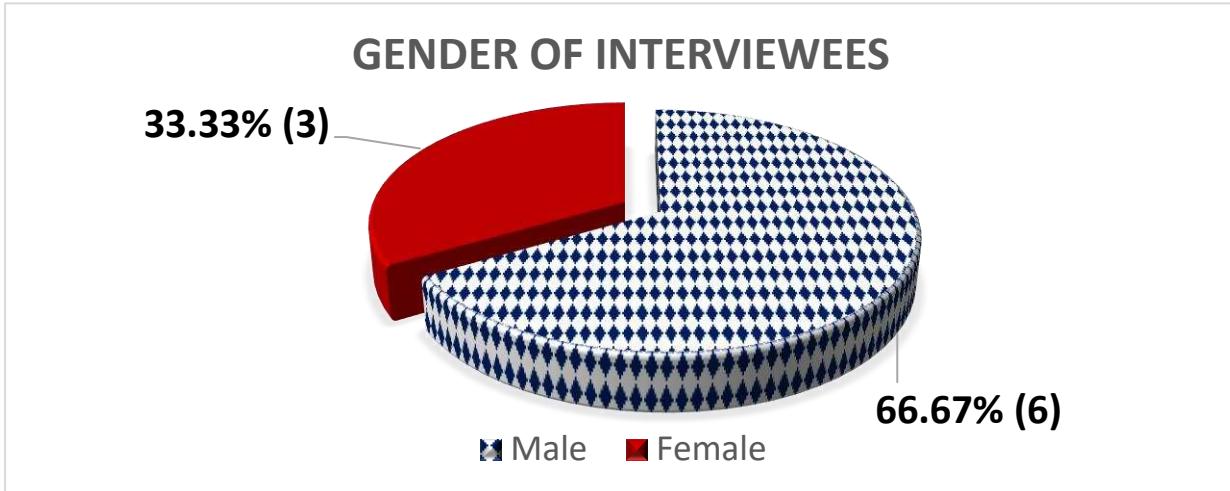
The section presents the demographic information of the interviewees. The information was provided by the interviewees upon request, hence the following tabulation.

Table 4.22: Demographic Profile of Intervieww Respondents

Name	Respondent Number Code	Gender	Highest Academic Qualification	Organization	Years of Working Experience	Code “R” for Respondent
Dr. Nurmazilah Dato’ Mahzan	R1	Female	PhD	MIA (Malaysian Institute of Accountants)	10 years and above	Chief Executive Officer
Mr. Yi Sheng	R2	Male	ACCA, FCCA	Ernst and Young (EY)	3 to 6 years	Senior Audit Associate
Ms. Meera Eeswaran	R3	Female	PhD	MIA (Malaysian Institute of Accountants)	6 to 9 years	MIA Young Professionals and Task Force for Tech Implementation Committee Member
Mr. Kok Wei	R4	Male	MICPA	Crowe Malaysia PLT	10 years and above	Executive Director/Partner – Audit and Assurance
Ms. Weiwen	R5	Female	ICAEW	Ernst and Young (EY)	3 to 6 years	ACA, Senior Audit Associate
Mr. Izzat	R6	Male	ICAEW	Klynveld Peat Marwick Goerdeler (KPMG)	3-6 years	ACA, Risk Advisory Services
Mr. Jason Zuryan	R7	Male	PhD	Deloitte Malaysia	10 years and above	ACA, Transaction Advisory Services
Mr. Anil Kumar Doshi	R8	Male	ACCA, FCCA	Ramakrishna & Associates Accounting Firm	10 years and above	Chartered Accountant and Senior Finance Consultant
Mr. Ram Manas	R9	Male	PhD	Grant Thornton	10 years and above	Executive Tax Advisory Services

Source: Primary Data

Exhibit 4.22: Gender of Interviewees



Source: Primary Data

The Table 4.22 and Exhibit 4.22 illustrate in frequency and percentage the gender of respondents who participated in the one-on-one semi-structured interview. The results show that 6 (66.67%) out of 9 respondents were male and the remaining 3 (33.33%) were female. Thus, it can be implied that the frequency of male is higher than females.

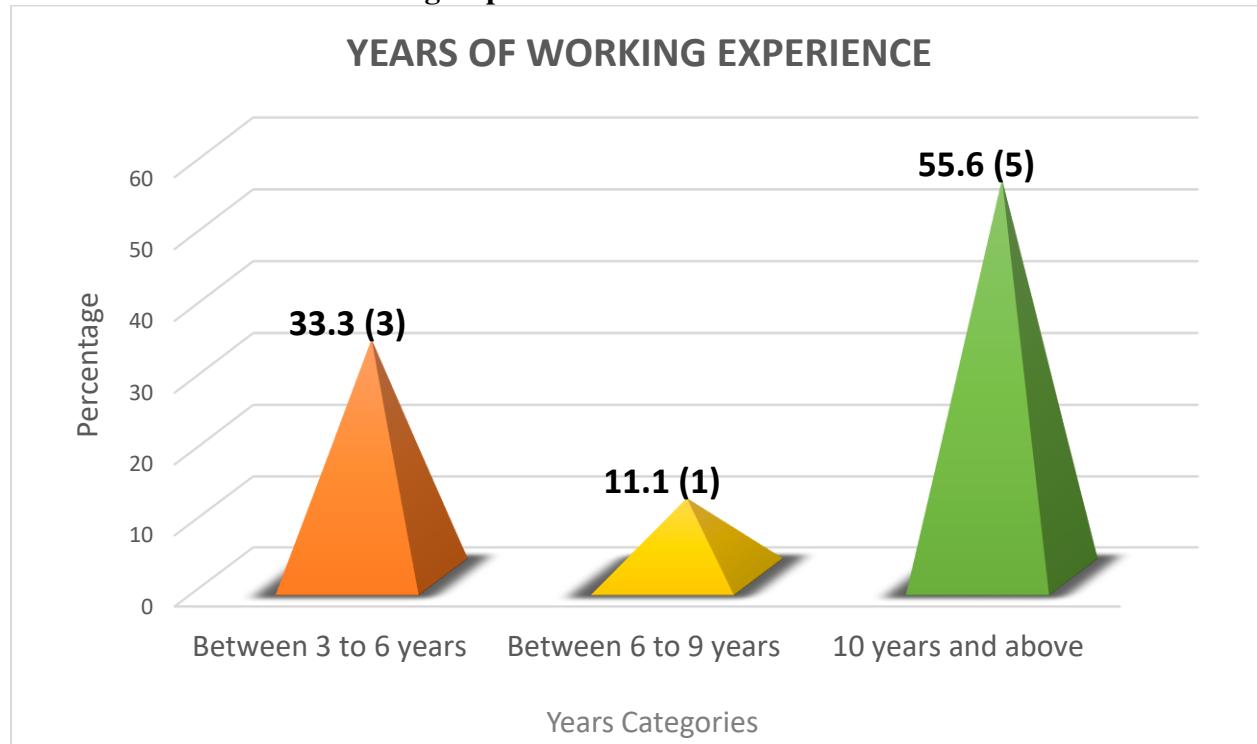
Exhibit 4.23: Highest Academic Qualification



Source: Primary Data

The Table 4.23 illustrate the frequency and percentage of interviewee's highest academic qualification. From the 9 respondents, 5 (55.6%) came from professional accountancy qualification like ICAEW, MICPA and ACCA, whereas the remaining 4 (44.40%) respondents are PhD holders. It shows the one-on-one semi-structured individual are highly qualified. 156

Exhibit 4.24: Years of Working Experience



The Table 4.24 illustrate the frequency and percentage of interviewee's years of working experience. From the 9 respondents, 5 (55.6%) came from 10 years and above work experience and 3 (44.40%) respondents have between 3 to 6 years of experience. There is only 1 (11.1%) of the 9 respondents that came from between 6 to 9 years of work experience. It shows that the one-on-one semi-structured interview has a good mixture of newcomers and experienced industrial individuals that shall give good stance to support the quantitative data of this mixed method study.

QUALITATIVE DATA PRESENTATION & ANALYSIS *for* RELATIONSHIP PARADIGM

4.2.2.1 Qualitative Data Presentation for Relationship Paradigm

The following information resemble the transcript information collected during the one-on-one semi-structured interview sessions that were carried out amongst 9 Chartered Accountants. A total of 8 questions were asked during the interview. The first 3 were directed towards investigating the positive and negative relationship between AI and AP (relationship paradigm). The responses for the first 3 questions are presented below.

Table 4.23: Interview Responses for Relationship Paradigm

Question 1	
Respondents	Responses
R1	<p>What is your view regarding the Accounting Profession's collaboration with technology?</p> <p>The Malaysian Institute of Accountants (MIA) have been taking innumerable initiatives in channeling technology into the AP. Thus, where the Profession is concerned, it has always been boosted to use technology in improving effectiveness and efficiency. However, most recently, in the advent of fourth industrial revolution, MIA officially released the MIA Digital Technology Blueprint 2018 which specifically features in preparing the Malaysian Accountancy Profession for the Digital World, by positioning technology as a strategic agenda. The blueprint talks about how technology is impacting the AP in different ways.</p> <p>The starting point, pertaining the collaboration of accounting and technology, begins with being clear regarding the technologies available around us as not all technologies are important for AP. But there are few technologies that emerge to be more important than the others. The first in rank is, Data Analytics and using AI for Analytics. Data Analytics is imperative for Accountants because Accountants handle huge volumes of financial data and some are non-financial data which relates to financial outcomes. These data need to be used, analyzed and interpreted for decision making. The ability to use analytics is core to the AP. However, with volume of data, sometimes it is very strenuous for AP to handle. This is where collaboration with AI is fostered for advantage.</p> <p>In the AP, technology becomes a Key Success Factor (KSF) and something that Accountants cannot do without, because Accountants work around businesses and organizations and there is very high correlation between AP and the economy as well as in social context. Also, if the AP's ecosystem is beginning to use a lot of technology, then definitely Accountants will be affected, and in one way or another are observed to have convergence with technology. This is how AI comes into the picture of AP and play a role in the work of Accountants, hence the collaboration. In Accounting, technology today is ABCDE – Artificial Intelligence, Blockchain, Cybersecurity, Data Analytics and Ethics. Ethics bring trust. It is the pinnacle of the AP.</p>

R2	The AP has always been observed to be embracers of technology . It can be seen from the instances where the development of accounting software such as Sage UBS and SQL are used to perform, for example financial accounting, preparation of statement of comprehensive income and statement of financial position. Thus, the Accountants and AP can be said to possess significant enthusiasm towards improving their efficiency and effectiveness through the use of technology. This is because they view technology as an enabler to elevate their performance in business, hence a very ancient bond of collaboration with technology. As with the fourth industrial revolution, the AP is also seen to keep up with the advancement in technology by implementing several AI-empowered software to automate their roles, so as to remain relevant and useful. So, as collaborators, they have very strong convergence with technology.
R3	Technology is something that has grown over the past years and the use of it is increasing in many other services. It is no longer just used for the purpose of IT development, but for many other services which can be enhanced with the use of technology. Accounting is one of them. This is mentioned in the article entitled ‘Disruption in Accounting and Finance – From Book-keeping to Strategizing ’ written by me (the respondent Ms. Meera) and published on Leaderonomics’ e-magazine in June 2019, where Accounting is purely an information system , and Accountants run the role of providing information to stakeholders. This information is very crucial and demand a thorough level of understanding for its accuracy. This is when technology steps in to improve accuracy of information. Specifically, referring to AI, it automates process and makes information readily available in quick manner. It takes away many redundant roles and coverts them into more strategic areas .
R4	The AP has always extended their expertise by leveraging technology in the work they do. This is because the AP plays a key role in ensuring the deliverance of information is relevant, reliable, understandable and comparable. Thus, technology becomes a tool in order to perform their respective functions. For instance, Accountants have and are still using software to record transactions, store data and information, transmit and report financial information. The only difference in the significance of their collaboration is that, now they will be using AI-empowered software in executing their Accounting work.
R5	The AP has shown commendable level of persistency and consistency in addressing the necessity of the profession to be equipped with technology . In this age, the collaboration is visible, in terms of how Accountants are using system to record day to day operations of a company, ie post double entries, track payment process and inventory records. This is because Accountants are interested to ascertain how the system works and how much cost benefit/ efficiency it will bring compared to manual recording .
R6	AP has been evolving simultaneously with the technology. Modern technology forces the AP to be adaptive as there are more complex transactions and processes involved. This also carries new risks and threats to the financial data and to the business itself. Therefore, the technology itself is put at use in the AP to develop efficiency and effectiveness in accounting. It might not be that economical during development phase as technology requires significant investment . However in the long run, it will be much more cost effective . This collaboration helps finance professionals save time, effort and minimize error in accounting. This has been

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	proven in the industry for years. As the time passed by, technology will continue to evolve so does AP.
R7	The AP is an abode of professional individuals who never failed to radically improve with the changes in the ecosystem. The accounting systems in place is an evidence of how AP executed work efficiently. Thus, their collaboration can be given a golden 5 star rating as AP has brought itself at a position where it technology is something AP cannot do without. This is because AP has always used technology as a leverage for excelling at their work. It is not because AP cannot perform their work without technology, but because of the ecosystem demand that if AP omits to use technology, they are likely to work harder when the work can be done with an easy method. The collaboration can be implied as an art of living and being professional in the industry.
R8	Technology has become a phenomenon that is changing the environment today. The potency of technology today appears to be very distinct if compared to the technology 2 decades ago. This is why this period of the era is heavily associated with digitalization. Back then, accountants used technology, but basic technology to have their work complemented and have the results of their work delivered at a professional quality . However, today is not about accountants using technology for professional development , but technology like AI using accountants for digital development that will help accountants in their work. This is an environment, not only inevitable , but needing greater collaborative approaches with technology, in order to survive in the profession and stay relevant . Thus, the collaboration can be articulated to gain more significance in the advent of IR4.0 than 2 to 3 decades ago.
R9	The technology of IR4.0 is built to collaborate with accountants. If accountants omit to showcase a collaborative attitude towards technology, then technology would appear to overpower their capabilities. Collaboration is an indispensable mechanism for profession like AP that shelters integrity, accountability and trust . This is because technology is something that can enhance these elements and allow the AP to escalate in terms of the different services they can provide with the same elements staying steadfast in duty. The AP is observed to collaborate with technology mostly through the efforts of regulatory like MIA that is taking innumerable initiatives in bridging the gap between understanding of AI and the potential opportunities that AI can provide. Collaboration with technology is the epitome in striving for excellence because its puts the accountant's minds into a quest for knowledge . This is how talents are nurtured in the industry.

Question 2

How would you describe disruption in Accounting Profession?

Respondents	Responses
R1	<p>Digital Disruption is a megatrend affecting the AP. But disruption possess poses both risks and opportunities. The MIA has put in place key initiatives to prepare members and all AP in ecosystem to leverage on these unfolding prospects and mitigate risks. Talking about disruption, AI is to augment Accountants, not to replace. The disruption in AP can be explained according to the report issued by Asia Development Bank (ADB) on 'How Technology affects Job'. ADB explains it through 4 quadrants.</p> <p>Quadrant 1 - mundane and cognitive. Example: bookkeeping which is boring and need use of mind. This job is likely to be replaced. In fact, it is already being replaced. Quadrant 2 - mundane but not cognitive, rather vocational. Example: brick laying. Repetitive but no need use thinking. This is also likely being replace by AI. In fact, it is already being replaced. Quadrant 3 – cognitive but specialized. Example: CEO who does a lot of decision making and also the Financial Planning and Analysis team that use a lot of data for predictions. These jobs need skills and brain power for decision making – which is less likely to be replaced. Quadrant 4 - not cognitive and not repetitive. Example: Fashion designing and hairdressing which are not cognitive but special and customized. These are not easy for AI to replace. It will take years.</p> <p>Therefore, disruption in AP describes how Accountants need to aim for niche, to not fall in the quadrants that are likely to be replaced. Based on several recent round table conversations, the banking sector is demanding people who are good in Accountancy and Coding. Although you may not be the main coder, but if you understand how coding works, then you can work with the programmer. These are the demands that emerge with disruption. So, for the disruption, the most important is for the AP to move from one zone to another and it is taking a lot of time for Malaysia, and it will take a lot of time, but again, better late than never.</p>
R2	<p>Disruption is the gist of transformation – which always happens when there is evolution. In this age, it is the digital evolution, and so the driven digital disruption. In broad sense, disruption is anything that interrupt or rather interfere in the status quo of the AP. However, it is imperative to be aware that, disruption brings opportunities with risks. It is not a phenomenon with a single impact, but dual impact. In Accounting, we call it duo – which is rather a matter of cheer and fear, together.</p>
R3	<p>The term disruption does implicate something negative at a first look, but upon pondering towards its true nature, it is something that is very much needed in the world today, and specifically in the AP. This is because without disruption, the AP will not be utilizing the change and move with time, and eventually not step into the evolution. The act of standing still is what makes disruption to be a threatening agent, but taking a step forward towards the change would push you at an advantage. In Accounting, disruption is an enabler and a destructer, but definitely more of an enabler because the AP is interested to use technology in providing sophisticated solutions for business issues. The idea is, as long as one understands</p>

	the use and benefits of technology, then technology shall not cause anything negative towards the profession.
R4	Disruption is closely associated with the power of technology to cater transformation , be it complementing or even replacing the work of Accountants. Majorly, the transformation will demand for drastic changes because without change, there is no chance to leave the old and tap the new.
R5	Digital disruption is the change that occurs when new digital technologies and business models affect the value proposition of existing goods and services.
R6	As the technology being incorporated in the AP, there will be a disruption to the profession itself. This is due to the elimination of administrative work that could be done through an automated system. Take a cashier counter for example. In the past, we need someone to be at the cashier for the sale and purchase to happen. Now, there is a self-service kiosk which no longer require a manpower for such tasks. This eventually minimize the job opportunity for a cashier position. The disruption normally affects non-decision making roles where it could be done by a system with minimal supervision.
R7	Disruption is inevitable . It makes transformation its forte . In the advent of IR4.0, technology is the biggest disruptor, especially in the context of AI and the AP. It is a two way road , where disruption is to appear at an unstoppable pace , and the same is demanded from accountants when it comes to dealing with disruption. It is only then, at this very point of interface that AP can disrupt before getting disrupted . From this theory, it is evident how the role of AP is important to address disruption in order for disruption to work at AP's benefit , if not disruption shall disrupt the industry which will be arduous for accountants especially when the AP is not prepared for such a transformation. Thus, it can be said disruption brings positive chances that should not be missed, but if they are missed, then disruption feels unfavorable .
R8	The ideology of disruption literally disrupts the psychological flow of thoughts. This is the power of disruption which is built on fostering change to be constant and uncertainty to be certain. This phenomenon is not something that suits every accountant's psychology , hence the attitude to resist embracing change. However, the resistance is not a prolonging problem , because every accountant would want to avoid the consequences of not embracing change. Thus, it can be said disruption threatens but serves a platter of opportunities at the same instance. The psychology easily gets interrupted with risks, and it takes time till one realizes the true nature of disruption that brings transformational opportunity . However, time is something imperative for one to change , but disruption is something that requires quick embracement and no hesitation if not its impact could be unfavorable . This is the setting when AI acts as disruptor today, it wears the mask of disruption, just right, thereby emitting the same impact on accountants – opportunities and risk.
R9	The AP today is disrupted with technology . It is common for accountants to perceive disruption as a negative aspect as it is something that goes against the comfort zone . However, it is important to understand the underlying tone of disruption. In tech-sense, disruption is the environment that comes with evolution . When we refer to evolution , it is the change from one dimension to the other. To bring this change into reality is the duty of disruption . However, change is not only negative, because where tech-disruption is concerned, it is the venture of

	<p>technology solely to aid people, especially the accountants, without which it is difficult to survive in an ecosystem that uses tremendous amount of technology. It appears to be negative because change is often resisted than embraced. It is the resisting attitude that makes disruption a risky phenomenon. Thus, it can be articulated that disruption in AP is the tech-driven disruption, which offers a chance to embrace to take advantage of its aiding quality, but failure to this makes disruption nothing but risk. It is a phenomenon of dual personality.</p>
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Question 3

What is your view on the opportunities created and threats ignited by AI? Should Accountants embrace it or fear from it?

Respondents	Responses
R1	<p>Looking at the threats, there are more opportunities, because we are looking at areas in accounting that can be made more effective with the use of AI. For example, the Islamic Finance industry is demanding for individuals who are good at Accounting knowledge, Islamic Finance Principle and Finance. At the moment, there is none with abilities in all the three areas. Thus AI, like the IBM Watson is likely to come in where it will be trained for the area that the individuals are not so good at and then work with individuals who have the knowledge. This is when the scope of opportunities is wide with AI.</p> <p>Another example is the case in Auditing, where stock take for Oil Palm Plantation is done using drones. Thus, usage of drones have become a problem solver for the limitations of human. In this itself, more jobs are created. It is the evolution of jobs. Jobs that are changing and at the same time, during this change, some are being replaced and new ones are created. It is a cycle of evolution. This is not new and this is not threat. The only threat is when you want to stand still. Thus, psychologically, instead of fearing, Accountants should accept the change and embrace it.</p>
R2	<p>AI opened up a whole range of possibilities, it is unimaginable what AI could do in the future, AI would be of a great help in any area of life. The threats created by AI should not be avoided, it is as if we are avoiding our problems. We are to face our problems and take on challenges in order to have a better version of ourselves. Accountants should do both, fear it and then embrace it. Yes, we should fear it as AI would definitely take over if we do not constantly keep up with technology and work hard to improve along with it. With that, we take up the challenge to embrace it, not embracing it would be as if accountants are still trying to use pen and paper instead of an excel sheet to perform their work.</p>

R3	Accountants today should not fear, because fear will not get them anywhere, rather leave laidback . Thus, the option is towards embracing it. However, there is a dilemma pertaining how to embrace technology , in the sense that, how to ensure we use it in most cost efficient manner and at maximum capacity . This is the point Accountants must convert technology as an opportunity and look at it in a strategic vision for building it as an organization wide strategy, to further the business, to create more strategic roles for Accountants, catering a better work life balance and most importantly to grow the profession into providing more services.
R4	Opportunities should pull Accountants towards the embracing paradigm , and threats should not be observed as obstacles , but should be accepted as a set of unfavorable uncertainties that are bound to happen. With acceptance, new solutions can be articulated to reduce the threats. But it should all begin with embracement . Therefore, Accountants should embrace all new technology, be it in the form or AI or others. The profession should understand the changes brought about by AI and harness and use this to enhance their work, making the profession more efficient and effective in their work.
R5	One of the opportunities created by AI is that it creates different job opportunities that require a higher skillset while replacing the lower skilled jobs . It gives us a chance to develop ourselves through continuous learning in order to avoid being replaced . Whereas the threats to this is data corruption and leaking of confidential information as well as the accountability and trust that is at stake . However this can be mitigated with proper procedures in place. So, against this backdrop, it is clear how accountants should just take a step forward towards digitization, through the action of embracement . Once these happens, the fears will automatically get a chance to be introspected upon and eventually resolved.
R6	AI is a highly advance technology that could simulate human intelligence . Opportunities derived from it are the solutions to the problems in human's daily life that lead to the creation of AI. It will definitely ignite threats due to its sophisticated function . It is important to first understand the technology itself so that any mitigation action could be put in place. As accountant, we should not be fear of a technology. Embrace it, utilize it , and together, it could make wonders.
R7	Opportunities should be grabbed , threats should be contemplated . The art of grabbing needs embracement but the art of contemplating needs threats . The dual personalities of disruption is very important, as without one, it will not be able to emphasize another. This means, for example, it is the threats that motivate one to look into opportunities , because it is only through opportunities that one will be able to combat threats . This is how a professional must think. So, accountants should use opportunities and threats interchangeably to convert their fear into embracement . In the end of the disruption cycle, only those who embraced technology and realized the true transformational opportunity of AI is to survive . The rest shall be seen suffering .

R8	<p>The phenomenon of disruption proves the opportunities and threats of AI. It is important to understand that digital technology engenders opportunities for those professionals that are prepared to embrace them and adapt to changes. The embracement is a process of praising technology when it makes the work of an accountant not only easier, but of better quality in terms of execution and deliverance. This makes technology a boon for accountants. However, since accountants are human, it would not be right to say not to fear. This is because, there is no bravery without fear and no fear without bravery. In fact, fear itself has a dual personality. Fear is something that tells you to stop doing something and start doing the other. If critically evaluated, fear is more necessary than embracement, because it is fear that shall escort accountants to stop resisting and start embracing AI.</p>
R9	<p>The world hears accountants to lose jobs, but the world also hears accountants to be one group of people that does not have any issues when it comes to job security. There are many technological revolutions over the past few decades that have come and gone, but accountants are seen to progress continuously without their continuity being halted. Thus, in the advent of disruption being an alarming phenomenon, there is nothing but just a ‘yes’ needed for having technologies change the way accountants work. It may sound peculiar if one looks over the transformation effects over short-term, but more and more sensible when pondered over the long-term benefits. The art of embracement should be perceived like a fringe benefit because there is an agent available to make the work of an accountant easier, interesting and in-depth. Within this frame of minds, there is not space for fear.</p>

4.2.2.2 Contextual Coding Analysis for Relationship Paradigm

Based on the responses for the first 3 questions presented above, the following information is the contextual coding analysis performed through extracting the most important pointers, grouping them and labelling them with preliminary codes and then regrouping them into broader codes known as themes, so that they reflect increasingly broader perspectives. In short, it is the process of filtering the complex data collected from the original interview responses, so as to merge with quantitative data results, to perform further data analysis and interpretation.

Table 4.23: Contextual Coding Analysis for Relationship Paradigm

Respondents	Preliminary Codes	Final Codes (Themes)
Question 1: What is your view regarding the Accounting Profession's collaboration with technology?		
R1	<ul style="list-style-type: none"> • Innumerable initiatives • Technology Blueprint • Technology strategic agenda • Technology clarity • Data Analytics • AI for Analytics • ABCDE 	<ul style="list-style-type: none"> • Key Success Factor
R2	<ul style="list-style-type: none"> • Embracers of technology • Accounting software • Enabler • Ancient bond • Strong convergence 	<ul style="list-style-type: none"> • Ancient Convergence
R3	<ul style="list-style-type: none"> • Industry-wide disruption • Information system • Crucial Information • Improving accuracy • Strategic areas 	<ul style="list-style-type: none"> • Book-keeping to Strategizing
R4	<ul style="list-style-type: none"> • Leverage technology • Information deliverance • Software tool 	<ul style="list-style-type: none"> • Shift from basic to AI-empowered Software

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R5	<ul style="list-style-type: none"> • Tech-persistency • Tech-consistency • System for recording • Cost/benefit efficiency • Manual recording 	<ul style="list-style-type: none"> • Tech-necessity
R6	<ul style="list-style-type: none"> • Adaptive • Complex transactions • Financial data risk and threats • Significant investment • Cost effective 	<ul style="list-style-type: none"> • Simultaneous Evolution
R7	<ul style="list-style-type: none"> • Abode of professionals • 5 star rating • Unaffordable not to collaborate • Ecosystem demand • Art of living 	<ul style="list-style-type: none"> • Art of Professionals
R8	<ul style="list-style-type: none"> • Distinct collaboration • Greater initiatives • Significant collaboration • Necessity 	<ul style="list-style-type: none"> • Significant Collaboration
R9	<ul style="list-style-type: none"> • Indispensable mechanism • Integrity • Accountability • Trust • Steadfast in duty • Striving for excellence • Young minds in their quest 	<ul style="list-style-type: none"> • Epitome of excellence

Respondents	Preliminary Codes	Final Codes (Themes)
Question 2: How would you describe disruption in Accounting Profession?		
R1	<ul style="list-style-type: none"> • Megatrend • Risks and opportunities • Augment not to replace • 4 quadrants of mundane and cognitive 	<ul style="list-style-type: none"> • Risk and Opportunity • Complement and Replace
R2	<ul style="list-style-type: none"> • Gist of transformation • Consequence of evolution • Interrupting status-quo • dual personality 	<ul style="list-style-type: none"> • Dual Impact • Risk and Opportunity
R3	<ul style="list-style-type: none"> • Negative but needed • Move with time • Not standing still • Risks and opportunities 	<ul style="list-style-type: none"> • Threatening but advantage agent • Enabler and destructor
R4	<ul style="list-style-type: none"> • Gist of transformation • Changing ecosystem 	<ul style="list-style-type: none"> • Dual Impact • Complement and Replace
R5	<ul style="list-style-type: none"> • Gist of transformation • Changing ecosystem • Affecting value proposition 	<ul style="list-style-type: none"> • Dual Impact • Complement and Replace
R6	<ul style="list-style-type: none"> • Elimination of job • Complement for decision-making 	<ul style="list-style-type: none"> • Dual Impact • Complement and Replace
R7	<ul style="list-style-type: none"> • Transformation forte • Unstoppable pace • Disrupt or get disrupted 	<ul style="list-style-type: none"> • Dual Impact • Complement and Replace
R8	<ul style="list-style-type: none"> • Psychology suiting • Not prolonging problem • Avoid resisting change consequences • Risk • Transformational opportunity • Embrace without hesitation 	<ul style="list-style-type: none"> • Dual Impact • Complement and Replace

R9	<ul style="list-style-type: none"> • Interrupt comfort zone • Aid humans • Chance to embrace • Embrace failure creates risk 	<ul style="list-style-type: none"> • Dual Impact • Complement and Replace
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Respondents	Preliminary Codes	Final Codes (Themes)
Question 3: What is your view on the opportunities created and threats ignited by AI? Should Accountants embrace it or fear from it?		
R1	<ul style="list-style-type: none"> • More opportunity than threats 	<ul style="list-style-type: none"> • Do Not Fear • Embrace
R2	<ul style="list-style-type: none"> • New range of possibilities • Not to avoid threats • Keep up with Technology 	<ul style="list-style-type: none"> • Fear as Motivation • Embrace
R3	<ul style="list-style-type: none"> • Threats lead laidback • Dilemma to embrace correctly • Organization-wide strategy • Work-life balance 	<ul style="list-style-type: none"> • Do Not Fear • Embrace Correctly
R4	<ul style="list-style-type: none"> • Opportunities to ignite embracement • Threats are not obstacles • Uncertainty acceptance 	<ul style="list-style-type: none"> • Do Not Fear • Uncertainty acceptance
R5	<ul style="list-style-type: none"> • Development opportunity • Accountability and Trust threats • Embrace removes fears 	<ul style="list-style-type: none"> • Fear introspection • Embrace through threat mitigation
R6	<ul style="list-style-type: none"> • Opportunities are solutions • Sophisticated function is threat • Understanding remove fear • Without fear, embracement happens 	<ul style="list-style-type: none"> • Do Not Fear • Embrace by understanding
R7	<ul style="list-style-type: none"> • Grab and embracement • Contemplation and threat • Threat as opportunity • Fear as medium for embracement 	<ul style="list-style-type: none"> • Fear and then embrace • Embrace

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R8	<ul style="list-style-type: none">• Without embracement, opportunities lost• Fear is good• Stop doing and start doing concept• Resist and then embrace	<ul style="list-style-type: none">• Fear leads to embracement• Embrace
R9	<ul style="list-style-type: none">• Short-term peculiar• Long-term sensible• Fringe benefits• Agreement and acceptance of change• No space for fear	<ul style="list-style-type: none">• Do Not Fear• Embrace

**QUALITATIVE DATA
PRESENTATION & ANALYSIS**

for

**LEVEL OF INFLUENCE
PARADIGM**

4.2.3.1 Qualitative Data Presentation for Level of Influence Paradigm

The following information resemble the transcript information collected during the one-on-one semi-structured interview sessions that were carried out amongst 9 Chartered Accountants. A total of 8 questions were asked during the interview. The remaining 5 were directed towards ascertaining the significant level of influence of AI on AP (whether it more towards positive or negative), through discussing the doctrine of “tech-embracing ability” of Accountants, which eventually will reveal whether AI complements or replaces role of Accountants, and the continuity status of the AP (level of influence paradigm). The responses for the remaining 5 are presented below.

Table 22.5: Qualitative Data Presentation for Level of Influence Paradigm

Respondents	Responses
R1	<p>The level of positive or negative influence of AI on Accounting Profession is likely to be decided based on the ‘tech-embracing ability’ of Accountants. (This means, if they embrace it, they are likely to enjoy a positive impact, and if not, vice versa). How importantly do you view this?</p> <p>‘Tech-embracing ability’ of accountants is indispensable. It is the key attribute needed today. They have to be agile, open-mindset, willing to change and embrace change management because the economy and businesses are changing and embracing – even if people say not many businesses are changing, the question is how long are you going to survive? Can you afford not to follow this trend? If you can survive and afford it, then take on the risk of not transforming, and withstand it. However, even with this, many business are having problems as they may be waiting, but the moment wave of change comes, they are not be able to keep up with it. Thus, it is essential for Accountants to embrace AI to be augmented at work, rather than fearing and being laid-back.</p>
R2	<p>The embracing ability of accountants towards technology is the only way the Accountants and the AP will move with digital evolution. The embracing element is the most appropriate and relevant response towards digitalization. It would open up possibilities that Accountants will not be able to imagine until they tap the embracing button. Thus, it is uttermost imperative, if not Accountants are to be left on sidelines, while the world benefits from collaborating with technology.</p>
R3	<p>The key element in the AP’s ecosystem is ‘timing’. Currently, the AP faces a lot of positive embracement, especially from the Big4 who are ardently working in the idea of how to uplift the entire role of the profession using technology. This initiatives are bringing awareness to Accountants, as they want to reach out to</p>

	profession-wide. Thus, at this moment, AP is at the ‘ awareness stage ’, but it is occurring gradually, because the AP is being impacted by the negative-side of technology at the very same time, and they have to convert the negative influence into positive to ensure it does not get stronger (it should not), because if it does, then AP will fall back and be at disadvantage. This would give opportunities to other professions to take on roles of Accountants, since they have managed to get hold of the positive impact of technology. This is when the tech embracing ability of Accountants is imperative and crucial for the advancement of the profession.
R4	This is key to the advancement of the profession. AI will have a significant influence in not just the AP but possibly all other professions and industries . The more open we are to AI, the better we are at being able to use AI as a tool to enhance our work .
R5	This is indispensable . It is important as we need to adapt to this fast changing environment, to avoid being replaced/eliminated, eg Nokia. It is only this ability that will direct them to opportunities and give a chance for the threats to be defended . This is why, technology should always be viewed as an enabler and not a destructor . This way positive impact can venture into the profession.
R6	Embracing AI is the epitome for AP to move with evolution . Indeed, it is important for accountants to embrace the technology so that they could take advantage on it. Lack of knowledge and understanding will lead to fear and negative thoughts towards the technology.
R7	Tech-Embracing Ability (TEA) is the only relevant tool at the moment as we investigate the emerging technologies and their IR4.0 impact. This is because, embracement comes with values and virtues that are governed by effective principles that can instil a new habit in accountants today. It is something that accountants cannot embrace AI without. This makes it not only indispensable but a necessity . It is import to adopt TEA than to adopt AI. It is the TEA that will escort an accountant towards implementing and adjusting with AI.
R8	TEA can be addressed to be the most accurate measure because the disruptive force of AI appears to be uncertainty. When uncertainty is certain and change is constant, the effect of the circumstances falls in the hands of the person who is to be affected. In this case, accountants play an imperative role in deciding whether they want to be affected by AI positively or negatively. Introspecting on the opportunities and threats posed by AI, the accountant must be ratioc to recognize the TEA to be tools available for them to craft a better collaboration and continuity with AI. It is an option to gain competitive edge . When accountants are in a dilemma pertaining how to embrace AI correctly , the TEA is the only set of guiding abilities that can lead accountants towards not only embracement but a successful embracement.
R9	It is difficult to move in the journey of embracing AI without TEA. It is important because it channels the right thinking pertaining the disruptive environment. There are many businesses that are slow in tapping the transformational opportunity of AI. The growth towards embracement, especially in Malaysia, is very slow . That is why, preparing the Malaysian accountancy profession for the digital world is not a short term process . With TEA, the accountants are sure to experience a favorable impact from AI.

Question 5

How would you encourage Accountants to embrace AI? What is your advice or suggestions to the Accountants today?

Respondents	Responses
R1	<p>They have to be agile, open-mindset, willing to change and embrace change management. Accountants must not undermine the power or technology. Malaysia may be slow, but the disruption is already there, so there is no reason to wait. AI is the technology that augments human capabilities. In Accounting and Finance, there is the AI-empowered RoboCFO, where financial statements are uploaded and the AI will do the ratio analysis and provide narrative on the balance sheet position and financial performance. So, since RoboCFO does this work, then accountants will do the advisory and provide more qualitative suggestions in a faster manner to clients. In specific, AI is allowing the Accountants do more than they have done before with the help of AI, because work is detailed and consequently higher assurance. Example, in audit, sampling is not needed, every item can be tested hundred percent, with complete accuracy. To embrace AI, Accountants can begin working on the following 5 principles, namely - assess digital technology trends; identify capabilities; harness digital technology; funding and governance.</p>
R2	<p>Accounting managers will have to begin having strategic vision and undertake a digital strategy to implement AI in their firm – whereas the Accountants in professional firms and corporate organization will have to perceive their fear towards changes as a motivation towards embracing the change implemented by the company.</p>
R3	<p>The regulators play a key role, for example MIA which have been bridging the gap caused by the growing disconnection between technology adoption and the magnitude of understanding the transformational opportunities that it potentially provides. Thus, MIA has produced the Digital Technology Blueprint to help Accountants and the AP to ‘move’ with the digital evolution. Subsequently, to encourage Accountants towards embracing AI, it begins with the top management in creating the awareness and understanding. It should be a top-down approach, and the similar aspect should be seen in the bottom-up where they should be ready to follow the change implemented by strong acceptance. This refers to SMEs who make up large percentage of our economy and revenue, and with their acceptance itself, it could take the AP far with technology.</p>
R4	<p>It begins with the initiative to understand. With understanding, there will be an urge to step into the learning world. And it is only through learning that Accountants will come close to using AI. When they begin using AI into their work, we can say, they have embraced it successfully. This process is imperative to make the industry move to the opportunities created by AI, and to shield themselves from threats.</p>
R5	<p>The most prominent advice or rather motivation booster for Accountants to embrace AI would be by emphasizing the importance of looking at their inclining growth</p>

	through AI – and thereby all the reason to stay ahead of the game. This is because by looking ahead , Accountants can realize the cost benefit and operating efficiency it will bring to the business, after Accountants master AI. So, Accountants should take a step back from being afraid and take a step forward in viewing AI as an opportunity for learning development . They will have a career advantage compared to their peers who are unaware about AI and the magnitude of its transformational opportunity .
R6	As an accountant, we should always be updated with latest information and knowledge . It is important to be made aware so that we are not left behind. This is how we take opportunities from it and adapt.
R7	The era of disruption is upon us and it is important that we develop the skills and expertise needed to face this challenge and stay competitive. Even as old models are disrupted and new models emerge , opportunities will remain. In this respect, one of the biggest challenges in seizing the opportunities presented lies in how businesses and employees respond in the face of disruption. Certainly, businesses must remain nimble , and be able to anticipate and prepare for disruption. At the same time, employees must view learning as a lifelong journey and seek to continually develop deeper skills needed to navigate the disruption.
R8	This message is especially for the newcomers in the industry, particularly who are the young accountants. Every time, before watching Netflix, just read an article of digital disruption published by any international or local accountancy regulatory. This is the baby-step every accountant should take in order to gain a basic, yet correct understanding of disruption and the power of emerging technologies. It should actually begin at the universities itself, where undergraduates should read current affairs pertaining the accounting profession, so as to take decisions that allow them to enter the industry and sustain for a long period.
R9	It all begins from getting to know the concept of AI . It is surprising how many accountants are not familiar with AI and the disruption brought by it. This shows that personal effort is not taken in expanding the scope of knowledge. There are many accountants who omit to read and understand about AI, as they feel that IT is not their forte . However, it is important to understand that AI is not about IT but about the emerging technology that has the ability to augment the work you currently do.

Question 6

In your opinion, is AI likely to complement and alter the role of Accountants and the Accounting Profession or replace Accountants and the Accounting Profession?

Respondents	Responses
R1	<p>The right terminology is that AI is 'augmenting' AP and 'not replacing'. There are two words, 'harnesses' and 'augment'. With harnessing, we can be augment better. It is filling up the gap, thereby changing and altering the roles. This is the evolution of jobs where jobs are changing and at the same time, during this change, some are being replaced and new ones are created. It is a cycle of evolution. Although AI has exceptional proficiency and where replacement is concerned, the need of Accountant is still there in the sense of the new demands from the industry. The focus area is getting the right supply to the demands.</p>
R2	<p>AI has the potential to complement and replace the profession. However, looking at Accountants and the AP, it is more likely to help Accountants with their work – allowing them to reach greater heights of effectiveness and efficiency. Thus, AI is an enabler rather than a replace. However, in the midst of roles being changed, there are some roles that will be drastically transformed to new roles. This intensity of change can be said to have an equivalent role of replacing. But again, it is the alteration that AI would bring. For example, the accounting clerk who does bookkeeping manually now will have to learn how to use the AI-empowered software to do the bookkeeping. The role is the same, but the approach to completing the bookkeeping role is drastically modified by AI.</p>
R3	<p>AI is a complement to the AP because it will create more job opportunities. It will replace the roles in the sense that the change from one role to another makes the previous role to be vanished. This does not mean one will be out of job, instead your job description has been enhanced and upgraded to work with the new technology in pursuance of completing the same function. Thus, the ideology of 'replacement' ignites at the switch from one role to another, as it may be a drastic modification. Thus, if critically analyzed, it is changing the role, and not replacing the role, because it is the same role, but the execution has become different. This is when the adoption can be implied as 'choosing what is vital' to ease the way Accountants work, because Accountants value their work by putting a benchmark of price and if not with technology, the Accountants will not enjoy an improvement on productivity, effectiveness and efficiency. Also, thinking based on an 'Accountant-Client' scenario, the help of technology will make the Accountant's input to increase the productivity of their clients. So, Accountants shall using their strength of their levy to transform other parts of organization, thereby benefiting the ecosystem as a whole.</p>
R4	<p>There may be certain routine tasks that are easier replaced by AI and these will be the first phase. The more complex tasks may be replaced later as AI becomes more capable. There will be certain areas which may not be replaceable in the interpretation of financials and judgment areas in decision making</p>
R5	<p>AI is likely to alter accountant's job scope but unlikely to replace an accountant's role. This is because AI is improving the way Accountants do work</p>

	and not exactly snatching away their roles and practices, as it is created to complement and aid human , rather than to play a dominating role.
R6	AI will only alter the role of Accountants and the AP. The wonderful thing about human brain and what makes it special is, we are gifted with senses. Our brains do not just stimulate based on data but also, feelings and judgment. AI could not incorporate such thing no matter how advance it is. This what makes the decision making process should still be made by human.
R7	The theory is simple, if accountants maximize the capacity of TEA, they are likely to enjoy a positive impact and thereby prevent their roles from getting replaced by AI. This does not mean to prevent AI from collaborating with accountants in enhancing their work, instead it emphasizes on the environment where accountant's work hand-in hand and side-by-side with AI. The idea is to not allow AI do all the work, but to work with AI to complete the accounting work with a balance of human and tech touch .
R8	In truism, AI cannot replace an accountant or the AP. The term replacement is a misleading word that creates unnecessary fear. It is the process of drastic modification in the roles and job descriptions of accountants. This is because AI is an aid rather than a creation to overpower humans. Thus, AI is to complement and alter to role of accountants. However, this will not happen if accountants do not show enthusiasm towards adopting and implementing AI.
R9	Evolution is about old becoming new . Digital evolution is about old technology becoming new technology . Thus, every aspect related to technology will also be required to change from old to new. Since the AP leverages technology , it is experiencing the old to new transformation in terms of the old business models becoming new to create a better value proposition . Regardless of this change, there are always opportunities, and since the accountants are observed to move forward in tapping this opportunities , then the technology is likely to complement their roles and enhance their expertise .

Question 7

How long (in years) would it take for the waves of disruption led by AI to transform the Accounting Profession? If so, why?

Respondents	Responses
R1	The time period is not easy to gauge because it really depends on the whole ecosystem and global economy as AP works in tandem with the business community as well as sectorial growth . But there is a percentage increase year-on-year in terms of harnessing the transformation as besides the transformation at big firms, small firms, like 3E have also begun embracing AI like ZERO (image recognition for invoices) for their process. Also, besides the high-skilled Accountants, the low-skilled Accounting technicians are also using AI software and tools to execute their work. Their work is same, but the execution is different – making it more structured. Against this backdrop, it can be gauged that it would not take long, probably 3 to 6 years duration.
R2	The timeline is unpredictable . In 1973 the first mobile phone was invented, in 1992 the first smart phone was invented, now we have foldable phone screens. Against this backdrop, it can be gauged that it would not take long, probably 3 to 6 years duration.
R3	AI would transform within approximately 5 to 10 years . However, the changes will be on a staggered form, rather than at one instance.
R4	Approximately, the transformation can be gauged to happen in 5-10 years based on the present technology advancement . There will be resistance in adoption in the earlier years, but once the cost of adoption decreases and successful adoption becomes more widespread, the adoption will accelerate in the later years.
R5	It is not going to be very long. Approximately 1 to 2 years , because Accountants are already using AI to work .
R6	It is already happening . Technology, businesses and of course accounting are moving in tandem .
R7	AI would transform within approximately 5 to 10 years . However, the changes will be on a staggered form, rather than at one instance.
R8	Based on the verdict of regulatory like MIA, it is already happening.
R9	AI would transform within approximately 5 to 10 years . However, the changes will be on a staggered form, rather than at one instance.

Question 8

What is your view on the continuity of the Accounting Profession with the intervention of AI?

Respondents	Responses
R1	The AP is very wide and the continuity status lies in the foundation or founding role of the profession , which is the accounting and finance knowledge itself and the role of taking core of the financials of the organizations. These two aspects are the core nature of the AP and which shall continuously need the human touch – thereby sufficient to have the profession continue for indefinite period of time. This is because human knowledge is not something AI can easily emulate and AI is developed by human, and in developing AI, human knowledge is needed. As far as human knowledge is needed , the human part of the AP is still there. In future, the AP shall be humans and robots working together . Human being cannot be taken out of the system altogether, otherwise the world will be full of robots which is not practical . Psychologically, for a moment, it would seem AI will replace Accountants, with the speed technology is disrupting, but with introspection, one will find out that it is just a cycle, the cycle of evolution , and that AP is to live.
R2	The ideology of positioning AI as an enabler makes Accountants better Accountants, because it is boosting the manner in which they would carry out their roles and practices . With this enabling effect , it makes Accountants move with the flow of disruption . If Accountants are to move, they are not going to be left at the sidelines, thus protecting their relevance, hence continuity .
R3	There will be sustainability towards the profession. It is imperative to understand that Accounting is a profession of professionals – with Accountants holding the professional status and having the authority to sign on financial statements. The responsibility and accountability is very much higher than many other professions other there. The AP can be equated with Lawyers and Doctors, thus having great liability. Thus, the intervention of AI will definitely bring about continuity and sustainability – in the idea of having AI helping us venture into new businesses and new services. For example, clients may demand certain services which Big4 may not be providing, but with AI, it enables the accounting firms to cater for assorted services on demand. Therefore, the continuity stands at a 75% to 90% chance of longevity – in other words a strong continuity .
R4	It will change the profession but the continuity status majorly depends on how the profession copes with the advancement of AI. It is certain that the profession will survive.
R5	The manner in which Accountants embrace AI will reveal the continuity status of the AP. With embracement and addressing AI as the aid to work at a higher level of efficiency and effectiveness, Accountants are to craft the continuity of the profession on a sustainable basis, rather than halting the relevance and longevity of the profession . Thus, it is to continue .
R6	The wonderful thing about human brain and what makes it special is, we are gifted with senses. Our brains do not just stimulate based on data but also, feelings and judgment . AI could not incorporate such thing no matter how advance it is. This

	what makes the decision making process should still be made by human . Against this backdrop, AP will always be needed.
R7	The intervention of AI will definitely bring about continuity and sustainability – in the idea of having AI helping us venture into new businesses and new services . The accountants are said to do more than before, especially with AI. Thus, accountants must leverage AI to increase the number of services they provide, thereby gaining competitive edge. This is a message especially for the continuity of the small accounting firms who have the vision to expand in future.
R8	The digital technologies are evolving and so is the AP. In evolution, it is just the process of moving from one dimension to the other. In this case, moving from the basic-software to the AI-empowered software dimension. Thus, there is no issues pertaining the going concern of the profession. It is taking time in for Malaysia to move into the digital world, but it does not mean it is not moving. The idea is to continue moving. The pace is secondary and can be controlled by the regulator's initiatives.
R9	Digitalization is a complete abode of opportunities . It is not easy for a revolutionary like AI to halt the continuity of large professions like AP especially when they bring opportunities during their venture into AP. It is harder when the development of AI for AP requires accountants . This is because AI cannot be developed for a technical profession like AP without accountants. This is when, before collaboration with AI, the accountants are demanded to collaborate with tech-developers so that AI can be developed to disrupt the profession for the good. Against this backdrop, AI will definitely bring about continuity and sustainability .

4.2.3.2. Contextual Coding Analysis for Level of Influence Paradigm

Based on the responses for the remaining 5 questions presented above, the following information is the contextual coding analysis performed through extracting the most important pointers, grouping them and labelling them with preliminary codes and then regrouping them into broader codes known as themes, so that they reflect increasingly broader perspectives. In short, it is the process of filtering the complex data collected from the original interview responses, so as to merge with quantitative data results, to perform further data analysis and interpretation.

Table 4.26: Contextual coding Analysis for Level of Influence Paradigm

Respondents	Preliminary Codes	Final Codes (Themes)
Question 4: The level of positive or negative influence of AI on Accounting Profession is likely to be decided based on the ‘tech-embracing ability’ of Accountants. (This means, if they embrace it, they are likely to enjoy a positive impact, and if not, vice versa). How importantly do you view this?		
R1	<ul style="list-style-type: none"> • Unaffordable not to follow tech-trends 	<ul style="list-style-type: none"> • Indispensable • Mandatory Trend
R2	<ul style="list-style-type: none"> • Embrace is the only way • Digital evolution • Technology beyond imagination 	<ul style="list-style-type: none"> • Indispensable • Uttermost Imperative Concept
R3	<ul style="list-style-type: none"> • Timing is key • AP facing positive embracement currently • Profession-wide initiative • Awareness stage 	<ul style="list-style-type: none"> • Indispensable • Crucial Ability
R4	<ul style="list-style-type: none"> • Ecosystem disruption • Combat the negative for the positive 	<ul style="list-style-type: none"> • Indispensable • Tool for Enhancement
R5	<ul style="list-style-type: none"> • Defend the threats • Enabler not destructor 	<ul style="list-style-type: none"> • Indispensable • Jewel of Adoption
R6	<ul style="list-style-type: none"> • To be at advantage • Improve understanding level 	<ul style="list-style-type: none"> • Indispensable • Epitome of Evolution

Artificial Intelligence as a Paradoxical Digital Disruptor in the Accounting Profession.

	<ul style="list-style-type: none"> • Combat fear and negative thoughts 	
R7	<ul style="list-style-type: none"> • TEA only tool • Values and Virtues • Effective principles • New habit • Necessity 	<ul style="list-style-type: none"> • Indispensable • Epitome of excellence
R8	<ul style="list-style-type: none"> • Accurate measure • Uncertainty is certain • Change is constant • TEA as a tool for collaboration • TEA teaches correct adoption • Guiding abilities 	<ul style="list-style-type: none"> • Indispensable • Guiding elements
R9	<ul style="list-style-type: none"> • Arduous journey without TEA • Right thinking • Thinking of excellence • Long-term process 	<ul style="list-style-type: none"> • Indispensable • Right Thinking

Respondents	Preliminary Codes	Final Codes (Themes)
Question 5: How would you encourage Accountants to embrace AI? What is your advice or suggestions to the Accountants today?		
R1	<ul style="list-style-type: none"> • Agile • Open Mindset • Willing to change • Embrace change management • Access digital technology trends • Identify capabilities • Harness digital technology • Funding management 	<ul style="list-style-type: none"> • Flexibility • Culture of Change • Mindset Shift
R2	<ul style="list-style-type: none"> • Digital strategy • Change attitude 	<ul style="list-style-type: none"> • Strategic Vision • Culture of Change
R3	<ul style="list-style-type: none"> • Regulators key players • Awareness and understanding 	<ul style="list-style-type: none"> • Strategic Vision • Culture of Change

Artificial Intelligence as a Paradoxical Digital Disruptor in the Accounting Profession.

	<ul style="list-style-type: none"> • Technology Blueprints • Management vision 	<ul style="list-style-type: none"> • Mindset Shift • Understanding
R4	<ul style="list-style-type: none"> • Learning • Urge to know more 	<ul style="list-style-type: none"> • Understanding
R5	<ul style="list-style-type: none"> • Accountant's inclining growth • Cost-benefit • Operational-efficiency • Learning development • Forward-looking mindset 	<ul style="list-style-type: none"> • Strategic Vision • Mindset Shift • Culture of Change • Sense of Urgency
R6	<ul style="list-style-type: none"> • Learning urge • Updated with latest information 	<ul style="list-style-type: none"> • Understanding
R7	<ul style="list-style-type: none"> • Seize opportunities • Remain nimble • Anticipate change • Prepare for change • Learning a lifelong journey 	<ul style="list-style-type: none"> • Understanding • Strategic Vision • Culture of Change • Mindset Shift
R8	<ul style="list-style-type: none"> • Reading journals • Reading articles • Current-affair awareness 	<ul style="list-style-type: none"> • Understanding
R9	<ul style="list-style-type: none"> • Personal effort • Understanding is primary • IT is not a forte • Understand the disruption of IT • Understand augmentation • Get terminologies right 	<ul style="list-style-type: none"> • Understanding • Culture of Change • Sense of Urgency

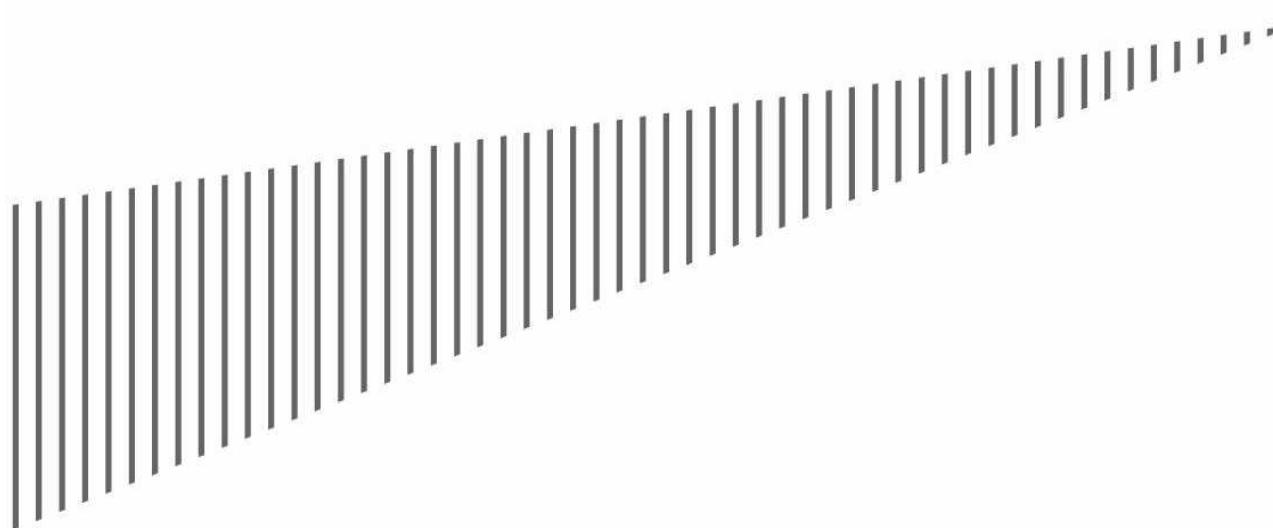
Respondents	Preliminary Codes	Final Codes (Themes)
Question 6: In your opinion, is AI likely to complement and alter the role of Accountants and the Accounting Profession or replace Accountants and the Accounting Profession?		
R1	<ul style="list-style-type: none"> • Augmenting, not replacing • Replaced job become new jobs • Cycle of evolution • New demands from industry • Right supply to demands 	<ul style="list-style-type: none"> • Complement and Alter • Augmenting
R2	<ul style="list-style-type: none"> • Enabler, not replacer • Drastic transformation is alteration, not replacement • Same role, different approach in execution 	<ul style="list-style-type: none"> • Complement and Alter • Enabling Effect
R3	<ul style="list-style-type: none"> • More job opportunities • Role change from one to another, not equivalent to replacement • Enhanced job description • Drastic transformation is alteration, not replacement • Same role, different approach in execution 	<ul style="list-style-type: none"> • Complement and Alter • Role Upgrade
R4	<ul style="list-style-type: none"> • Routine tasks replacement • Complex task alteration • Decision-making irreplaceable 	<ul style="list-style-type: none"> • Transform Routine Task • Complement and Alter Complex Roles
R5	<ul style="list-style-type: none"> • Improving work-execution • Human-aiding agent 	<ul style="list-style-type: none"> • Complement and Alter • Aid to solutions
R6	<ul style="list-style-type: none"> • Human senses irreplaceable • Decision-making irreplaceable 	<ul style="list-style-type: none"> • Complement and Alter • Augmenting
R7	<ul style="list-style-type: none"> • Maximize TEA capacity • Aim for niche • Prevent being replaced • Balance between human and tech touch 	<ul style="list-style-type: none"> • Complement and Alter • Role Upgrade
R8	<ul style="list-style-type: none"> • Replacement is not right terminology 	<ul style="list-style-type: none"> • Complement and Alter • Enabling Effect

	<ul style="list-style-type: none"> • Drastic transformation is disruption • AI as an aiding agent • AP to portray significant embracement 	
R9	<ul style="list-style-type: none"> • The old becomes new • Business model transformation • Create better value proposition 	<ul style="list-style-type: none"> • Complement and Alter • Clarify Misconceptions

Respondents	Preliminary Codes	Final Codes (Themes)
Question 7: How long (in years) would it take for the waves of disruption led by AI to transform the Accounting Profession? If so, why?		

R1	<ul style="list-style-type: none"> • Depends on ecosystem • Depends on global economy • Depends on sectorial growth • AP in tandem with business 	<ul style="list-style-type: none"> • Unpredictable • Assumption: 3 to 6 years
R2	<ul style="list-style-type: none"> • Evolution cycle • Depends on ecosystem 	<ul style="list-style-type: none"> • Unpredictable • Assumption: 3 to 6 years
R3	<ul style="list-style-type: none"> • Staggered transformation • Not transformation at instance 	<ul style="list-style-type: none"> • Assumption: 5 to 10 years
R4	<ul style="list-style-type: none"> • Intensity of technology advancement • Potency of digital innovation 	<ul style="list-style-type: none"> • Assumption: 5 to 10 years
R5	<ul style="list-style-type: none"> • AI is being used already • Evolution is happening 	<ul style="list-style-type: none"> • Assumption 1 to 2 years
R6	<ul style="list-style-type: none"> • Already happening now • IR4.0 	<ul style="list-style-type: none"> • Currently happening
R7	<ul style="list-style-type: none"> • Depends on global economy • Depends on sectorial growth • AP in tandem with business 	<ul style="list-style-type: none"> • Unpredictable
R8	<ul style="list-style-type: none"> • Evolution cycle • Depends on ecosystem 	<ul style="list-style-type: none"> • Unpredictable
R9	<ul style="list-style-type: none"> • Not transformation at instance 	<ul style="list-style-type: none"> • Unpredictable

Respondents	Preliminary Codes	Final Codes (Themes)
Question 8: What is your view on the continuity of the Accounting Profession with the intervention of AI?		
R1	<ul style="list-style-type: none"> • Founding role of the profession • Accounting finance knowledge • Core organizational financials • Human touch needed • Humans and robots working together • Cycle of evolution 	<ul style="list-style-type: none"> • Continuity Established • Foundational role of AP
R2	<ul style="list-style-type: none"> • Enabling effect of technology • Move with flow of disruption 	<ul style="list-style-type: none"> • Continuity Established • Enabling attribute of AI
R3	<ul style="list-style-type: none"> • Sustainability • Profession of professionals • Venture into new business and services • 75% to 90% change of longevity 	<ul style="list-style-type: none"> • Continuity Established • Professional Industry • Assorted Services Demand
R4	<ul style="list-style-type: none"> • Change the profession • Embracing ability 	<ul style="list-style-type: none"> • Continuity Established • Endurance of AP with technology advancement
R5	<ul style="list-style-type: none"> • Change the profession • Embracing ability 	<ul style="list-style-type: none"> • Continuity Established • Accountants are crafters of continuity
R6	<ul style="list-style-type: none"> • Human decision making needs • Human brain judgments 	<ul style="list-style-type: none"> • Continuity Established • Power of Human Brain
R7	<ul style="list-style-type: none"> • Sustainability • Profession of professionals • Venture into new business and services 	<ul style="list-style-type: none"> • Continuity Established • Human and Tech Stability
R8	<ul style="list-style-type: none"> • Change the profession • Embracing ability 	<ul style="list-style-type: none"> • Continuity Established • Aiding Agent
R9	<ul style="list-style-type: none"> • Change the profession • Embracing ability 	<ul style="list-style-type: none"> • Continuity Established • Industrial Shift



CHAPTER 5

RESEARCH FINDINGS

DOCUMENT FLOW

For this Section Only

5.0 Introduction

5.1 Quantitative Data Findings

5.1.1 Relationship Paradigm

5.1.1.1 Pearson Correlation Coefficient Test

5.1.1.2 Multiple Linear Regression Test

5.1.2 Level of Influence Paradigm

5.1.2.1 Pearson Correlation Coefficient Test

5.1.2.2 Multiple Linear Regression Test

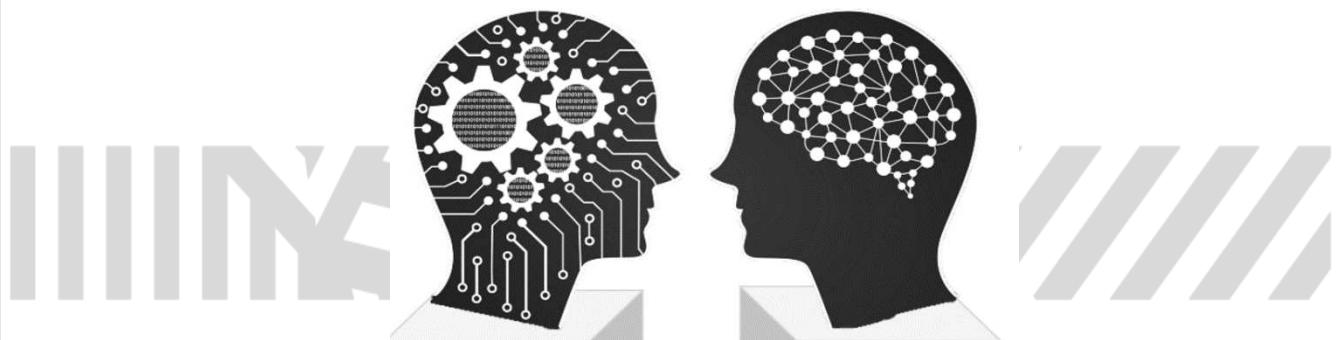
5.2 Qualitative Data Findings

5.2.1 Relationship Paradigm

5.2.2 Level of Influence Paradigm

5.3 Point of Interface: Merging of Results

5.4 Solving the Research Problem



5.0 Introduction

This chapter allocates importance to data findings based on the data collected, presented and analyzed. This chapter is an extension of chapter 4. Since this study adopts mixed methods, the data findings appears to be in two forms, namely, quantitative and qualitative.

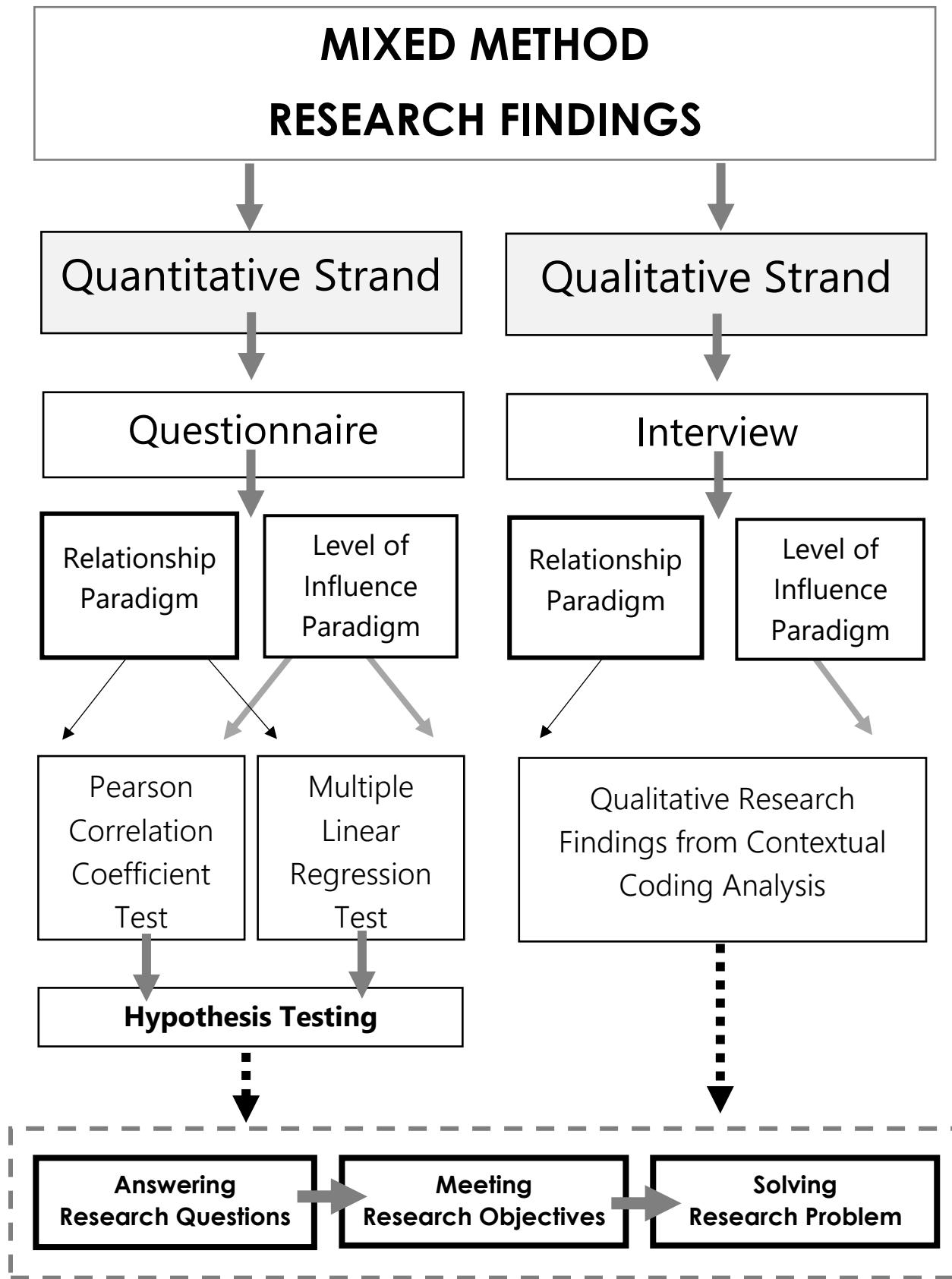
Based on the convergent mixed method standards, the quantitative and qualitative data findings which is to be extended (quantitative) and extracted (qualitative) from chapter 4 is required to be performed separately. Thus, this chapter is split into two sections in which the first section presents the quantitative strand findings by carrying out multiple tests specific to quantitative approach using SPSS software. Then, the chapter continues with the second section that presents the qualitative strand findings by revisiting and summarizing the themes generated from contextual coding analysis.

It is imperative to understand that the research carries out a study on one area only, but there are two paradigms in that area, which is the ‘Relationship Paradigm’ and “Level of Influence Paradigm”. The second paradigm is an extension of the first paradigm and both paradigm have to be studied and experimented one after another in order to provide a complete understanding of the phenomenon preached by the topic of this research study. The paradigms are related and cannot exist without each other. Thus, the quantitative and qualitative data findings shall be performed for both paradigms, separately.

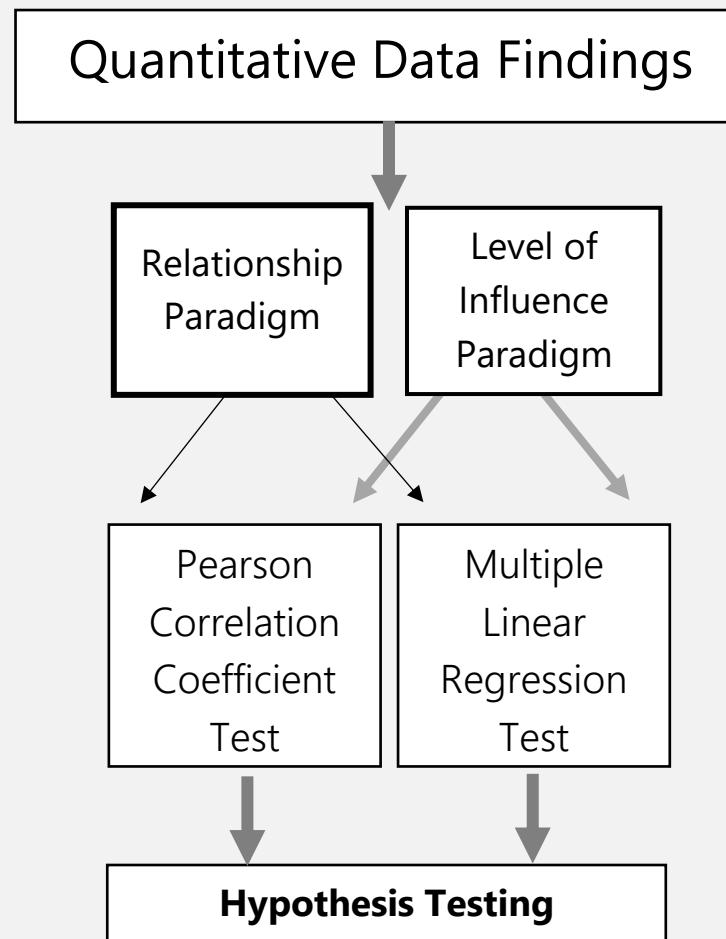
The chapter continues with ‘merging’ of the quantitative and qualitative findings in table format to show how the data is ‘related’ and can be ‘connected’ to ‘explain’ the results. Upon merging, the chapter extends in interpreting the merged findings and linking it to how it settles hypothesis, answers research questions, meets research objectives and finally solve the research problem.

However it is important to understand that the interpretation shall always begin with the quantitative interpretation which is supported by qualitative findings. This is because the aim of convergent mixed method is to provide a complete understanding of the phenomenon studied by this research.

The format of this chapter is illustrated in the next page. The readers are encouraged to closely read and understand the illustration to recognize the cohesion and coherence strategy adopted for this chapter.



QUANTITATIVE STRAND



QUANTITATIVE DATA FINDINGS

for

RELATIONSHIP PARADIGM

5.1.1.1 Pearson Correlation Coefficient Test for Relationship Paradigm

The doctrine of Correlation is determined in finding the relationship between two variables, such as independent and dependent variable. This doctrine is brought into practice by conducting the **Pearson Correlation Coefficient Test** using the Bivariate Index that measures the strength and direction of linear relationship between two variables.

The results obtained from this test must be interpreted according to certain essential requirements – that is the results derived should be between -1 and +1 ($-1 < r > +1$), and that values nearer to +1 demonstrate a high positive relationship between the two variables, whereas, values nearer to -1 indicate that there is high negative relationship between the two variables. Consequently, values nearer to 0 indicate no relationship between two variables. The positive relationship indicate the momentum of the two variables to move and change in same direction (one increases with the increase of the other, vice versa) whereas negative relationship define the momentum of the two variables to move and change at opposite directions (one increases, the other decreases; vice versa).

Besides the Pearson Correlation r value, the Pearson Correlation Coefficient Test using the Bivariate Index also discloses the significance of the relationship through the value of Sig (2-tailed). The association of the value with significance is that if the Sig (2-tailed) value is higher than 0.05, then there is no significance in the relationship between two variables. Conversely, if the value obtained is lower than 0.05, then the relationship is significant.

Exhibit 5.1: Range of Correlation Coefficient, r

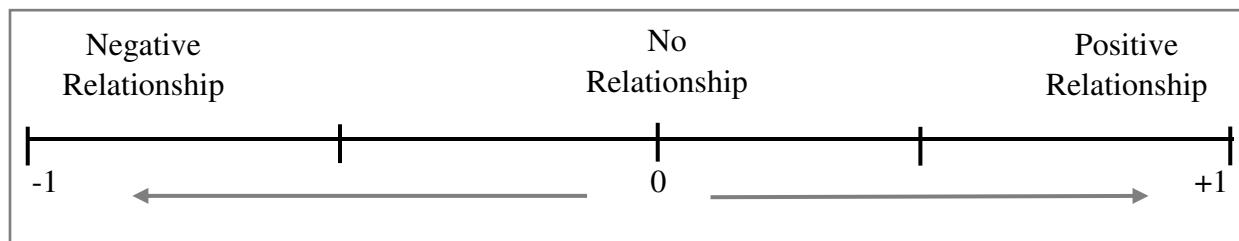


Exhibit 5.2: Range of Significance, Sig (2-tailed)

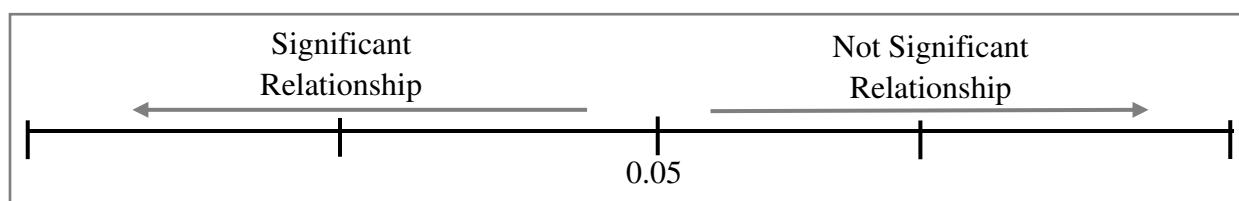


Exhibit 5.3 Results of Pearson Correlation Test between DV and IVs

Correlations for Relationship Paradigm				
	DV_Evolving Role of Accountants in the Accounting Profession	IV_AI as Opportunity Creator	IV_AI as Threat Igniter	
DV_Evolving Role of Accountants in the Accounting Profession	Pearson Correlation	1	.110	-.263
	Sig. (2-tailed)		.000	.000
	N	120	120	120
IV_AI as Opportunity Creator	Pearson Correlation	.110	1	.572**
	Sig. (2-tailed)	.000		.000
	N	120	120	120
IV_AI as Threat Igniter	Pearson Correlation	-.263	.572**	1
	Sig. (2-tailed)	.000	.000	
	N	120	120	120

**. Correlation is significant at the 0.01 level (2-tailed).

Source: Primary Data

The Exhibit 5.3 illustrates there is a **positive correlation of 0.110** between DV (evolving role of accountants in the AP) and IV (AI as opportunity creator), because the **value is above 0, towards +1**. This can be implied that AI as opportunity creator is able to express evolving role of accountants in the AP with **11.0%**, showing how AI is able to positively impact evolving role of accountants by creating opportunities. This correlation is supported by **Sig (2-tailed) value of 0.000** indicating the **positive correlation** to be **highly significant**, because the value is lower than **0.05**.

The Exhibit 5.3 illustrates there is a **negative correlation of -0.263** between DV (evolving role of accountants in the AP) and IV (AI as threat igniter), because the value is **below 0, towards -1**. This can be implied that AI as threat igniter is able to express evolving role of accountants in the AP with **26.3%**, showing how AI is able to negatively impact evolving role of accountants by creating threats. This correlation is supported by **Sig (2-tailed) value of 0.000** indicating the **negative correlation** to be **highly significant**, because the value is lower than **0.05**.

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The Exhibit 5.4 and Table 5.1 illustrates there is a **positive correlation** between DV (evolving role of accountants in the AP) and all the 6 opportunity creating IVs, because the values of all the 6 IVs are **above 0, towards +1**. This shows how AI is able to positively impact evolving role of accountants by creating opportunities through the 6 opportunity creating elements. This correlation is supported by Sig (2-tailed) values that make the **positive correlation** to be **highly significant**, because the value for all the 6 opportunity creating IVs is **lower than 0.05**. The values can be viewed in the table below.

Table 5.1: Results of Pearson Correlation Test between DV and the 6 Opportunity Creating IVs

Opportunity Creating IVs	Pearson Correlation, <i>r</i>	Sig (2-tailed)
Decision Support	.150 (15.0%)	.002
Interactive Learning and Teaching	.113 (11.3%)	.020
Intellectual Capacity and Expertise Storing	.239 (23.9%)	.000
Digital Management	.139 (13.9%)	.001
Data Proliferation	.248 (24.8%)	.001
Consistency and Error Reduction	.275 (27.5%)	.001

Source: Primary Data

The Exhibit 5.5 and Table 5.2 illustrates there is a **negative correlation** between DV (evolving role of accountants in the AP) and all the 6 threat igniting IVs, because the values of all the 6 IVs are **below 0, towards -1**. This shows how AI is able to negatively impact evolving role of accountants by igniting threats through the 6 threat igniting elements. This correlation is supported by Sig (2-tailed) values that make the **negative correlation** to be **highly significant**, because the value for all the 6 threat igniting IVs is **lower than 0.05**. The values can be viewed in the table below.

Table 5.2: Results of Pearson Correlation Test between DV and the 6 Threat Igniting IVs

Threat Igniting IVs	Pearson Correlation, <i>r</i>	Sig (2-tailed)
Exceptional Proficiency	-.233 (-23.3%)	.011
Data Specification	-.105 (-10.5%)	.003
Implementation Cost	-.244 (-24.4%)	.001
Programming Malfunction	-.241 (-24.1%)	.003
Complicated Algorithm	-.225 (-22.5%)	.001
Misconception	-.266 (-26.6%)	.001

Source: Primary Data

5.1.1.2 Multiple Linear Regression Test for Relationship Paradigm

Multiple regression is based on correlation but appears to be a more sophisticated extension of correlation that discovers the interrelationships amongst variables (more than one variable). It is used to ascertain the predictive ability of a set of IVs on one continuous dependent measure. This means it is interested in exploring the relationship between a number of IVs (predictors) and the DV. The outcome of test communicates how well the IVs are able to predict the DV. There are several multiple regression analyses, however this study adopts the “Multiple Linear Regression” analysis that models the linear relationship between the independent (explanatory) variable and dependent (response) variable, both being continuous.

Exhibit 5.6: Multiple Linear Regression between DV and the 6 Opportunity Creating IVs

Mod el	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.571 ^a	.326	.290	.65134	.326	9.109	6	113	.000

a. Predictors: (Constant), Consistency and Error Reduction, Decision Support, Interactive Learning and Teaching, Intellectual Capital and Expertise Storing, Digital Management, Data Proliferation
b. Dependent Variable: DV_Evolving Role of Accountants in the Accounting Profession

Source: Primary Data

The R represents the multiple correlation coefficient value derived from the difference between real and estimate value of the DV (Pallant, 2013). This means it is measuring the quality of prediction of the DV. The R value must be within the range of -1 to +1, where values closer to +1 imply positive relationship and values closer to -1 imply negative relationship. The Table 5.6 reveals the **R value** to be **0.571** that shows there is a **positive relationship** between the variables because the value is above **0, towards +1**. This is sensible because an increase in the influence of opportunity creating IVs, there will be instant increase in the DV that is the evolving role of accountants in the AP.

Concurrently, according to Pallant (2013), the R^2 value represents the coefficient of determination which is the proportion of variance in the DV expressed by IVs. The Table 5.6 reveals the **R^2 value** to be **0.326**. This means the 6 opportunity creating IVs are able to explain **32.6%** of the DV in the study and the remaining 67.4% of the DV can be positively influenced by several other opportunity creating factors.

Exhibit 5.7: Analysis of Variance (ANOVA^a) between DV and the 6 Opportunity Creating IVs

ANOVA ^a					
Model	Sum of Squares	df	Mean Square	F	Sig.
1	Regression	23.172	6	3.862	9.109
	Residual	47.856	113	.424	
	Total	71.028	119		

a. Predictors: (Constant), Consistency and Error Reduction, Decision Support, Interactive Learning and Teaching, Intellectual Capital and Expertise Storing, Digital Management, Data Proliferation
b. Dependent Variable: DV_Evolving Role of Accountants in the Accounting Profession

Source: Primary Data

The Analysis of Variance (ANOVA) determine the influence that IVs have on the DV under the regression analysis. This is done by splitting the total variability of DV into systematic and random factors in which the systematic factors have influence on DV and random factors omit to have any influence (Pallant, 2013).

According to Pallant (2013), the Regression Sum of Squares resemble the amount of variance in the DV whereas the Residual Sum of Squares represent just like the residue of a solution which usually is not considered after adoption of regression model. The addition of Regression and Residual Sum of Squares leads to the Total Sum of Squares that represents the total sum of variance in the DV. However, the model should be addressed by the difference between the Total Sum of Squares and the Residual Sum of Squares amounting to the Regression Sum of Squares (**71.028 - 47.856=23.172**).

The df is an abbreviation for ‘degree of freedom’. It is a terminology used to address the number of independent variables. It is calculated by subtracting 1 from the number of variables ($df = n-1$).

The Exhibit 5.7 illustrates that **the Regression df is 6 (df: 7-1=6)** which means the degree of freedom is generated by 7 variables that are the 6 opportunity creating IVs and 1 DV. **The Residual df** is according to the sample size received from the responses that is a total of 120 responses, where from the 120 sample size, the 7 variables are deducted from sample size to obtain **113 (120-7=113)**. The 113 is the residue. The **Total df** is the sum of Regression and Residual df amounting **119**, that is 1 less than sample size 120 because of the subtracted 1 from the number of variables ($df = n-1$). Based on this analysis of the df, it can be deduced that there is a positive relationship between sample size and df value, where, as sample size increases, the df value also increases.

The F is an alphabet that represents the name ‘Fisher’ (Ronald Fisher) who is the inventor of the ANOVA in 1918, which makes ANOVA to be, in truism, Fisher’s Analysis of Variance. The F value is a ratio (F-Ratio) which communicates if the regression model chosen is a good fit for the data analyzed. The Table 5.7 illustrates the **F-ratio** to be **9.109** which is derived from dividing the value of Regression of Mean Square with the value of Residual of Mean Square (**3.862/0.424=9.109**). This shows that there is variance which exist, and the data is not free from having no real variance, which shows that it is far away from having the null hypothesis to be accepted.

The Sig. value represents ‘significance’ level of ANOVA. The Sig. value must be less than or equal to 0.05 (($Sig\text{-value} \leq 0.05$) in order for the relationship between IVs and DV to be addressed as significant and for the null hypothesis to be rejected. The Table 5.7 supports this by illustrating the **Sig. value** to be **0.000** which is **lower than 0.05**. This means that the **positive relationship between the 6 opportunity creating IVs and DV is significant** which makes AI as Opportunity Creator to have a significant positive relationship and influence on the Evolving Role of Accountants – **hence strongly rejecting the null hypothesis.**

Exhibit 5.8: Multiple Linear Regression between DV and the 6 Threat Igniting IVs

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	-.535 ^a	.286	.248	.66987	.286	7.544	6	113	.000

a. Predictors: (Constant), Exceptional Proficiency, Complicated Algorithm, Programming Malfunction, Data Specification, Implementation Cost, Misconception
 b. Dependent Variable: DV_Evolving Role of Accountants in the Accounting Profession

Source: Primary Data

The R represents the multiple correlation coefficient value derived from the difference between real and estimate value of the DV (Pallant, 2013). This means it is measuring the quality of prediction of the DV. The R value must be within the range of -1 to +1, where values closer to +1 imply positive relationship and values closer to -1 imply negative relationship. The Table 5.8 reveals the **R value** to be **-0.535** that shows there is a **negative relationship** between the variables because the value is **below 0, towards -1**. This is sensible because an increase in the influence of threat igniting IVs, there will be an instant decreases the DV that is the evolving role of accountants in the AP.

Concurrently, according to Pallant (2013), the R^2 value represents the coefficient of determination which is the proportion of variance in the DV expressed by IVs. The Table 5.8 reveals the **R^2 value** to be **0.286**. This means the 6 threat igniting IVs are able to explain **28.6%** of the DV in the study and the remaining 71.4% of the DV can be negatively influenced by several other threat igniting factors.

Exhibit 5.9: Analysis of Variance (ANOVA^a) between DV and the 6 Threat Igniting IVs

ANOVA ^a					
Model	Sum of Squares	df	Mean Square	F	Sig.
1	Regression	20.322	6	3.387	7.544
	Residual	50.706	113	.449	
	Total	71.028	119		

c. Predictors: (Constant), Exceptional Proficiency, Complicated Algorithm, Programming Malfunction, Data Specification, Implementation Cost, Misconception
d. Dependent Variable: DV_Evolving Role of Accountants in the Accounting Profession

Source: Primary Data

The Analysis of Variance (ANOVA) determine the influence that IVs have on the DV under the regression analysis. This is done by splitting the total variability of DV into systematic and random factors in which the systematic factors have influence on DV and random factors omit to have any influence (Pallant, 2013).

According to Pallant (2013), the Regression Sum of Squares resemble the amount of variance in the DV whereas the Residual Sum of Squares represent just like the residue of a solution which usually is not considered after adoption of regression model. The addition of Regression and Residual Sum of Squares leads to the Total Sum of Squares that represents the total sum of variance in the DV. However, the model should be addressed by the difference between the Total Sum of Squares and the Residual Sum of Squares amounting to the Regression Sum of Squares (**71.028-50.706=20.322**).

The df is an abbreviation for ‘degree of freedom’. It is a terminology used to address the number of independent variables. It is calculated by subtracting 1 from the number of variables (df = n-1). The Exhibit 5.9 illustrates that the **Regression df** is **6 (df: 7-1=6)** which means the degree of freedom is generated by 7 variables that are the 6 threat igniting IVs and 1 DV. The **Residual df** is according to the sample size received from the responses that is a total of 120 responses, where from the 120 sample size, the 7 variables are deducted from sample size to obtain **113 (120-7=113)**. The 113 is the residue. The **Total df** is the sum of Regression and Residual df amounting **119**, that is 1 less than sample size 120 because of the subtracted 1 from the number of variables (**df = n-1**).

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Based on this analysis of the df, it can be deduced that there is a positive relationship between sample size and df value, where, as sample size increases, the df value also increases.

The F is an alphabet that represents the name ‘Fisher’ (Ronald Fisher) who is the inventor of the ANOVA in 1918, which makes ANOVA to be, in truism, Fisher’s Analysis of Variance. The F value is a ratio (F-Ratio) which communicates if the regression model chosen is a good fit for the data analyzed. The Table 5.9 illustrates the **F-ratio** to be **7.544** which is derived from dividing the value of Regression of Mean Square with the value of Residual of Mean Square (**3.387/0.449=7.544**). This shows that there is variance which exist, and the data is not free from having no real variance, which shows that it is far away from having the null hypothesis to be accepted.

The Sig. value represents ‘significance’ level of ANOVA. The Sig. value must be less than or equal to 0.05 ((Sig-value \leq 0.05) in order for the relationship between IVs and DV to be addressed as significant and for the null hypothesis to be rejected. The Table 5.9 supports this by illustrating the **Sig. value** to be **0.000** which is **lower than 0.05**. This means that the **negative relationship between the 6 threat igniting IVs and DV is significant** which makes AI as Threat Igniter to have a significant negative relationship and influence on the Evolving Role of Accountants – hence **strongly rejecting the null hypothesis.**

QUANTITATIVE DATA FINDINGS

for

**LEVEL OF INFLUENCE
PARADIGM**

5.1.2.1 Pearson Correlation Coefficient Test for Level of Influence Paradigm

The Exhibit 5.8 and Table 5.3 illustrates there is a **positive correlation** between the DV (evolving role of accountants in the AP) and all the 6 tech-embracing abilities (TEA) of accountants, because the values of all the 6 TEA are **above 0, towards +1**. This correlation is supported by **Sig (2-tailed)** values that make the **positive correlation to be highly significant**, because the value for all the 6 abilities is **lower than 0.05**.

This shows that TEA are related and play a vital role in evolving the role of accountants, in the sense that when there is an increase in adoption of embracing abilities, there is likely to be an increase in the role of accountants being evolved and transformed by AI, positively. Since there is positive correlation with high significance, the accountants in the AP will have their roles experience the opportunities created by AI, thereby being positively impacted with significant level of influence.

Based on these results and articulation, it clearly indicates that the accountants and the AP as a whole shall be complement rather than being replaced by AI, which eventually reveals the continuity status of AP to be established at positive and significant sustainability, rather than being halted.

Table 5.3: Results of Pearson Correlation Test between DV and the 6 Tech-Embracing Abilities

The 6 Tech-Embracing Abilities	Pearson Correlation, r	Sig (2-tailed)
Strategic Vision for Implementing AI	.511 (51.1%)	.000
Flexibility	.425 (42.5%)	.003
Culture of Change	.490 (49.0%)	.003
Mindset Shift	.411 (41.1%)	.001
Understanding	.536 (53.65)	.000
Sense of Urgency	.358 (35.8%)	.001

Source: Primary Data

5.1.2.2 Multiple Linear Regression Test for Level of Influence Paradigm

Exhibit 5.10: Multiple Linear Regression between DV and 6 Tech-Embracing Abilities

Model Summary of Tech-Embracing Ability to reveal Level of Influence									
Mode I	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.467 ^a	.218	.176	.66373	.218	5.250	6	113	.000

a. Predictors: (Constant), Strategic Vision, Flexibility, Culture of Change, Mindset Shift, Understanding of AI and Sense of Urgency.
b. Dependent Variable: DV_Evolving Role of Accountants in the Accounting Profession

Source: Primary Data

The R represents the multiple correlation coefficient value derived from the difference between real and estimate value of the DV (Pallant, 2013). This means it is measuring the quality of prediction of the DV. The R value must be within the range of -1 to +1, where values closer to +1 imply positive relationship and values closer to -1 imply negative relationship. The Table 5.10 reveals the **R value** to be **0.467** that shows there is a **positive relationship** between the variables because the value is **above 0, towards +1**. This is sensible because with an increase in the adoption of tech-embracing abilities, there will be instant increase in the DV (that is the evolving role of accountants in the AP) to experience a high level of positive opportunity creating influence.

Concurrently, according to Pallant (2013), the R^2 value represents the coefficient of determination which is the proportion of variance in the DV expressed by the Tech-Embracing Abilities (TEA). The Table 5.10 reveals the **R^2 value** to be **0.218**. This means the 6 TEAs are able to test the level of influence of AI on DV by **21.8%** and the remaining 78.2% of the level of influence of AI on DV can be tested by several other TEA factors.

Exhibit 5.11: Analysis of Variance (ANOVA) between DV and 6 Tech-Embracing Abilities

ANOVA ^a					
Model	Sum of Squares	df	Mean Square	F	Sig.
1	Regression	13.878	6	2.313	5.250
	Residual	49.781	113	.441	
	Total	63.659	119		

a. Predictors: (Constant), Strategic Vision, Flexibility, Culture of Change, Mindset Shift, Understanding of AI and Sense of Urgency.
 b. Dependent Variable: DV_Evolving Role of Accountants in the Accounting Profession

Source: Primary Data

The Analysis of Variance (ANOVA) determine how the TEAs can influence the DV to reveal the level of influence of AI on DV. This is done by splitting the total variability of DV into systematic and random factors in which the systematic factors have influence on DV and random factors omit to have any influence (Pallant, 2013).

According to Pallant (2013), the Regression Sum of Squares resemble the amount of variance in the DV whereas the Residual Sum of Squares represent just like the residue of a solution which usually is not considered after adoption of regression model. The addition of Regression and Residual Sum of Squares leads to the Total Sum of Squares that represents the total sum of variance in the DV. However, the model should be addressed by the difference between the Total Sum of Squares and the Residual Sum of Squares amounting to the Regression Sum of Squares (**63.659 - 49.781=13.878**).

The df is an abbreviation for ‘degree of freedom’. It is a terminology used to address the number of TEA variables. It is calculated by subtracting 1 from the number of variables ($df = n-1$). The Exhibit 5.11 illustrates that the **Regression df** is 6 (**df: 7-1=6**) which means the degree of freedom is generated by 7 variables that are the 6 TEAs and 1 DV. The **Residual df** is according to the sample size received from the responses that is a total of 120 responses, where from the 120 sample size, the 7 variables are deducted from sample size to obtain **113** (**120-7=113**). The 113 is the residue. The **Total df** is the sum of Regression and Residual df amounting **119**, that is 1 less than sample size 120 because of the subtracted 1 from the number of variables (**df = n-1**).

Based on this analysis of the df, it can be deduced that there is a positive relationship between sample size and df value, where, as sample size increases, the df value also increases.

The F is an alphabet that represents the name ‘Fisher’ (Ronald Fisher) who is the inventor of the ANOVA in 1918, which makes ANOVA to be, in truism, Fisher’s Analysis of Variance. The F value is a ratio (F-Ratio) which communicates if the regression model chosen is a good fit for the data analyzed. The Table 5.11 illustrates the **F-ratio** to be **5.250** which is derived from dividing the value of Regression of Mean Square with the value of Residual of Mean Square (**2.313/0.441=5.250**). This shows that there is variance which exist, and the data is not free from having no real variance, which shows that it is far away from having the null hypothesis to be accepted.

The Sig. value represents ‘significance’ level of ANOVA. The Sig. value must be less than or equal to 0.05 ((Sig-value \leq 0.05) in order for the relationship between IVs and DV to be addressed as significant and for the null hypothesis to be rejected. The Table 5.11 supports this by illustrating the **Sig. value to be 0.000** which is **lower than 0.05**. This means the **positive relationship between TEAs and DV is significant** – which implies that the DV is positively influence by TEAs, which shows that the accountants are going to embrace AI. Since they shall embrace AI, it shows that the DV shall be impacted by AI more positively than negatively. So, this confirms how AI will have a more significant level of opportunity creating influence on the evolving role of accountants than threat igniting influence. **Hence, strongly rejecting the null hypothesis.** Based on these results and articulation, it clearly indicates that the accountants and the AP as a whole shall be complement rather than being replaced by AI, which eventually reveals the continuity status of AP to be established at positive and significant sustainability, rather than being halted.

HYPOTHESIS TESTING

NO	HYPOTHESES		RESULTS
H1	H_0	There is no significant relationship between AI as <i>Opportunity Creator</i> and AP.	Rejected
	H_1	There is significant relationship between AI as <i>Opportunity Creator</i> and AP.	<input checked="" type="checkbox"/> Accepted
H2	H_0	There is no significant relationship between AI as <i>Threat Igniter</i> and AP.	Rejected
	H_1	There is significant relationship between AI as <i>Threat Igniter</i> and AP.	<input checked="" type="checkbox"/> Accepted
H3	H_0	There is no significant level of influence of AI as <i>Opportunity Creator</i> on AP based on the <i>Tech-Embracing Abilities</i> of Accountants.	Rejected
	H_1	There is significant level of influence of AI as <i>Opportunity Creator</i> on AP based on the <i>Tech-Embracing Abilities</i> of Accountants.	<input checked="" type="checkbox"/> Accepted

QUALITATIVE STRAND

Qualitative Data Findings

Relationship
Paradigm

Level of
Influence
Paradigm

Qualitative Data Findings
from Contextual Coding
Analysis

QUALITATIVE DATA FINDINGS

for

RELATIONSHIP PARADIGM

5.2.1 Relationship Paradigm

There were a total of 3 questions directed to the interviewees to obtain the view regarding the relationship between AI and AP.

The first question “*What is your view regarding the Accounting Profession’s collaboration with technology*” is crafted to obtain the view pertaining the convergence between AI and AP. This is because it is from the different descriptions of the convergence that one can find out the true nature and significance of the relationship.

The contextual coding analysis reveal that the interviewees address AI and AP to have a **significant affiliation** from the perspective of AP’s **consistent, continuous** and **enthusiastic** follow-up with the evolution of technology. The affiliation is further quoted to be an **ancient convergence** till AP has made technology become their **Key Success Factor (KSF)** as it is something that they cannot do without especially in the advent of digitalization that demands the AP to move from **bookkeeping to strategizing**. This shows how the collaboration is strengthened and sustained with the **leverage of technology** assisting accountants to **shift** from basic to **AI-powered software**. These themes clearly justify AI and AP to have a relationship that is **relevant**.

The second question “*how would you describe disruption in Accounting Profession*” relates to obtaining the view pertaining the type of relationship that exist between AI and AP, since AI is a paradoxical digital disruptor. This question does not intend to verify the opportunity creating or threat igniting factors, but intends to ascertain if there is an opportunity creating and threat igniting relationship between AI and AP. This is because, it is only from the theory of disruption that one can ascertain the paradoxical nature of AI and confirm if AI influences AP positively and negatively.

The contextual coding analysis reveal that the interviewees highlight technology to be the most **influential disruptor** in the advent of IR4.0. They address disruption as a **megatrend revolving** around the **ecosystem** just like an **uncertainty**. It is **inevitable** and is observed to impact different industries especially the accounting and finance industry by posing **opportunities and risks**.

This is the **dual impact** that AP experiences especially from the **disruptive technology**, AI – which **interrupts** the **status-quo** by being an **enabler** but **destructive** simultaneously. This **dual personality** is addressed to **complement** yet possesses the power to **replace** the role of accountants. However, is emphasized that the AI phenomenon is a **gist of transformation** and a **consequences of evolution**. The theory is simple - moving with digitalization can **positively affect value proposition**, if not, the accountants are to **halt** their **continuity**. These themes clearly **justify how the theory of disruption fit into understanding AI as a digital disruptor that impacts AP at a paradox – which is by creating opportunities and igniting threats, simultaneously.**

The third question “*what is your view on the opportunities created and threats ignited by AI? Should Accountants embrace it or fear form it*” relates to obtaining the view pertaining how the positivity or negativity of the relationship shall continue to exist, but this time, not based on AI, but based on the AP’s side (DV). This question intends to verify the sustainability of the positive or negative relationship based on two important actions of accountants “embrace” and “fear”. It is only based on these actions that one can verify and validate whether the AP is really being influenced by AI favorably and adversely.

The contextual coding analysis reveal that the interviewees highlight accountants to be both at ‘cheer’ and ‘fear’. This shows accountants are being influenced **favorably** and **adversely**. The **opportunities** foster AP to move towards **harnessing** AI whereas the **drawbacks** of AI **threaten** AP to move away from harnessing AI. There is two major consequences - either AP can **enjoy** being **complemented** by AI or **suffer** being **replaced** by AI. Regardless of the circumstance AI creates, the interviewees emphasize AP to take a step back from fearing and move forward to embrace. Amidst this, **fear** has only been given importance if it is taken as a **motivation** to embrace AI through **conscious introspection**. These themes clearly justify AI to influence AP and AP to be influenced by AI. Thus, it justifies the existence of a positive and negative relationship.

QUALITATIVE DATA FINDINGS

for

LEVEL OF INFLUENCE PARADIGM

5.2.2 Level of Influence Paradigm

There were a total of 5 questions directed to the interviewees to obtain the view regarding the level of influence paradigm. However, from the 5 question, the first 2 specifically relate to investigating the level of influence of AI and AP. The remaining 3 questions exist to collect supportive statements based on the results of the first 2 questions. This is because the response to the remaining 3 questions are depended on the response given for the first 2 questions.

The first question “*the level of positive or negative influence of AI on Accounting Profession is likely to be decided based on the ‘tech-embracing ability’ of Accountants. (This means, if they embrace it, they are likely to enjoy a positive impact, and if not, vice versa). How importantly do you view this*”? This question is crafted to obtain the view pertaining the feasibility of TEA to be a tool to measure the significant level of influence of AI on AP and to ascertain the level of influence of AI on AP in terms of whether AI is to more positively or more negatively to impact AP.

The contextual coding analysis reveal that the interviewees highlight the TEA to be the **only tool** at the moment that can **determine** how the accountants in the AP shall be **influenced** by AI. This is because, **whether AI is to more positively or more negatively impact AP, is highlighted to be solely in the hands of AP**. Thus, the TEA is quoted to be **indispensable** and **imperative** capabilities needed for accountants in order to **embrace** AI and **move with digital evolution**. **Currently AP is observed to be embracing technology including giving priority to AI adoption and implementation.** However, since it is a **profession-wide** and **organization-wide** initiative, AP is at the **beginning stage** of spreading **tech awareness**. These themes clearly show that the responses dictate how accountants should be having all the TEA and are using TEA as a **beginning** to embrace AI. So, based on using TEA to test the level of influence of AI on AP, it is clear how AP is to **enjoy a high level of significant positive opportunity creating influence** from AI rather than negative threat igniting influence as they are at the early stages of embracing AI. This shows how the roles of AP are to evolve and not be halted from evolving with digitalization.

The second question “how would you encourage Accountants to embrace AI? What is your advice or suggestions to the Accountants today” relate to obtaining advice or suggestions that can be shared with accounts today pertaining feasible and industrial-relevant techniques to embrace AI. This question is to examine if any of the 6 TEA chosen and mentioned by the researcher are quoted and also to ascertain other TEA factors. This can also be supportive to the quantitative Multiple Linear Regression analysis which revealed that the 6 TEA are able to test the level of influence of AI on DV by 21.8% and the remaining 78.2% of the level of influence of AI on DV can be tested by several other TEA factors.

The contextual coding analysis reveal that the interviewees highlight several suggestions which go back to the 6 TEA identified by the researcher in this study. However, there are 5 new **principles** suggested as **essential steps** to be more proactive in preparing for the digital world. **First**, accountants should be aware of the digital technology trends and access how the trends can affect their roles. **Second**, to introspect on the existing capabilities and build differentiated skills based on what digitalization demands, in order to fit into the change. **Third**, to harness and embrace digital technology. **Fourth**, to allocate digital reserves for funding the adoption and implementation of technology into organization. **Fifth**, to ensure the implementation adheres to good governance practices. **These themes clearly show** TEA is not only a **feasible** measurement tool and capabilities that bring AI closer to embracing AI, but a set of **industrial-relevant** techniques encourage to be adopted to embrace AI. However, it is **not the only set** of techniques, there are **other 5 techniques** identified that exist in the form of principles that can and should be adopted in **addition** to the 6 TEA to embrace AI completely.

The **third question** “*in your opinion, is AI likely to complement and alter the role of Accountants and the Accounting Profession or replace Accountants and the Accounting Profession*” relates to obtaining the view pertaining the impact on the role of accountant with the venture and influence of AI.

The contextual coding analysis reveal that the interviewees highlight that AI is likely to **complement and alter** the role of accountants rather than replace. However, the true nature of complementing is quoted as ‘**augmenting**’ the work of accountants. This is because of the **enabling effect** of AI that **enhances** the role of accountants. The accountants are to experience **enhanced job descriptions** with **roles changing** in the sense that, it is the **same role** but the **approach to execution is different** due to the **digital management** required with AI intervention. The concept of AI ‘**replacing**’ the accountants is **strongly rejected**, as **human senses** and **decision-making** is irreplaceable. The accountant’s **human mind** will still be **demanded**. The question is whether the AP has the **right supply** to the **demands**. These themes clearly show how **AI is to complement and alter the role of Accountants and the Accounting Profession and not replace Accountants and the Accounting Profession**.

The fourth question “*How long (in years) would it take for the waves of disruption led by AI to transform the Accounting Profession? If so, why*”? This question relates to ascertaining the approximate duration for the AP to experience the disruption led by AI. It is an additional area imperative to be ascertained in order to develop a complete understanding of the digital disruption phenomenon in AP.

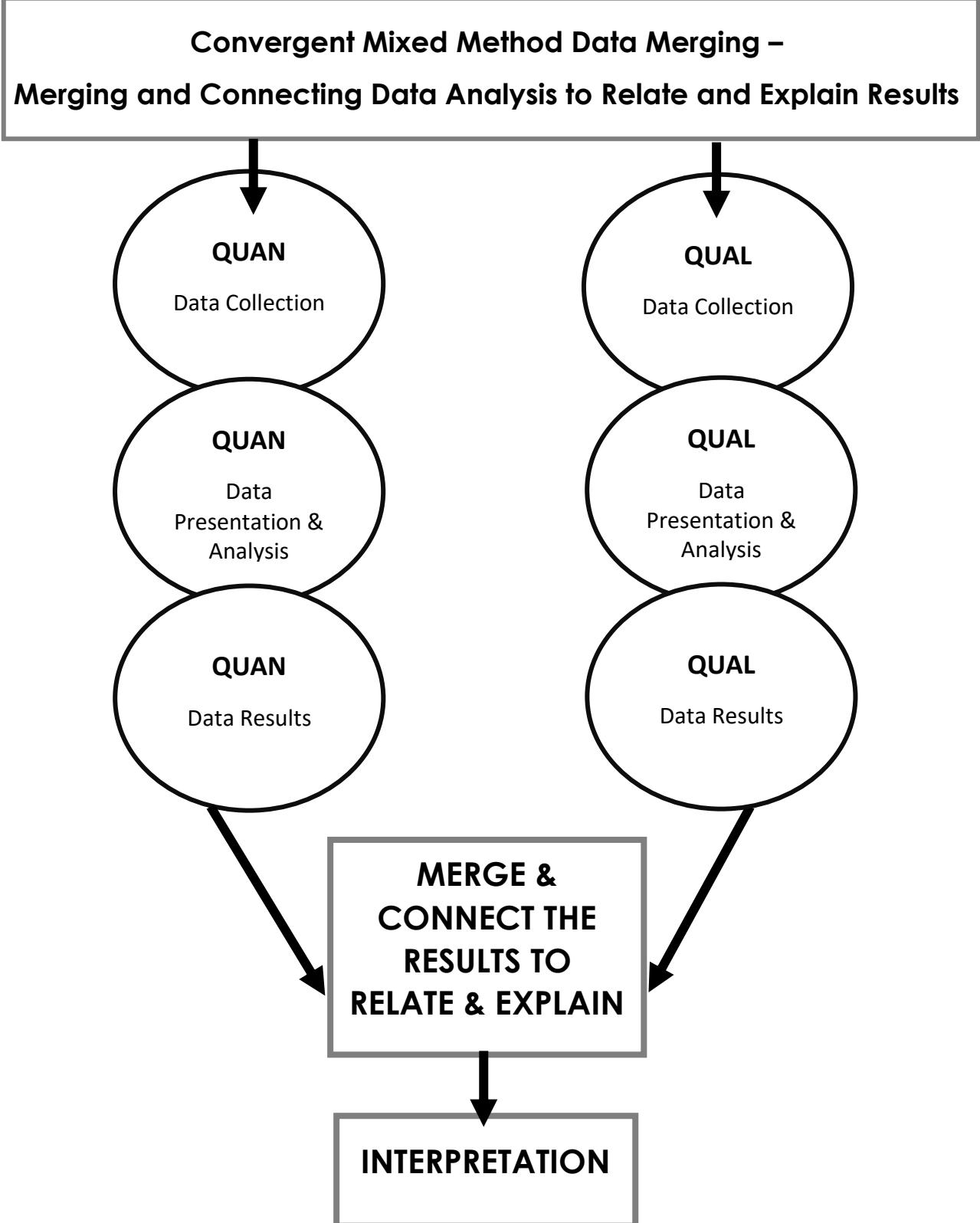
The contextual coding analysis reveal that the interviewees highlight the duration is **unpredictable** because it depends on the whole **ecosystem** and **global economy** as AP works in tandem with the **business community** as well as **sectorial growth**. But there is a **percentage increase year-on-year** in terms of **harnessing the transformation** as besides the transformation at big firms, **small firms**, like 3E have also begun embracing AI like ZERO (image recognition for invoices) for their process. Also, besides the **high-skilled** Accountants, the **low-skilled** Accounting technicians are also using **AI software** and tools to execute their work. Their work is **same**, but the **execution is different** – making it more **structured**. These themes clearly show how the disruption is **unpredictable**. However, there are some assumptions made by interviewees which shall be disclosed in the next section.

The fifth question “what is your view on the continuity of the Accounting Profession with the intervention of AI”? This question relates to obtaining the view pertaining impact on the continuity of AP.

The contextual coding analysis reveal that the interviewees highlight the AP to **live** for an **indefinite period** of time following the **enabling attribute** of AI. The profession is quoted to be an **abode of professionals** that carries **great responsibilities** and is going to be **demanded** for **assorted services** with the venture of AI. This would channel AP to **diversify** their **service portfolio**, especially at the **Big4 accounting firms**. This requires AP to have great **endurance** throughout the change that digitalization brings, because the interviewees emphasize that accountants are the **crafters of continuity** and digital **technology engenders** for those professionals that are **prepared** to embrace and adapt to changes. Since accountants are already **tapping** the **TEA** and moving towards **embracement**, their roles are **complemented** by AI and thus, the **sustainability** of AP has been quoted to stand at a **75% to 90%** chance of **longevity** – in other words a **strong continuity**. **These themes clearly show** that there is a positive impact on the continuity status of AP in terms of its longevity to be sustained.

MERGING OF THE QUANTITATIVE & QUALITATIVE DATA

Convergent Mixed Method
Notation: QUAN+QUAL



5.3: Point of Interface – Merging of the Data

MERGING OF THE QUANTITATIVE & QUALITATIVE DATA		
PARADIGM	Convergent Mixed Method Data Merging – Merging and Connecting Data Analysis to Relate and Explain Results.	
	Quantitative	Qualitative
Positive and Negative Relationship between AI and Evolving Role of Accountants in the AP	<p>1. Is there a significant relationship between AI as <i>Opportunity Creator</i> and AP?</p> <p>Positive Relationship Tests:</p> <p>Descriptive There is significant positive relationship between AI and AP via 6 “opportunity creating variables” with MEAN ranging from 3.91 to 4.36, and TOTAL MEAN 4.18/5.0.</p> <p><u>4.18=Opportunity Creator</u> <input checked="" type="checkbox"/></p> <p>Pearson Correlation 0.110=Positive Correlation 0.000 Sig.=Significant Correlation</p> <p>Linear Regression 0.571 R Value=Positive Relationship 0.326 R² Value= 32.6% IV to DV</p> <p>Linear Regression Anova 0.000 Sig.=Significant Correlation</p> <p><u>Pearson and Regression Findings=Opportunity Creator</u> <input checked="" type="checkbox"/></p>	<p>Positive Relationship Themes:</p> <ul style="list-style-type: none"> 1) Opportunity 2) Complement 3) Dual Impact 4) Enabler 5) Embracing Element 6) Key Success Factor 7) Ancient Convergence 8) Tech Necessity <p><u>1 to 8 = Opportunity Creator</u> <input checked="" type="checkbox"/></p>

Positive and Negative Relationship between AI and Evolving Role of Accountants in the AP	<p>2. Is there a significant relationship between AI as Threat Igniter and AP?</p>	
	<p>Negative Relationship Tests:</p> <p>Descriptive</p> <p>There is significant negative relationship between AI and AP via 6 “threat igniting variables” with MEAN ranging from 3.85 to 4.23, and TOTAL MEAN 4.06/5.0.</p> <p><u>4.06 = Threat Igniter</u> <input checked="" type="checkbox"/></p> <p>Pearson Correlation -0.263=Negative Correlation 0.000 Sig.=Significant Correlation</p> <p>Linear Regression -0.535 R Value = Negative Relationship 0.286 R² Value= 28.6% IV to DV</p> <p>Linear Regression Anova 0.000 Sig.=Significant Correlation</p> <p><u>Pearson and Regression Findings=Threat Igniter</u> <input checked="" type="checkbox"/></p>	<p>Negative Relationship Themes:</p> <ul style="list-style-type: none"> 1) Risk 2) Replace 3) Dual Impact 4) Destructor 5) Resisting Element 6) Key Failure Factor 7) Ancient Convergence 8) Tech Luxury <p><u>1 to 8 = Threat Igniter</u> <input checked="" type="checkbox"/></p>

<p>Significant Level of Positive and Negative Influence of AI on Evolving Role of Accountants in the AP</p> <p style="text-align: center;">↓</p>	<p>3. What is the significant level of influence of AI as <i>Opportunity Creator</i> and <i>Threat Igniter</i> on AP, based on the tech-embracing ability of Accountants?</p>	
	<p>Level of Influence Test via TEA Tech-Embracing Ability is: - Descriptive The 6 tech-embracing ability produced MEAN ranging from 3.64 to 4.2, with TOTAL MEAN of 3.69/5.0 – which shows that AI is to influence AP at high intensity of positive level of influence rather than adverse, threat-igniting influence.</p> <p>The MEAN for all 6 tech-embracing ability was above 3, showing all being agreed: -</p> <ul style="list-style-type: none"> 1) Strategic Vision 2) Flexibility 3) Culture of Change 4) Mindset Shift 5) Understanding 6) Sense of Urgency <p>3.69= High Level Positive Influence</p>	<p>Level of Influence Coding Results Tech-Embracing Ability is: -</p> <ul style="list-style-type: none"> 1) Indispensable 2) Uttermost Imperative 3) Crucial Ability 4) Enhancement Tool 5) Jewel of Adoption 6) Epitome of Evolution <p>In total, all the 6 Tech-embracing abilities were identified within the 9 interviews: -</p> <ul style="list-style-type: none"> 1) Strategic Vision 2) Flexibility 3) Culture of Change 4) Mindset Shift 5) Understanding 6) Sense of Urgency <p><u>1 to 6= Tech-Embracing Ability Recognized</u></p> <p><u>1 to 6 = High Level Positive Influence</u></p> <p>Pearson Correlation TEA>0=Positive Correlation TEA Sig.<0.05=Significant Correlation</p> <p>Linear Regression 0.467 R Value = Positive Relationship 0.218 R² Value= 21.8% TEA to DV</p> <p>Linear Regression Anova 0.000 Sig.=Significant Correlation</p> <p><u>Pearson and Regression Findings=High Level Positive Influence</u></p>

<p>Changing or Replacing?</p> 	<p>4. Is AI changing role or replacing role of Accountants and AP?</p>	
	<p>Changing or Replacing?</p> <p>80% of respondents that is 96 out of 120 respondents agreed AI will change and alter the role of Accountants and the AP.</p> <p>80% = Changing Role</p>	<p>Changing or Replacing?</p> <ul style="list-style-type: none"> 1) Complement and Alter 2) Augmenting 3) Enabling Effect 4) Role Upgrade 5) Aid to Solutions 6) Transform Routine Tasks <p>1 to 6 = Changing Role</p>
	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
<p>Continuity Sustained OR Halted?</p> 	<p>5. What is the continuity status of the AP?</p>	
	<p>Continuity Sustained OR Halted?</p> <p>The high strength of tech-embracing ability shows a high intensity of AI to positively influence AI, thereby changing and completing role of AP. This reveals that “continuity of AP is establish” in the advent of AI.</p> <p>3.69= High Level Positive Influence 80% = Changing Role 3.69 + 80% = Continuity Sustained</p>	<p>Continuity Sustained OR Halted?</p> <ul style="list-style-type: none"> 1) Foundational Role of AP 2) Enabling Attribute of AI 3) Professional Industry 4) Assorted Services Demanded 5) Endurance with Technology 6) Crafters of Continuity 7) Embracing Ability 8) Power of Human Brain <p>1 to 8 = Continuity Sustained</p>
	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

The convergent mixed method merging process show how the quantitative and qualitative data findings are ‘related’ and can be ‘connected’ to ‘explain’ the results. The data appears to ‘converge’ and be ‘related’ like ‘supportive’ for each other, and not ‘diverge’.

5.4 Solving the Research Problem



Based on **quantitatively** and **qualitatively** answering the **5 research questions** and strongly meeting the **5 research objectives**, the following paragraphs dictate how the articulations of **mixed method findings** solve the research problem. The **research problem** is addressed as a **theoretical gap** in the study which is bound to exist due to **educational issues**. The educational issues in this study revolve around **3 important dimensions**: -

Paradoxical Personality	 Positive and Negative Aspects of AI  Opportunities and Threats towards AP
Level of Influence	 Level of influence of AI on AP
Role and Continuity Status	 Changing or Replacing Accountants  Continuity Status of AP

Based on the quantitative and qualitative results that answered and met research question and objective 1 and 2, it clearly fills the gap by solving the first educational issue that is “*paradoxical personality*”.

Theoretically the **doctrine of paradoxical personality** has been **thoroughly** described by numerous **researchers** in several different **literatures** in terms of the **positive and negative aspects of AI** and the **opportunities and threats** created towards AP under the doctrine of digital disruption. However, there has been **no study** that have specifically identified, addressed and collected data to examine, verify, validate and demonstrate the **relationship** that appears to **exist between AI and AP** under the concept of **digital disruption**. The identification, articulation and supportive justification of the existence of this relationship is **imperative** to spread the necessary **understanding** and **awareness** to accountants especially in the advent of IR4.0 when digitalization appears to extend at unprecedented breadth and scale. *Thus, this study is carried out to bridge the gap by solving the issue of paradoxical personality.*

Based on the quantitative and supportive qualitative findings governed by research question and objective 1 and 2, it clearly **justifies** how the **6 opportunity creating variables** and **6 threat igniting variables**, that resemble the **primary determinants**, are able to weave a **positive and negative relationship** that is **significant** between **AI and AP**. In a holistic view, the both (dual) sides of AI that make up AI’s **paradoxical digital disrupting nature** that is specifically its ‘**opportunity Creating**’ and ‘**threat Igniting**’ dimensions are not only identified and addressed but verified, validated and justified with the support of primary data as to how it creates opportunities towards the evolving role of AP.

So, it solves the educational issue pertaining paradoxical personality in the sense that the **disruptive personality** of AI takes the **role of paradoxical personality**, by **creating opportunities and igniting threats**, simultaneously and that this happens **neutrally**, because it is a description of what is **happening** in the **environment**. Thus it shows how such a **technological revolutionary** is bringing **advancements in business and economic environment** through its opportunity creating attributes, but drastically **undermines ability to stay in business** through its threat igniting attributes. The **paradox** happens **concurrently**.

Based on the quantitative and qualitative results that answered and met research question and objective 3, it clearly fills the theoretical gap by solving the second educational issue that is “*level of influence*”.

Theoretically the **doctrine of paradoxical personality** has been **thoroughly** described by numerous **researchers** in several different **literatures** in terms of the **positive and negative aspects of AI** and the **opportunities and threats** created towards AP under the doctrine of **digital disruption**. However, there has been **no study** that showed interest in **investigating the level of influence** of AI on AP in terms of whether AI is to more positively or more negatively impact AP. Since there is no related study, there is also **no measurement** that has been **developed** to **measure the level of influence**. The investigation pertaining the level of influence is **imperative** to spread the **necessary understanding** and **awareness** to accountants especially in the advent of IR4.0 when digitalization appears to extend at unprecedented breadth and scale. *Thus, this study is carried out to bridge the gap by solving the issue of level of influence and also to develop an accurate yet sophisticated measurement that measure the level of influence.*

Based on the quantitative and supportive qualitative findings governed by research question and objective 3, it clearly communicates how the researcher have **developed** and **used the TEA (Tech-Embracing Abilities) measurement to measure the level of influence** of AI on AP. The TEA is a **set of 6 imperative capabilities** needed in the IR4.0 for **fostering tech-readiness** in order to embark on a **journey** towards **embracing AI**, or any technology. Due to the **limited scope** of the research, there are only **6 capability introduced**. However, there are numerous **other capabilities** that can be included under TEA. The TEA was chosen under the **ideology** that since digital disruption appears as an **uncertainty**, it is **inevitable** and how the AP is to be **influenced** solely **remains in the hands of the AP**.

Based on the TEA it clearly shows how AP shall experience a **high level of significant positive opportunity creating influence** from AI, rather than negative threat igniting influence, since **all the 6 TEA** have been **addressed** and **identified** by accountants – indicating their **strong readiness** towards **embracing digitalization** and AI.

So, it solves the educational issue pertaining level of influence, where the opportunity creating personality side is to have greater influence on role of AP.

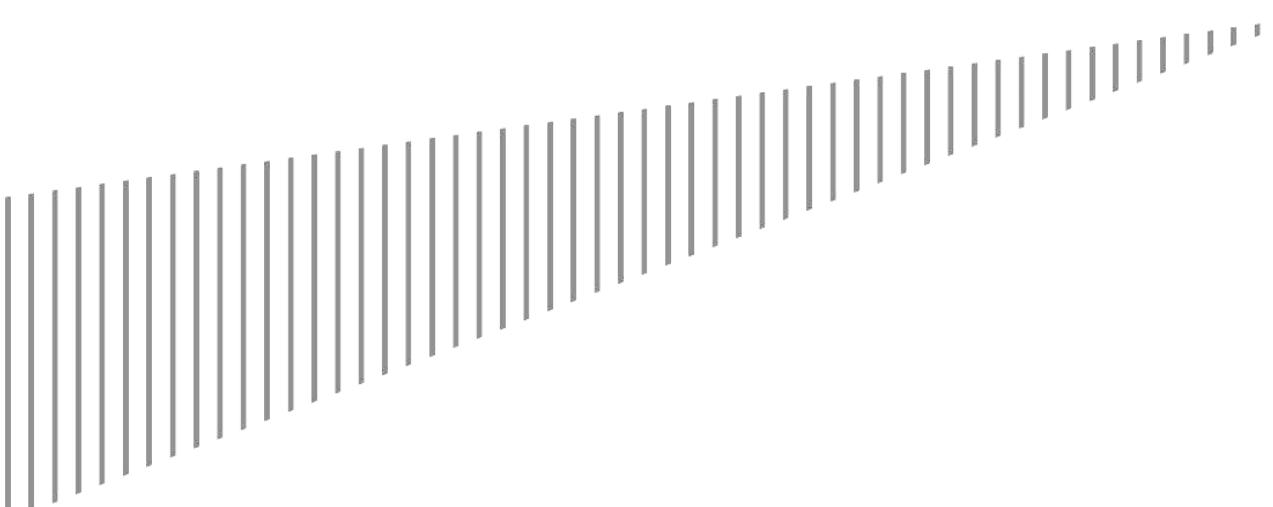
Based on the quantitative and qualitative results that answered and met research question and objective 4 and 5, it clearly fills the theoretical gap by solving the third educational issue that is “*role and continuity status*”.

Theoretically the **doctrine of paradoxical personality** has been thoroughly described by **numerous researchers** in several different **literatures** together with the **probable impacts** on the **role** of AP in terms of how it **changes** or gets **replaced**. However there is **no study** that **specifically justified** the **changing or replacing** of the **role based on how accountants perceive disruption**. Also, there is **no study** that **addressed** the **continuity status** of the AP **based on the changing or replacing role of accountants**. It is **imperative** to ascertain the **consequence of disruption** on the **role and continuity status** of the profession, as they are **depended on each other** (it can be seen how objective 4 is depended on 3 and objective 5 is dependent on 4). ***Thus, this study is carried out to bridge the gap by solving the issue of AP's role and continuity status.***

Based on the quantitative and supportive qualitative findings governed by research question and objective 4 and 5, it clearly shows that since the **findings for objective 3** were based on AP enjoying a **high level of significant positive opportunity creating influence from AI**, thus, it is evident for the reason behind AI is to **change** rather than replacing the **role of accountants**. This is because, it is only through **embracement** that one can enjoy **positive influence**; and it is only through positive influence that one can have AI **complement** their roles. And, since the **findings of objective 4** were based on AI to **change** rather than replacing the **role of accountants**, it is evident for the reason behind the **continuity of AP to be established**. This is because, it is only through change and **moving with change** that the accountants can enjoy its profession to **sustain**, if not the **longevity** can be **easily halted**.

So, it solves the educational issue pertaining role and continuity status, where since accountants are using the TEA in embracing AI and ensuring their roles to change and not to be replaced, there is a positive impact on the continuity status of AP in terms of its longevity to be sustained.

It can be seen how the research questions provided a strategy to meet the research objectives. Upon meeting each research objective quantitatively and qualitatively, it solved all the educational issues. This filled the research gap thereby solving all research problems.



CHAPTER 6

CONCLUSION &

RECOMMENDATION

DOCUMENT FLOW

For this Section Only

6.0 Introduction

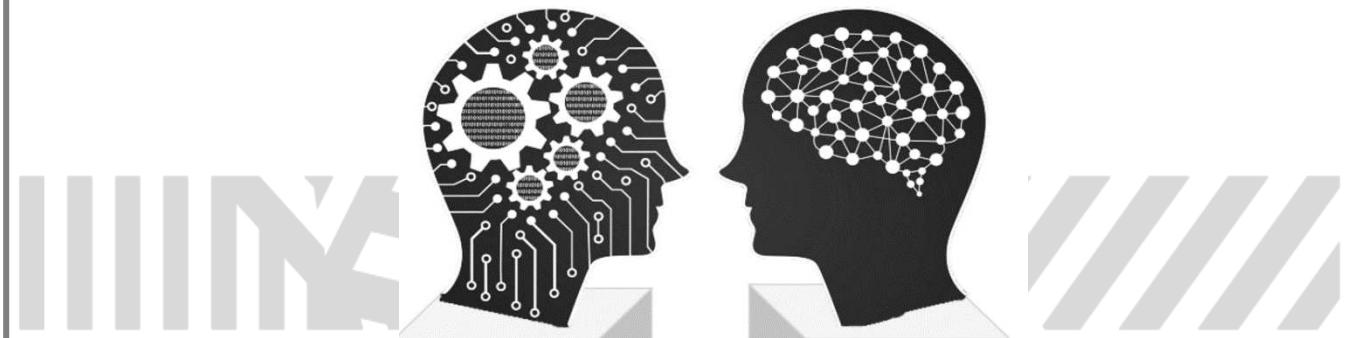
6.1 Research Purpose Evaluation

6.2 Recommendation

6.3 Limitation

6.4 Further Research

6.5 The Final Note



6.0 Introduction

This chapter involves the process of introspecting upon the results and findings of the study in order to clarify the feasibility of the results and findings towards the research objectives. This is because, it is only through introspection that one will truly realize the limitations experienced and be motivated to convert them into genuine suggestions that can be given to the world, so that further studies can be carried out in combating the limitations. This chapter also provides the opportunity for the author to present the final say in order to weave the ending threads of the research appropriately and not abruptly.

6.1 Research Purpose Evaluation

This evaluation relates to re-visiting and contemplating further regarding the significance of the findings towards the research purpose. Since this research adopted the convergent mixed method design, the merged results and subsequent findings of the quantitative and qualitative data were used for further interpretation that involved relating and connecting the results and findings towards settling hypothesis, answering research questions, meeting research objectives and finally solving the research problem.

In line with objective 1, it clearly shows how AI as a digital disruptor carries the potential to create opportunities that positively fuel the evolving roles of accountants in the AP. Thus, it is evident how AI and AP share a positive relationship that is significant enough to motivate the accountants towards harnessing AI. This fills the research gap pertaining paradoxical nature of AI.

In line with objective 2, it clearly shows how AI as a digital disruptor carries the potential to ignite threats via its drawbacks that halts the roles of accountants from evolving. Thus, it is evident how AI and AP share a negative relationship that is significant enough to influence the accountants towards resisting the adoption and implementation of AI. This fills the research gap pertaining paradoxical nature of AI.

In line with objective 3, it clearly shows based on the inclining adoption of tech-embracing abilities that the accountants in the AP are to enjoy a positive opportunity creating influence from AI, rather than negative threat igniting influence. This fills the research gap pertaining the level of influence of AI on AP.

In line with objective 4, it clearly shows that, since AP is to experience a significant positive influence from AI, their roles are to be complemented rather than replaced by AI. This is because it is the point in the evolution of AP where accountants are to work side-by-side and hand-in-hand with AI. This fills the research gap pertaining the changing or replacing dilemma amongst accountants.

In line with objective 5, it clearly shows that, since AP is to experience a significant positive influence from AI and their roles to be complemented by AI, hence having the continuity of the profession established. This fills the research gap pertaining the going concern status of the Ap.

Based on following the doctrine and standards of convergent mixed methods, the results and subsequent findings, via extensive interpretation, manage to strongly settle hypothesis, answer research questions, meet research objectives and solve all the research problems.

The relevance of the research findings towards the research objectives can be said to have strongly fulfilled the ultimate aim of convergent mixed method that is to provide a complete understanding of the phenomenon of Artificial Intelligence as a Paradoxical Digital Disruptor in the Accounting Profession.

6.2 Recommendation

The AP is an abode of professionals that is expected to demonstrate an enthusiastic response towards the evolving smart and digital technology; continued globalization of reporting and disclosure standards; and the new forms of regulations that come with AI. This is because AP has always been a profession that aims to radically improve the quality of business and investment decisions. In order to realize this potential, the profession needs to focus on fundamental business problems it plans to solve and ponder upon how technologies like AI can augment their approaches. The following paragraphs dictate a six-step recommendation for the accountants and the AP as a whole in channeling their prerogative towards achieving digital success, which is mainly obtaining a balance between disruption and business.

First, **digital strategy mapping** – involves identifying, formulating and implementing strategic plan that guides every decision-making to include introspection on how technology could improve the decision-making. This is imperative as it does not only test but enhance the digital maturity of the profession – thereby improving digital capability development.

Second, **pilot project creation** – involves in assigning projects for prototype to help accountants and the AP learn what works best in solving business problems.

Third, **harnessing right capabilities** – features the lessons learned from prototype process in prioritizing the tech-capabilities needed for organization, people, process and technology.

Fourth, **becoming a data virtuoso** – highlights that AP is a data intensive profession, hence is expected to have the ability to identify and gather the right data, deploy it for the right purpose and effectively analyze it. This can be done by focusing on predictive analytics and forecasting, prescriptive analytics, business driven decision-making and automated feedback to the organization.

Fifth, **digital enterprise development** – emphasize on the endurance to transform towards the right digital culture that retain talent, demonstrate clear leadership, commitment and vision of finding balance between disruption and business.

Artificial Intelligence as a Paradoxical Digital Disruptor in the Accounting Profession.

Sixth, **ecosystem planning** – highlights that since disruption is an ecosystem phenomenon, instead of focusing on horizontal and vertical integration within organization, the AP should look into understanding client needs and use digital technologies to create and deliver value to client in an integrated, innovative way.

This six-step framework can be supported with an innovation acceleration framework.

Design



- Bottom-up driven process
- Bottom-up submissions from staff

Discover



- Central innovation team to set out new ideas
- Leadership aggregates submissions and priorities them based on potential
- Leadership decides on top ideas with input from specialists and advise
- Top ideas are selected for development based on potential and alignment with organisational objectives

Develop



- Central incubation team established to develop and nurture new capabilities
- For ideas submitted, develop and incubate identified solutions using the core central innovation team
- Utilise appropriate SME “team” and resources as required
- Identified skills/technology/partnerships required to implement
- Develop capabilities rolled out for the organisation



- implementation plans
- Lead implementation of new services and capabilities

Implement



- Develop roll-out plans to relevant business units including finance team
- Pilot where necessary and build on success
- Use innovation and talent development progress against objective

Monitor



- Report on results and provide feedback on what is working well/ or not working well for the service offerings so it can be disseminated to other business units
- Track progress and re-evaluate priorities based on experience

Artificial Intelligence as a Paradoxical Digital Disruptor in the Accounting Profession.

The world is changing and the digital revolution will only increase in pace. It is vital for the profession to stay relevant and evolve as well. The only way to do this effectively is to continue to develop new capabilities.

This six-steps for digital success includes practical steps that any accountant or organization can adopt. It is important that this is supported by the right supportive culture and an innovation acceleration process to promote the development of new ideas. Although the steps required may seem daunting at first, it is only by embracing this “digital wave” that the profession can ensure it plays an even bigger and more relevant role in future.

6.3 Limitations

This study is carried out in a way that strives to provide a holistic view of the phenomenon being studied. Regardless, there are 3 major limitations that appear to limit the completeness of the study.

Disruption – the doctrine of disruption appears to feature the concept of paradox as the primary element to describe the true nature of disruption. This is because disruption is a description of what is happening in the environment and is observed to bring opportunities and risk, at somewhat neutrally. This reality is often misunderstood by people, especially the accountants, as the term ‘disruption’ is often perceived to carry the same meaning as ‘destruction’. This is a severe misconception that could lead readers misinterpret this research study. This is because, ‘destruction’ may only refer to 50% of what ‘disruption’ is and thus, it is imperative to understand the right synonym to ‘disruption’ is ‘transformation’.

Sampling – the study has adopted convergent mixed method design that requires population sample size for quantitative and qualitative data collection, respectively. Technically the sample sizes are required to be of the same size, but this study has adopted larger quantitative sample size and smaller qualitative sample size, which is not against the doctrine of convergent mixed method as it is collected for different purposes (generalization and in-depth description, respectively). Regardless, it appears to be a limitation because the research findings could include better statistics and broader description of the topic studied, if larger sample size is used, preferably same size for both quantitative and qualitative data collection – in order to maximize the benefits of convergent mixed method.

TEA and the Level of Influence Measurement – the ‘tech-embracing abilities’ appear to be the only measurement to measure the level of influence of technology on AP. Due to limited amount of time, this research did not develop more measurements. Thus, it is a limitation, as more measurement can be developed and used to get more accurate results pertaining the level of influence. This limitation is extended in the sense that only 6 TEA were identified and used to measure the level of influence. There are numerous other capabilities that could have been included under TEA to have the level of influence measured in a more holistic view.

6.4 Further Research

The limitations of this research is what demands the need for further research. There are 3 major areas in which a further study should be carried out to combat the limitations of this research.

Disruption – in the advent of IR4.0, the theory of disruption is applied to technology. This is something that requires further articulations to ensure the ‘description of technology as a disruptor’ can be conveyed and communicated to any individual without creating confusion. This would mean to carry out more studies associating digital disruption with different technologies, and not just AI. It is only then, the theory of digital disruption would prove to be feasible in the context of IR4.0, and that, it is a ‘transformational force’ rather than a ‘destructive force’.

Evolving Role of Accountants in the Accounting Profession – since it is the advent of technology evolution, the roles of accountants are also expected to evolve due to the significant collaboration between AP and technology. Thus, the manner in which the roles shall evolve could be identified and addressed more extensively to provide a more complete understanding on how technology is to impact the roles directly.

TEA - It is evident how ‘tech-embracing abilities’ are important for accountants to maximize the transformational opportunity technology has to provide. This demands for further research in terms of how the TEA influences the accountant’s black box to ensure that accountants move towards harnessing technology. And also, to extensively determine the feasibility of TEA in the era of digital disruption – thereby to relate the TEA, accountant’s black box and the ecosystem of digital disruption.

6.5 The Final Note

The title “Artificial Intelligence as a Paradoxical Digital Disruptor in the Accounting Profession” definitely tickles the mind to show interest pertaining the reason behind the selection of these particular set of terminologies, and not some other. It also makes one wonder the possible relationship between the terminologies.

This is the uniqueness of this research that is interested in drawing the attention of professionals out there, in order to have their journey towards the world of digital ecosystem, begin via this research, if not anywhere else.

It is directed to all professionals, but accountants more specifically, because accountants play a big role in digital transformation. This is why, this research is an addition to the efforts taken by the International Federation of Accountants (IFAC), the global leader of the accountancy profession which has put forward a global call to all accountants worldwide to respond appropriately to technology. It is also an extension to the efforts taken by MIA in guiding accountants to develop action plans that are appropriate to the environment.

The author of this research study weaves the ending threads of this research by presenting a quote articulated by the president of IFAC.

“ Technology is to burnish the Accounting Profession’s credentials as a trusted advisor. Hence, it is indispensable for the profession to continue to adopt and implement emerging technologies or otherwise be left on the sidelines. ”

Rachel Grimes

President of the International Federation of Accountants

You have just
Begun your
Journey
towards the
World of Digital
Ecosystem



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APPENDIX

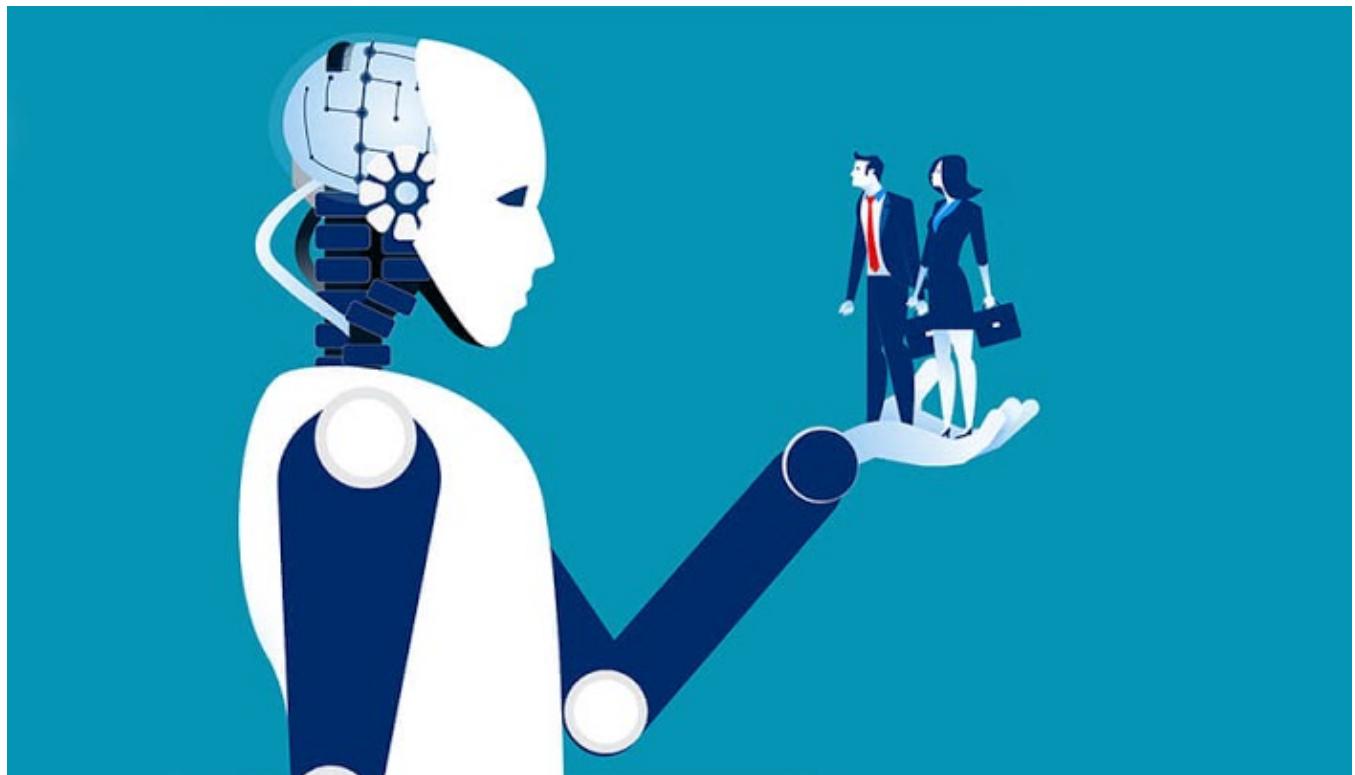
QUESTIONNAIRE SAMPLE

Artificial Intelligence as a Paradoxical Digital Disruptor in the Accounting Profession.

Dear Accountants,

I am Harisai, a final year student pursing BA (Hons) in Accounting and Finance at Asia Pacific University of Technology and Innovation (APU). This research is part of a dissertation, intended to fulfil requirements pertaining degree completion at APU.

You are about to enter the world of Artificial Intelligence. Are you Ready?



MUST READ

The research is a study on Artificial Intelligence (AI) as Paradoxical Digital Disruptor in the Accounting Profession (AP) – which ardently investigates how AI disruptively impacts AP at a paradox of creating opportunities but igniting threats, simultaneously. This is when, AI is observed to complement or replace the profession – leaving the longevity of profession questionable. To bridge this research gap, the researcher decides to ascertain the level of positive and negative influence of AI on AP based on the tech embracing ability of accountants to reveal the longevity status of the profession. Thus, the following questions have been crafted sophisticatedly, to give this research an authentic and solid stance.

NOTE: This research is solely for academic purposes. All responses shall be kept under high confidentiality, and shall not be disclosed to any third party.

NOTE: Please uplift the highest form of integrity, for it shall contribute to new knowledge in this research area.

Do you know what is AI?

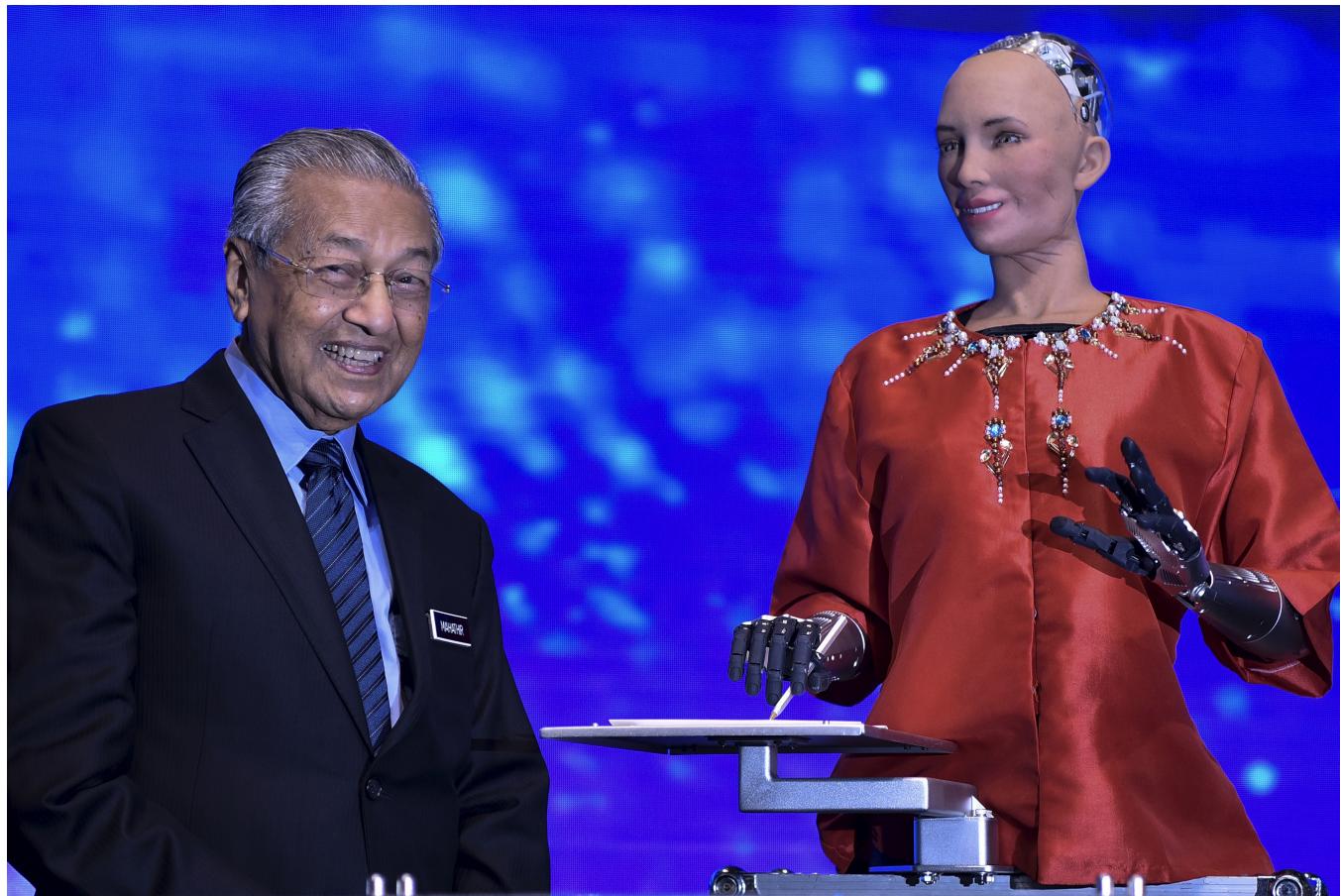
Artificial Intelligence (AI) refers to technologies that make machines 'smart' - whereby fostering the ability of machines to study human-like intelligence and exhibit human-like capabilities in areas such as thinking, understanding, reasoning, learning and perception. It is also often referred to as including the ability of the machine to make decisions on the basis of these processes.

*ABBREVIATION IN USE

AI - Artificial Intelligence

AP - Accounting Profession

MALAYSIA TODAY: Malaysia Chats with World's First Humanoid Robot Sophia



General Information

Instruction: Please select the most appropriate answer.

Gender *

Male

Female

Age *

- Below 25
- 26-35
- 36-45
- Above 45

Highest Accountancy Qualification *

- Bachelor's Degree
- Professional Qualification
- Master's Degree
- PhD

Years of Working Experience *

- 3 years and below
- Between 3 to 6 years
- Between 6 to 9 years
- 10 years and above

Job Status *

- Employed
- Top Management
- Middle Management
- Non-Managerial
- Self-Employed

Current Designation *

(Example: Audit Senior/Finance Manager/Consultant)

- Accounts Assistant
- Senior Finance Accountant
- Accounts Executive
- Accounting Manager
- Audit Senior
- Risk Advisory
- Finance Consultant
- Finance Officer
- Tax Accountant
- Internal Auditor
- Forensic Accountant
- Other:

Sector/Industry *

- Commerce and Industry
 - Public Practice
 - Public Sector
 - Academia
-
-

The Evolving Role of Accountants in the Accounting Profession

This section investigates the current condition of the Accounting Profession in the context of digital disruption. Kindly choose the most appropriate answer.

The AP is at the position of experiencing a cycle of evolution empowered by digitization. *

1 2 3 4 5

Strongly Disagree Strongly Agree

The AP stands at an opportunity to be complemented, but at risk of being replaced by AI. *

1 2 3 4 5

Strongly Disagree Strongly Agree

If Accountants are to embrace AI, they are likely to enjoy a positive impact on their roles, if not, vice versa. *

	1	2	3	4	5	
Strongly Disagree	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	Strongly Agree

It is a common psychology for Accountants to fear and resist AI in the beginning than to embrace it. *

	1	2	3	4	5	
Strongly Disagree	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	Strongly Agree

Artificial Intelligence Creating Opportunities - The 6 Factors

This section investigates how AI creates opportunity in the Accounting Profession. Kindly choose the most appropriate answer based on your understanding and experience.

AI can most support the work of Accountants by helping to achieve time and cost reduction, increased productivity and improved accuracy. *

	1	2	3	4	5	
Strongly Disagree	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	Strongly Agree

AI aid accountants, especially to do what accountants cannot accurately and precisely do. *

	1	2	3	4	5	
Strongly Disagree	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	Strongly Agree

1. DECISION SUPPORT



The idea of AI replicating human reasoning to help you make better inference-based decisions is a good thing. *



The idea of AI assisting you in ensuring technical decision making is free from biasness is a good thing. *



2. INTERACTIVE LEARNING & TEACHING



I like working in an environment where: - AI completes monotonous and time consuming task for me – like journal entry validation. *



I like working in an environment where: - AI identifies errors in my work, teaches me corrective action and trains me on particular subject matter. *



3. INTELLECTUAL CAPITAL & EXPERTISE STORING



AI helps preserve secret tactics developed by my team for future projects. This is a positive aspect towards faster and better quality work. *



4. DIGITAL MANAGEMENT



AI gives me opportunity to improve my tech-skills; thereby elevating my ability to work hand-in-hand with AI. *



Working with AI, accountants would be collaborators of technology rather than passive users of software. *



5. DATA PROLIFERATION



With AI being able to read through large volumes of text in short time, it not only saves time but helps concentrate on other important decision making areas. *



With AI increasing understandably of information, it promotes transparency in financial reporting - thereby allowing Accountants and shareholders make better decisions. *

1	2	3	4	5	
Strongly Disagree	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	Strongly Agree

6. CONSISTENCY & ERROR REDUCTION

With AI ensuring same depreciation method is used yearly, it helps comparability of financial results and fosters better decision making. *

1	2	3	4	5	
Strongly Disagree	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	Strongly Agree

Since AI is a machine, it escapes tiredness, boredomness and biasness. This would reduce human error and chances of high material misstatements. *

1	2	3	4	5	
Strongly Disagree	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	Strongly Agree

Artificial Intelligence Igniting Threats - The 6 Factors

This sections investigates how AI ignites threats in the Accounting Profession. Kindly choose the most appropriate answer based on your understanding and experience.

With AI replacing jobs that accountants do, it threatens accountant's ability to stay in business. *

	1	2	3	4	5	
Strongly Disagree	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	Strongly Agree

The limitations of AI restrict accountants to benefit from its transformational opportunities. *

	1	2	3	4	5	
Strongly Disagree	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	Strongly Agree

1. EXCEPTIONAL PROFICIENCY



AI performs accounting tasks proficiently and effortlessly. This has high potential of increasing redundancy. *

	1	2	3	4	5	
Strongly Disagree	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	Strongly Agree

In the near future, accountants may face difficulty getting employed if they omit to have necessary tech-skills. *

	1	2	3	4	5	
Strongly Disagree	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	Strongly Agree

2. DATA SPECIFICATION



Quantity and quality of data programmed into AI is important in order for AI to lead accountants make right decisions. *

1 2 3 4 5

Strongly Disagree Strongly Agree

AI may grant similar solutions to different problems. If accountants omit to check its relevance, the accounting work will lack significance. *

1 2 3 4 5

Strongly Disagree Strongly Agree

3. IMPLEMENTATION COST

Implementation of customized AI in different Accounting area may require additional funding that firms may have not budgeted before. *

1 2 3 4 5

Strongly Disagree Strongly Agree

Dealing with AI requires Accountants to obtain training pertaining AI-management. This is additional cost for companies.

1 2 3 4 5

Strongly Disagree Strongly Agree

If companies do not begin allocating reserves for digital funding, they are at great risk.



4. PROGRAMMING MALFUNCTION

The Accountants are at great risk when AI-system malfunctions and data cannot be retrieved. *



5. COMPLICATED ALGORITHMS

I would reject using AI if I have no clue how to explain the results derived by AI. *



I would reject using AI if I cannot rely on data processed by AI. *



6. MISCONCEPTION

AI confuses accountant whether to probe, question and challenge 'ethical' facets or follow so called 'accurate' results of AI. *

1	2	3	4	5	
Strongly Disagree	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	Strongly Agree

As an Accountant, I would reject using AI if decisions suggested by it compromise my ethical independence. *

1	2	3	4	5	
Strongly Disagree	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	Strongly Agree

Tech Embracing Ability of Accountants - Are You Ready for AI?

This section investigates the level of influence of AI on AP based on the tech embracing ability of Accountants. Kindly choose the most appropriate answer based on your understanding and experience.

As an Accountant, to which extent do you agree to with the following in embracing AI. I am ready to: -

Plan, formulate and implement a sophisticated strategy specifically to address digitization and the intervention of AI into my company. *

Embracing Ability: Strategic Vision for implementing AI

1	2	3	4	5	
Strongly Disagree	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	Strongly Agree

Be flexible to move with the changes AI brings. *

Embracing Ability: Flexibility

**Move out of my comfort zone and dwell in an innovative culture of change.**

*

Embracing Ability: Culture of Change

**Disrupt, redefine business strategy and establish an agile and experimental mindset in adopting AI. ***

Embracing Ability: Mindset Shift

**Make an effort to understand digitization and disruption led by AI. ***

Embracing Ability: Understanding of AI

**Understand, learn and adopt AI urgently. ***

Embracing Ability: Sense of Urgency in Adopting AI



Rank the Most Important Embracing Ability

Which is the most important ability needed for successfully embracing AI as a digital technology? *

Only choose one option

- Strategic Vision for implementing AI
- Flexibility
- Culture of Change
- Mindset Shift
- Understanding of AI
- Sense of Urgency in Adopting AI

AI will Change or Replace Accounting Profession?

In my opinion, I think AI will *

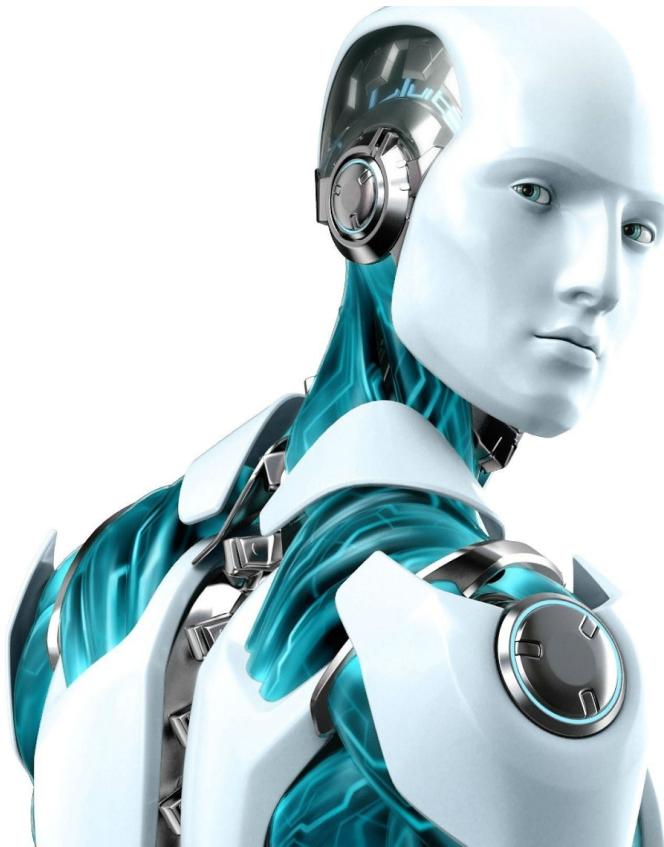
Only choose one option

- Change and Alter the Role of Accountants and the Profession
- Completely Replace Accountants and the Profession

In my opinion, this disruption (transformation) will happen in *

Only choose one option

- 3 years and below
- Between 3 to 6 years
- Between 6 to 9 years
- 10 years and above



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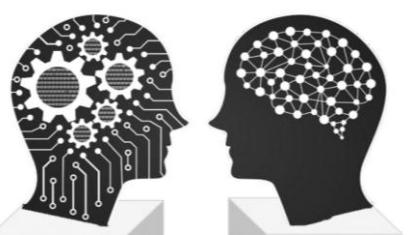
INTERVIEW QUESTION SAMPLE

Artificial Intelligence as a Paradoxical Digital Disruptor in the Accounting Profession.

SETTING THE TONE

The responses derived from this interview shall contribute to the research featuring a study on Artificial Intelligence (AI) as Paradoxical Digital Disruptor in the Accounting Profession (AP) – which ardently investigates how AI disruptively impacts AP at a paradox of creating opportunities but igniting threats, simultaneously. This is when, AI is observed to complement or replace the profession – leaving the longevity of profession questionable. To bridge this research gap, the researcher decides to ascertain the level of positive and negative influence of AI on AP based on the tech-embracing ability of accountants to reveal the longevity status of the profession. Thus, the following questions have been crafted sophisticatedly, to give this research an authentic and solid stance.

NOTE: This research is solely for academic purposes. All responses shall be kept under high confidentiality, and shall not be disclosed to any third party.



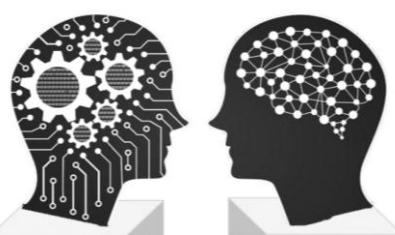
Artificial Intelligence as a Paradoxical Digital Disruptor in the Accounting Profession.

- INTERVIEW QUESTIONS -

*Abbreviation in Use: Artificial Intelligence (AI)

1. What is your view regarding the Accounting Profession's collaboration with technology?
2. How would you describe Disruption in the Accounting Profession?
3. What is your view on the opportunities created and threats ignited by AI? Should Accountants embrace it or fear from it?
4. The level of positive or negative influence of AI on Accounting Profession is likely to be decided based on the 'tech-embracing ability' of Accountants. (This means, if they embrace, they are likely to enjoy a positive impact, and if not, vice versa). How importantly do you view this?
5. How would you encourage Accountants to embrace AI? What is your advice or suggestion to the Accountants today?
6. In your opinion, is AI likely to complement and alter the role of Accountants and the Accounting Profession or replace Accountants and the Accounting Profession? If so, why?
7. How long (in years) would it take for the waves of disruption led by AI to transform the Accounting Profession? If so, why?
8. What is your view on the continuity of the Accounting Profession with the intervention of AI?

Interviewer: Harisai Doshi

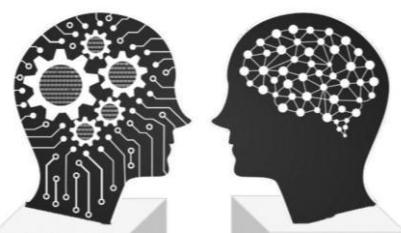


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Artificial Intelligence as a Paradoxical Digital Disruptor in the Accounting Profession.

- INTERVIEW QUESTIONS -

*Abbreviation in Use: Artificial Intelligence (AI)

1. What is your view regarding the Accounting Profession's collaboration with technology?

Technology is something that has **grown** over the past years and the use of it is increasing in many other services. It is no longer just used for the purpose of IT development, but for many **other services** which can be enhanced with the use of technology. **Accounting** is one of them. This is mentioned in the article entitled 'Disruption in Accounting and Finance – From Book-keeping to Strategizing' written by me (the respondent Ms. Meera) and published on **Leaderonomics**' e-magazine in June 2019, where **Accounting** is purely an information system, and Accountants run the role of providing information to stakeholders. This information is very crucial and demand a thorough level of understanding for its accuracy. This is when technology steps in to improve accuracy of information. Specifically, referring to AI, it automates process and makes information readily available in quick manner. It takes away many redundant roles and converts them into more strategic areas.

2. How would you describe Disruption in the Accounting Profession?

The term disruption does implicate something **negative** at a first look, but upon pondering towards its true nature, it is something that is very much **needed** in the world today, and specifically in the AP. This is because without disruption, the AP will not be utilizing the **change** and **move with time**, and eventually not step into the evolution. The act of standing still is what makes disruption to be a **threatening agent**, but taking a step forward towards the change would push you at an **advantage**. In Accounting, disruption is an **enabler** and a **destructer**, but definitely more of an enabler because the AP is interested to use technology in providing sophisticated solutions for business issues. The idea is, as long as one understands the use and benefits of technology, then technology shall not cause anything negative towards the profession.

3. What is your view on the opportunities created and threats ignited by AI? Should Accountants embrace it or fear from it?

Accountants today should not fear, because fear will not get them anywhere, rather leave **laidback**. Thus, the option is towards embracing it. However, there is a dilemma pertaining how to **embrace technology**, in the sense that, how to ensure we use it in most **cost efficient** manner and at **maximum capacity**. This is the point Accountants must convert technology as an opportunity and look at it in a **strategic vision** for building it as an organization wide strategy, to further the business, to create more **strategic roles** for Accountants, catering a better work life balance and most importantly to grow the profession into providing more services.

4. The level of positive or negative influence of AI on Accounting Profession is likely to be decided based on the ‘tech-embracing ability’ of Accountants. (This means, if they embrace, they are likely to enjoy a positive impact, and if not, vice versa). How importantly do you view this?

The key element in the AP’s ecosystem is ‘**timing**’. Currently, the AP faces a lot of **positive embracement**, especially from the **Big4** who are ardently working in the idea of how to uplift the entire role of the profession using technology. This **initiatives** are **bringing awareness** to Accountants, as they want to reach out to profession-wide. Thus, at this moment, AP is at the ‘**awareness stage**’, but it is occurring gradually, because the AP is being impacted by the **negative-side** of technology at the very same time, and they have to **convert the negative influence into positive** to ensure it does not get stronger (it should not), because if it does, then AP will fall back and be at disadvantage. This would give **opportunities to other professions** to take on roles of Accountants, since they have managed to get hold of the positive impact of technology. This is when the tech embracing ability of Accountants is **imperative** and **crucial** for the **advancement** of the **profession**.

5. How would you encourage Accountants to embrace AI? What is your advice or suggestion to the Accountants today?

The regulators play a key role, for example MIA which have been bridging the gap caused by the **growing disconnection** between **technology adoption** and the **magnitude of understanding the transformational opportunities** that it potentially provides. Thus, MIA has produced the Digital Technology Blueprint to help Accountants and the AP to ‘move’ with the digital evolution. Subsequently, to encourage Accountants towards embracing AI, it begins with the **top management** in creating the **awareness and understanding**. It should be a **top-down approach**, and the similar aspect should be seen in the **bottom-up** where they should be ready to follow the **change implemented** by **strong acceptance**. This refers to SMEs who make up large percentage of our economy and revenue, and with their acceptance itself, it could take the AP far with technology.

6. In your opinion, is AI likely to complement and alter the role of Accountants and the Accounting Profession or replace Accountants and the Accounting Profession? If so, why?

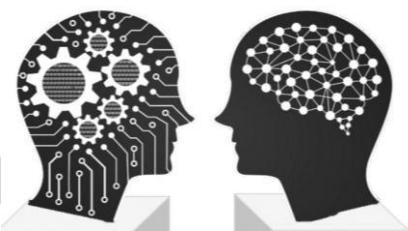
AI is a **complement** to the AP because it will **create more job opportunities**. It will **replace** the roles in the sense that the **change from one role to another** makes the previous role to be vanished. This does not mean one will be out of job, instead your **job description** has been **enhanced** and **upgraded** to work with the **new technology** in pursuance of **completing** the same function. Thus, the ideology of ‘**replacement**’ ignites at the switch from one role to another, as it may be a **drastic modification**. Thus, if critically analyzed, it is changing the role, and not replacing the role, because it is the same role, but the **execution has become different**. This is when the adoption can be implied as ‘choosing what is vital’ to ease the way Accountants work, because Accountants value their work by putting a benchmark of price and if not with technology, the Accountants will not enjoy an improvement on productivity, effectiveness and efficiency. Also, thinking based on an ‘Accountant-Client’ scenario, the help of technology will make the Accountant’s input to increase the productivity of their clients. So, Accountants shall using their strength of their levy to transform other parts of organization, thereby benefiting the ecosystem as a whole.

7. How long (in years) would it take for the waves of disruption led by AI to transform the Accounting Profession? If so, why?

AI would transform within **approximately 5 to 10 years**. However, the changes will be on a staggered form, rather than at one instance.

8. What is your view on the continuity of the Accounting Profession with the intervention of AI?

There will be **sustainability** towards the profession. It is imperative to understand that Accounting is a **profession of professionals** – with Accountants holding the professional status and having the **authority** to **sign** on financial statements. The **responsibility and accountability** is very **much higher** than many other professions other there. The AP can be **equated** with Lawyers and Doctors, thus having great liability. Thus, the intervention of AI will definitely bring about **continuity and sustainability** – in the idea of having AI helping us venture into new businesses and new services. For example, clients may **demand certain services** which Big4 may not be providing, but with AI, it enables the accounting **firms to cater for assorted services** on demand. Therefore, the continuity stands at a **75% to 90% chance of longevity** – in other words a **strong continuity**.

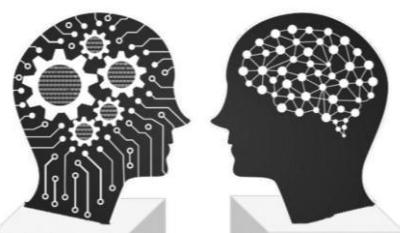


Artificial Intelligence as a Paradoxical Digital Disruptor in the Accounting Profession.

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The responses derived from this interview shall contribute to the research featuring a study on Artificial Intelligence (AI) as Paradoxical Digital Disruptor in the Accounting Profession (AP) – which ardently investigates how AI disruptively impacts AP at a paradox of creating opportunities but igniting threats, simultaneously. This is when, AI is observed to complement or replace the profession – leaving the longevity of profession questionable. To bridge this research gap, the researcher decides to ascertain the level of positive and negative influence of AI on AP based on the tech-embracing ability of accountants to reveal the longevity status of the profession. Thus, the following questions have been crafted sophisticatedly, to give this research an authentic and solid stance.

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Artificial Intelligence as a Paradoxical Digital Disruptor in the Accounting Profession.

- INTERVIEW QUESTIONS -

*Abbreviation in Use: Artificial Intelligence (AI)

1. What is your view regarding the Accounting Profession's collaboration with technology?

The Malaysian Institute of Accountants (MIA) have been taking **innumerable initiatives** in channeling technology into the AP. Thus, where the Profession is concerned, it has always been boosted to use technology in improving effectiveness and efficiency. However, most recently, in the advent of fourth industrial revolution, MIA officially released the **MIA Digital Technology Blueprint 2018** which specifically features in preparing the Malaysian Accountancy Profession for the Digital World, by positioning **technology as a strategic agenda**. The blueprint talks about how technology is impacting the AP in different ways.

The starting point, pertaining the collaboration of accounting and technology, begins with being **clear** regarding the **technologies** available around us as not all technologies are important for AP. But there are few technologies that emerge to be more important than the others. The first in rank is, **Data Analytics** and using **AI for Analytics**. Data Analytics is imperative for Accountants because Accountants handle huge volumes of financial data and some are non-financial data which relates to financial outcomes. These data need to be used, analyzed and interpreted for decision making. The ability to use analytics is core to the AP. However, with volume of data, sometimes it is very strenuous for AP to handle. This is where collaboration with AI is fostered for advantage.

In the AP, technology becomes a **Key Success Factor (KSF)** and something that Accountants cannot do without, because Accountants work around businesses and organizations and there is very high correlation between AP and the economy as well as in social context. Also, if the **AP's ecosystem** is beginning to use a lot of technology, then definitely Accountants will be affected, and in one way or another are observed to have **convergence with technology**. This is how AI comes into the picture of AP and play a role in the work of Accountants, hence the collaboration. In Accounting, technology today is **ABCDE** – Artificial Intelligence, Blockchain, Cybersecurity, Data Analytics and Ethics. Ethics bring trust. It is the pinnacle of the AP.

2. How would you describe Disruption in the Accounting Profession?

Digital Disruption is a **megatrend** affecting the AP. But disruption possess poses both **risks** and **opportunities**. The MIA has put in place key initiatives to prepare members and all AP in ecosystem to leverage on these unfolding prospects and mitigate risks. Talking about disruption, AI is to **augment** Accountants, not to **replace**. The disruption in AP can be explained according to the report issued by **Asia Development Bank (ADB)** on 'How Technology affects Job'. ADB explains it through 4 quadrants.

Quadrant 1 - mundane and cognitive. Example: bookkeeping which is boring and need use of mind. This job is likely to be replaced. In fact, it is already being replaced. **Quadrant 2 - mundane but not cognitive,** rather vocational. Example: brick laying. Repetitive but no need use thinking. This is also likely being replace by AI. In fact, it is already being replaced. **Quadrant 3 – cognitive but specialized.** Example: CEO who does a lot of decision making and also the Financial Planning and Analysis team that use a lot of data for predictions. These jobs need skills and brain power for decision making – which is less likely to be replaced. **Quadrant 4 - not cognitive and not repetitive.** Example: Fashion designing and hairdressing which are not cognitive but special and customized. These are not easy for AI to replace. It will take years.

Therefore, disruption in AP describes how Accountants need to aim for **niche**, to not fall in the quadrants that are likely to be **replaced**. Based on several recent round table conversations, the banking sector is demanding people who are good in Accountancy and Coding. Although you may not be the main coder, but if you understand how coding works, then you can work with the programmer. These are the demands that emerge with disruption. So, for the disruption, the most important is for the AP to move from **one zone to another** and it is taking a lot of time for Malaysia, and it will take a lot of time, but again, better late than never.

3. What is your view on the opportunities created and threats ignited by AI? Should Accountants embrace it or fear from it?

Looking at the **threats**, there are **more opportunities**, because we are looking at areas in accounting that can be made more effective with the use of AI. For example, the Islamic Finance industry is demanding for individuals who are good at Accounting knowledge, Islamic Finance Principle and Finance. At the moment, there is none with abilities in all the three areas. Thus AI, like the IBM Watson is likely to come in where it will be trained for the area that the individuals are not so good at and then work with individuals who have the knowledge. This is when the scope of opportunities is wide with AI.

Another example is the case in Auditing, where stock take for Oil Palm Plantation is done using drones. Thus, usage of drones have become a problem solver for the limitations of human. In this itself, more jobs are created. It is the evolution of jobs. Jobs that are changing and at the same time, during this change, some are being replaced and new ones are created. It is a **cycle of evolution**. This is not new and this is not threat. The only threat is when you want to **stand still**. Thus, psychologically, **instead of fearing, Accountants should accept the change and embrace it**.

4. The level of positive or negative influence of AI on Accounting Profession is likely to be decided based on the ‘tech-embracing ability’ of Accountants. (This means, if they embrace, they are likely to enjoy a positive impact, and if not, vice versa). How importantly do you view this?

‘Tech-embracing ability’ of accountants is **indispensable**. It is the key attribute needed today. They have to be **agile, open-mindset, willing to change** and **embrace change management** because the economy and businesses are changing and embracing – even if people say not many businesses are changing, the question is how long are you going to survive? **Can you afford not to follow this trend?**

If you can **survive** and **afford** it, then take on the **risk of not transforming**, and **withstand it**. However, even with this, many **business** are **having problems** as they may be waiting, but the moment wave of change comes, they are **not be able to keep up with it**. Thus, it is essential for Accountants to embrace AI to be **augmented** at work, **rather than fearing** and being laid-back.

5. How would you encourage Accountants to embrace AI? What is your advice or suggestion to the Accountants today?

They have to be **agile, open-mindset, willing to change** and **embrace change management**. Accountants must not undermine the power of technology. Malaysia may be slow, but the disruption is already there, so there is **no reason to wait**. AI is the technology that **augments** human capabilities.

In Accounting and Finance, there is the AI-empowered RoboCFO, where financial statements are uploaded and the AI will do the ratio analysis and provide narrative on the balance sheet position and financial performance. So, since RoboCFO does this work, then accountants will do the advisory and provide more qualitative suggestions in a faster manner to clients. In specific, AI is allowing the Accountants to do more than they have done before with the help of AI, because work is detailed and consequently higher assurance.

Example, in audit, sampling is not needed, every item can be tested hundred percent, with complete accuracy. To embrace AI, Accountants can begin working on the following 5 principles, namely - **assess digital technology trends; identify capabilities; harness digital technology; funding and governance**.

6. In your opinion, is AI likely to complement and alter the role of Accountants and the Accounting Profession or replace Accountants and the Accounting Profession? If so, why?

The right terminology is that AI is ‘**augmenting**’ AP and ‘**not replacing**’. There are two words, ‘**harnesses**’ and ‘**augment**’. With harnessing, we can be augment better. It is filling up the gap, thereby changing and altering the roles. This is the **evolution of jobs** where **jobs are changing** and at the same time, during this change, **some are being replaced** and **new ones are created**. It is a cycle of evolution. Although AI has **exceptional proficiency** and where replacement is concerned, the need of Accountant is still there in the sense of the **new demands from the industry**. The focus area is getting the **right supply to the demands**.

7. How long (in years) would it take for the waves of disruption led by AI to transform the Accounting Profession? If so, why?

The time period is not easy to gauge because it really depends on the whole **ecosystem** and **global economy** as AP works in **tandem** with the **business community** as well as **sectorial growth**. But there is a percentage **increase year-on-year** in terms of **harnessing the transformation** as besides the transformation at big firms, small firms, like 3E have also begun embracing AI like ZERO (image recognition for invoices) for their process. Also, besides the **high-skilled** Accountants, the **low-skilled** Accounting technicians are also using AI software and tools to execute their work. **Their work is same, but the execution is different – making it more structured.** Against this backdrop, it can be gauged that it would not take long, **probably 3 to 6 years duration**.

8. What is your view on the continuity of the Accounting Profession with the intervention of AI?

The AP is very wide and the **continuity status** lies in the **foundation or founding role of the profession**, which is the **accounting and finance knowledge** itself and the role of taking **core** of the **financials** of the organizations. These two aspects are the core nature of the AP and which shall **continuously** need the **human touch** – thereby sufficient to have the profession **continue** for **indefinite** period of time. This is because **human knowledge** is **not** something AI can **easily emulate** and AI is developed by human, and in developing AI, human knowledge is needed. As far as **human knowledge** is **needed**, the human part of the AP is still there. In future, the AP shall be **humans and robots working together**. Human being cannot be taken out of the system altogether, otherwise the world will be full of robots which is **not practical**. Psychologically, for a moment, it would seem AI will replace Accountants, with the speed technology is disrupting, but with introspection, one will find out that it is **just a cycle, the cycle of evolution**, and that AP is to live.

SPSS ADDITIONAL RESULTS

SPSS – ADDITIONAL RESULTS

This section illustrate additional SPSS results for evidence pertaining the authentic use of SPSS. This section is only for viewing purposes.

PART 1: DEPENDENT VARIABLE

DV: The Evolving Role of Accountants in the Accounting Profession

Statistics					
	The AP is at the position of experiencing a cycle of evolution empowered by digitalization.	The AP stands at an opportunity to be complemented, but at risk of being replaced by AI.	If Accountants are to embrace AI, they are likely to enjoy a positive impact on their roles, if not, vice versa.	It is a common psychology for Accountants to fear and resist AI in the beginning than to embrace it.	
N	Valid	120	120	120	120
	Missing	0	0	0	0
	Mean	4.18	3.97	4.11	3.63
	Minimum	1	1	1	1
	Maximum	5	5	5	5
	Sum	502	476	493	435

PART 2: INDEPENDENT VARIABLE 1

IV: Artificial Intelligence as Opportunity Creator

Statistics

	The idea of AI replicating human reasoning to help you make better inference-based decisions is a good thing.	The idea of AI assisting you in ensuring technical decision making is free from biasness is a good thing.	I like working in an environment where: - AI completes monotonous and time consuming task for me	I like working in an environment where: - AI identifies errors in my work, teaches me corrective action and trains me on particular subject matter.	AI helps preserve secret tactics developed by my team for future projects. This is a positive aspect towards faster and better quality work.	AI gives me opportunity to improve my tech-skills; thereby elevating my ability to work hand-in-hand with AI.	Working with AI, accountants would be collaborators of technology rather than passive users of software.	With AI being able to read through large volumes of text in short time, it not only saves time but helps concentrate on other important decision making areas.	With AI increasing understanding of information, it promotes transparency in financial reporting - thereby allowing Accountants and shareholder s make better decisions.	With AI ensuring same depreciation method is used yearly, it helps comparability of financial results and fosters better decision making.	Since AI is a machine, it escapes tiredness, boredom and biasness. This would reduce human error and chances of high material misstatements.
Valid N	120	120	120	120	120	120	120	120	120	120	120
Missing	0	0	0	0	0	0	0	0	0	0	0
Mean	3.83	3.99	4.11	4.18	4.27	4.12	4.03	4.38	4.29	4.28	4.29
Minimum	1	1	1	1	1	1	1	1	1	1	1
Maximum	5	5	5	5	5	5	5	5	5	5	5
Sum	460	479	493	501	512	494	483	525	515	513	515

PART 3: INDEPENDENT VARIABLE 2

IV: Artificial Intelligence as Threat Igniter

Statistics

	AI performs accounting tasks proficiently and effortlessly. This has high potential of increasing redundancy.	In the near future, accountants may face difficulty getting employed if they omit to have necessary tech-skills.	Quantity and quality of data programme d into AI is important in order for AI to lead accountant s make right decisions.	AI may grant similar solutions to different problems. If AI to lead accountant s omit to check its relevance, the accounting work will lack significance.	Implementation of customized solutions to obtain different problems. Accounting area may require additional funding that firms may have not budgeted before.	Dealing with AI requires training pertaining to digital funding, that firms may have not budgeted before.	If companies do not begin allocating reserves for digital funding, they are at great risk.	The Accountant	I would reject using AI if I have no clue how to explain the results derived by AI.	I would reject using AI if I cannot rely on data processed by AI.	AI confuses accountant whether to probe, question and challenge ethical facets or follow so called accurate results of AI.	As an Accountant, I would reject using AI if decisions suggested by it compromis e my ethical independence.
Valid N	120	120	120	120	120	120	120	120	120	120	120	120
Missing	0	0	0	0	0	0	0	0	0	0	0	0
Mean	3.72	3.98	4.19	4.09	4.21	4.31	4.18	4.08	3.87	4.06	3.96	4.21
Minimum	1	1	1	1	1	1	1	1	1	1	1	1
Maximum	5	5	5	5	5	5	5	5	5	5	5	5
Sum	446	477	503	491	505	517	502	490	464	487	475	505

PART 4: LEVEL OF INFLUENCE OF AI on AP based on TEA

TEA: Tech-Embracing Abilities of Accountants

Statistics									
	Plan, formulate and implement a sophisticated strategy specifically to address digitization and the intervention of AI into my company.	Be flexible to move with the changes AI brings.	Move out of my comfort zone and dwell in an innovative culture of change.	Disrupt, redefine business strategy and establish an agile and experimental mindset in adopting AI.	Make an effort to understand digitization and disruption led by AI.	Understand, learn and adopt AI urgently.	In my opinion, I think AI will	In my opinion, this disruption (transformation) will happen in	
N	Valid	120	120	120	120	120	120	120	120
	Missing	0	0	0	0	0	0	0	0
Mean		3.87	4.03	4.06	3.94	4.20	3.64	1.20	2.35
Minimum		1	1	1	1	1	1	1	1
Maximum		5	5	5	5	5	5	2	4
Sum		464	483	487	473	504	437	144	282

LITERATURE MATRIX SAMPLE

SAMPLE OF LITERATURE MATRIX

NO.	NAME OF AUTHOR	YEAR	JOURNAL NAME	OBJECTIVE	VARIABLE/FACTORS	METHODOLOGY	RESEARCH
1	• Florin Aparaschivei	2007	Considerations on Accounting Intelligent Systems Importance	How managers can manipulate knowledge (a main organizational resource) through AI	<ul style="list-style-type: none"> • Expertise storing • Decisions automation • Expertise distribution • Commercial potential • Learning • Accounting decisions normalization • Competitive advantages 	Study conducted a content analysis: Qualitative Analysis	<ul style="list-style-type: none"> • In to-day's world, only those who embrace the right technology at the right time can face the new challenges and survive on a highly competitive global market.

2	<ul style="list-style-type: none"> • Amelia A. Baldwin • Carol E. Brown • Brad S. Trinkle 	2006	<p>Opportunities for AI Development in the Accounting Domain: A Case for Auditing</p>	<p>To study nature of accounting and auditing problems and the need for application of AI.</p>	<ul style="list-style-type: none"> • Genetic algorithms • Neural networks • Fuzzy systems • Hybrid systems 	<p>-selected 10 audit tasks out of 400 identified audit tasks that may have issues and how AI development is fruitful towards these tasks</p>	<ul style="list-style-type: none"> • Complex AI applications can be created to solve auditing problems more fully. • Accounting researchers must bridge the gap between the business and accounting domains and the computer science and AI domains and begin collaborations with AI researchers to improve auditing and assurance.
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3	• Cindy Greenman	2017	Exploring the Impact of Artificial Intelligence on the Accounting Profession	To find out: - <ul style="list-style-type: none"> • If machines are assuming a greater role, where do we, the professionals strike a balance? • What does the future of the accounting profession look like with the growth of artificial intelligence? 	• Learning technologies <ul style="list-style-type: none"> • Cognitive technology • Document review • Manual to Automotation • QuickBook Online 	• A comprehensive review about what Big Four and Accounting Bodies like ACCA have to say about AI changing role of Accountants <ul style="list-style-type: none"> • Study conducted a content analysis: Qualitative Analysis 	• The repetitive tasks of bookkeeping or process-driven assignments are more likely to be replaced with an automated technology than the higher value specialties that involve professional judgement. <ul style="list-style-type: none"> • AI in the accounting world will not replace accountants, it will simply change the focus.
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4	<ul style="list-style-type: none"> • Daniel E. O'Leary • Robert M. O'Keefe 	2017	<p>The Impact of Artificial Intelligence in Accounting Work: Expert Systems Use in Auditing and Tax</p>	<p>The study analyses the relative impact of expert systems on two different types of accounting work: auditing and tax.</p>	<ul style="list-style-type: none"> • Search • Exception • Understandability • Amount and Stability • Supervision • Technology 	<p>Study conducted a content analysis: Quantitative Analysis using questionnaire approach on Perrow's sociological framework as a basis for a comparative organization analysis of the impact of expert systems on organizational issues.</p>	<p>The systems allow the user the ability to solve a broader range of problems, while allowing the user the ability to perform more work. The comparison of auditing and tax expert systems indicates that audit systems seem to allow for greater control over search. Tax systems seem to allow more work to be done without supervision, make more decisions immediately, and allow the user to make a wider range of decisions.</p>
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5	<ul style="list-style-type: none"> • Daniel E. O'Leary 	2015	<p>Artificial Intelligence in Accounting and Auditing: Creating Value with AI: Value Creation from Expert Systems with an Economic Approach and Applications in Accounting, Auditing and Finance</p>	<p>To investigate how economic paradigms can cause AI to impact accounting profession in accounting, auditing and finance.</p>	<ul style="list-style-type: none"> • Economics of: - • Strategy and Value • Production and Innovation • Industrial Modelling Theory • Information • Team Theory 	<ul style="list-style-type: none"> • The discussion • draws on theories from a number of different economic disciplines 	<p>The specific nature of the elements in the discussion suggest or economic study of these phenomenon be grouped in the study of the economics of expertise and expert systems or the economics of knowledge and knowledge-based systems.</p>
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6	Eduardo Plastino Mark Purdy	2018	Game changing value from Artificial Intelligence: eight strategies	To help organizations realize the full potential of AI.	<ul style="list-style-type: none"> • Articulate AI's benefits to the C-suite • Reinvent HR into HAIR • Learn with machines • Appoint a chief data supply chain officer • Create an open AI culture • Go beyond automation • Combine AI's capabilities with the crowd in the cloud • Measure return on algorithms 	<ul style="list-style-type: none"> • Chosen 8 Strategies based on 16 chosen industries, to see impact on growth and output, existing and future. • Used growth in gross value-added (GVA) • Base-line case • Ai steady State • 2035 used as year of comparison 	AI can be a potential game changer in many industries.
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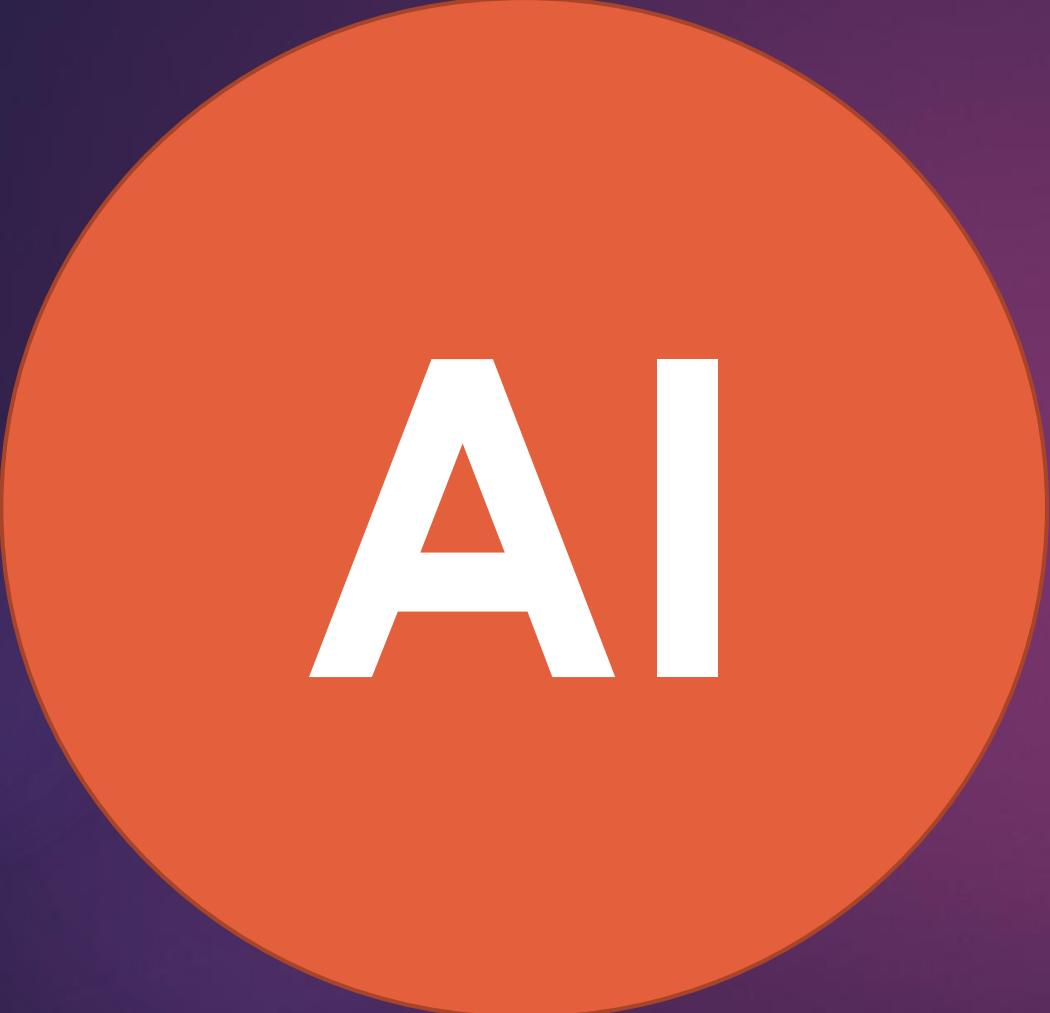
7	<ul style="list-style-type: none"> • Miklos A. Vasarhelyi • Alexander Kogan 	2016	Artificial Intelligence in Accounting and Auditing: Towards New Paradigms	To find out the expert system role in firms and impact on its professionals	<p>(1) maintenance of expert knowledge in the firm,</p> <p>(2) sharing of expert knowledge through the firm,</p> <p>(3) enhanced capacity of experts to manage large volumes of data and carry complex analysis,</p> <p>(4) improved quality and more efficient professional work,</p> <p>(5) flexible decision-making advice,</p> <p>(6) deeper understanding of the expert knowledge,</p> <p>(7) enhanced staff productivity,</p> <p>(8) increased services offered by the business, and</p> <p>(9) utility as an education and staff training tool.</p>	<ul style="list-style-type: none"> • The study is conducted based list of expert systems found in companies, in general. • Study conducted a content analysis: Qualitative Analysis 	Expert systems are becoming a reality in the accounting field, particularly in tasks where professional judgment is required. Their usage in accounting will have significant advantages.
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**SNAPSHOT OF THIS
THESIS ON A
MICROSOFT
POWERPOINT**

Artificial Intelligence as a Paradoxical Digital Disruptor in the Accounting Profession.

HARISAI DOSHI

RESEARCH SCHOLAR | AUTHOR

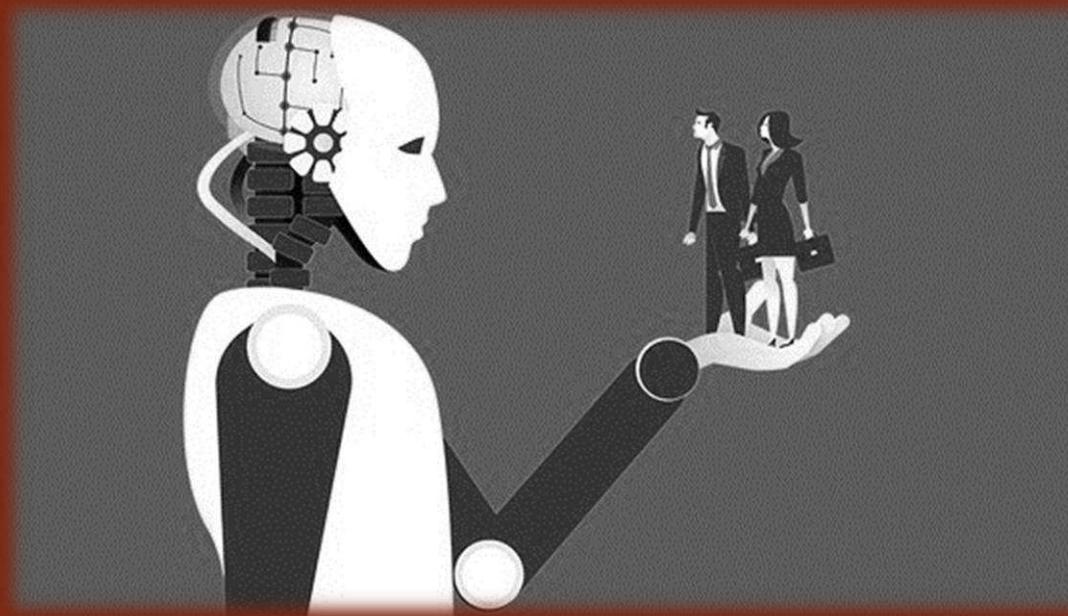


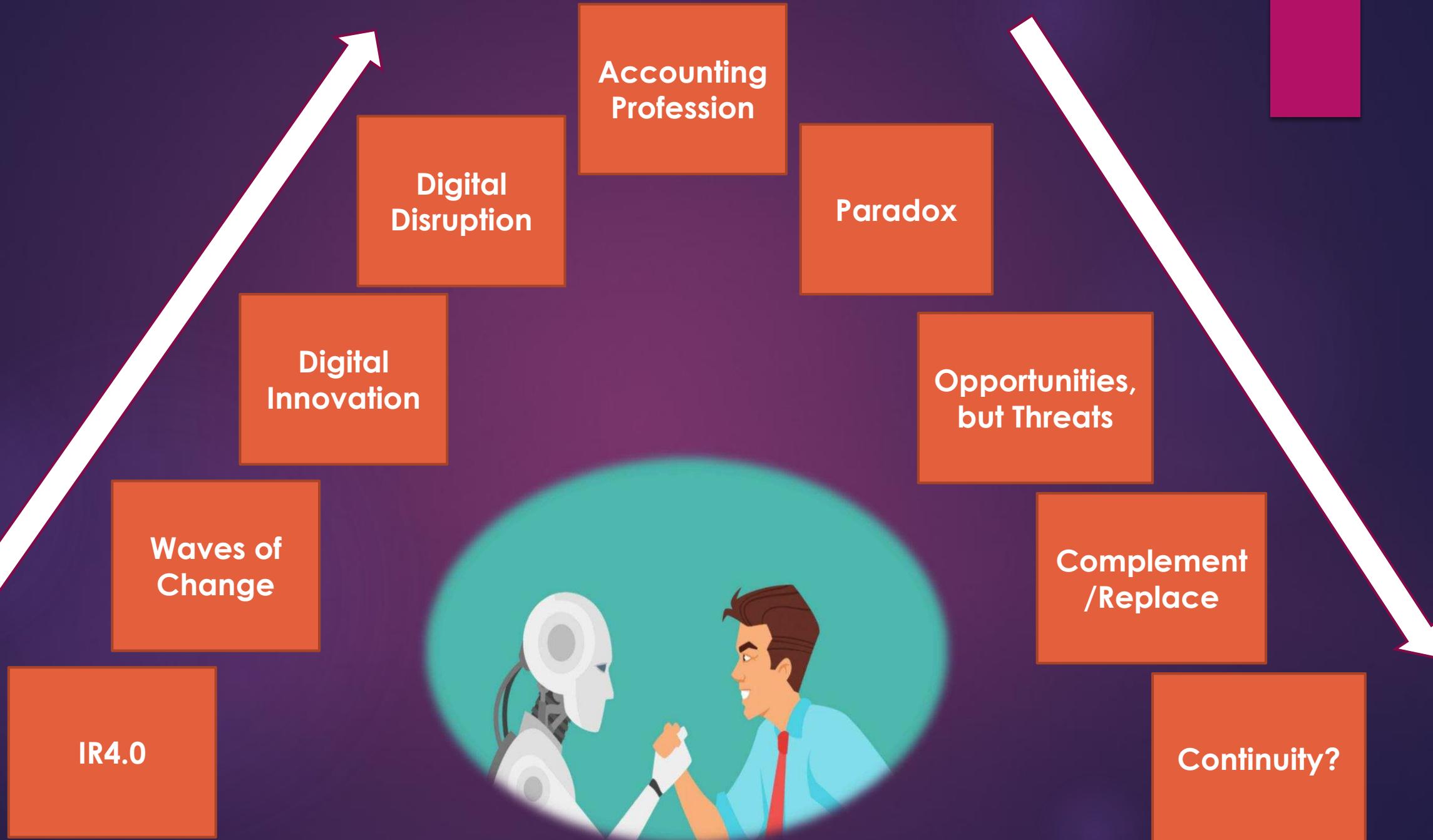
AI



AP

Setting the Tone





Background

Accountants – Mass Extinction

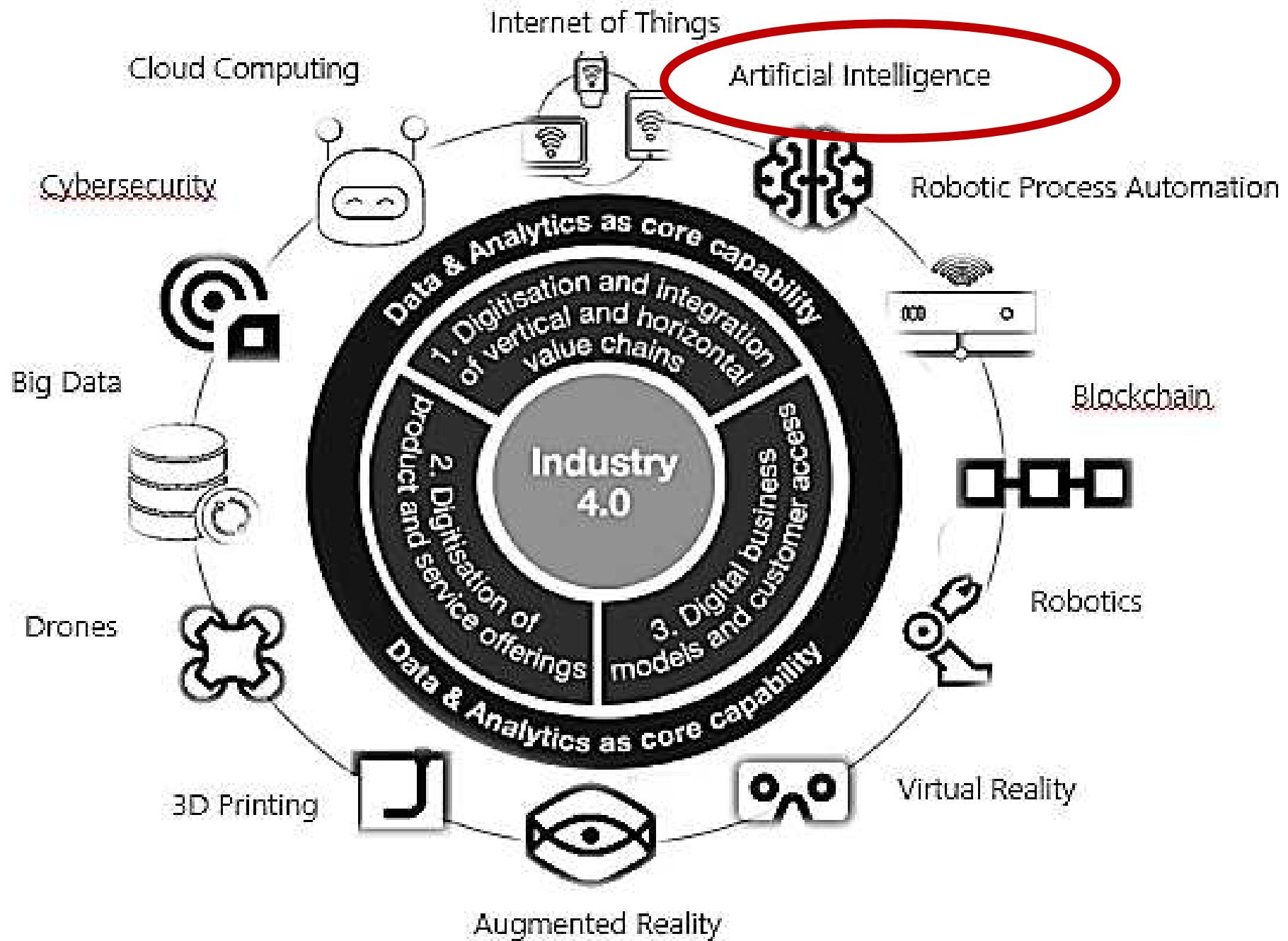
UK Daily Mail 2017:
‘Robots to steal 15 million of your jobs’

CNN declares the Bank of America report
estimating 90% or more risk of accountants being replaced by robots

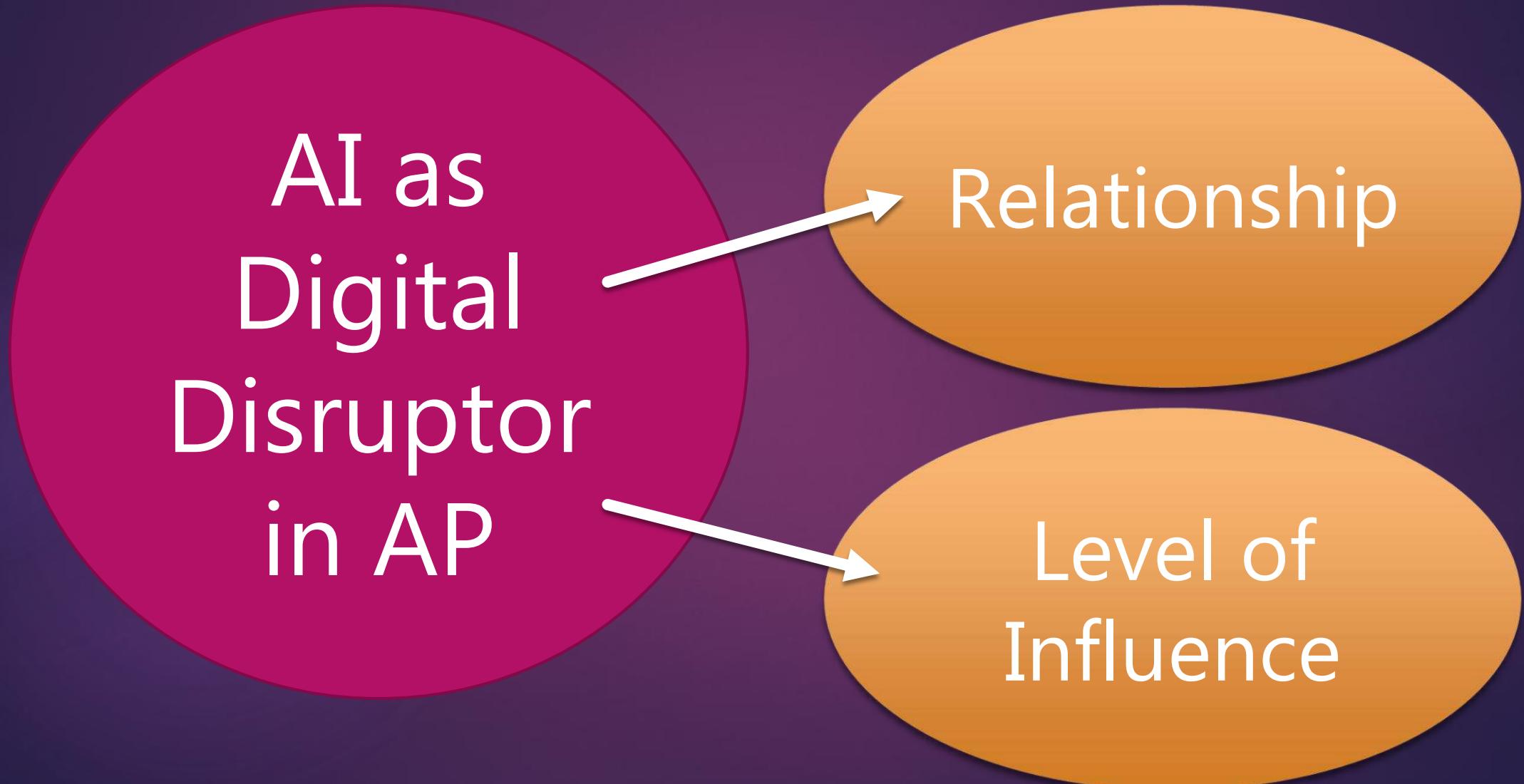
London Evening Standard Report:
technology develops, it will **replace** white-collar jobs in fields such as **accounting**

IFAC

MIA Digital Technology Blueprint



1 AREA, 2 Paradigms

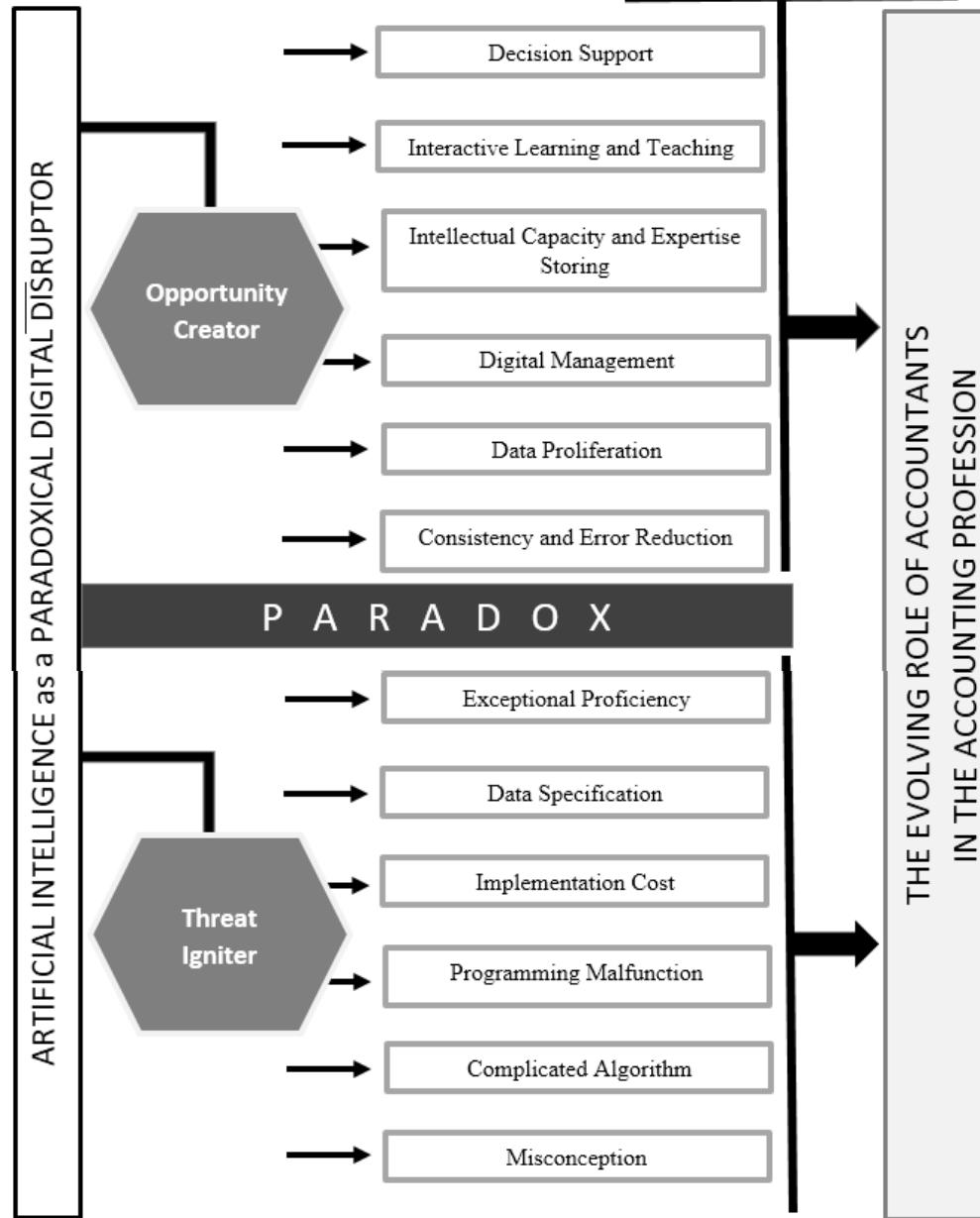


Relationship Paradigm

CONCEPTUAL RESEARCH FRAMEWORK

IV

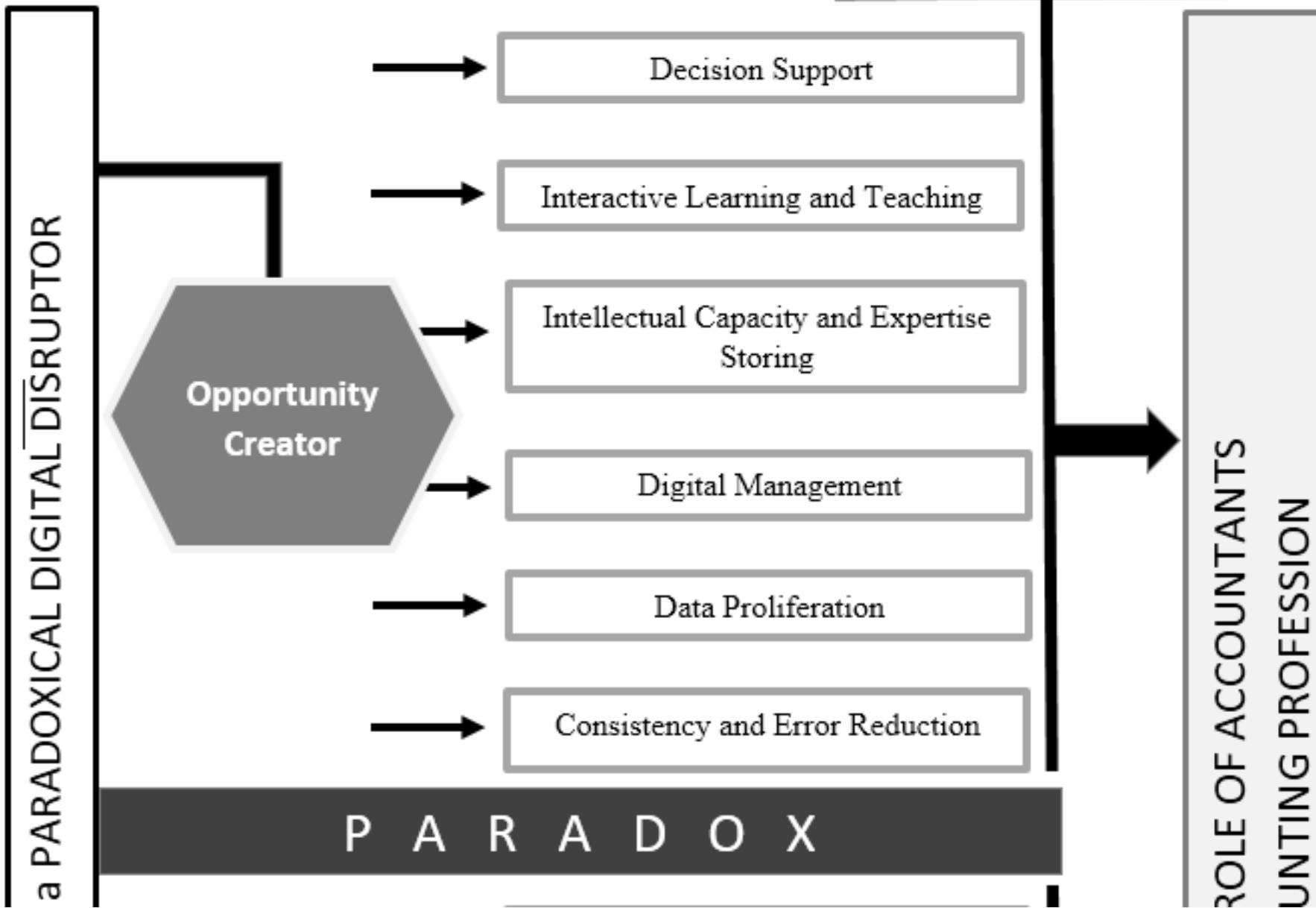
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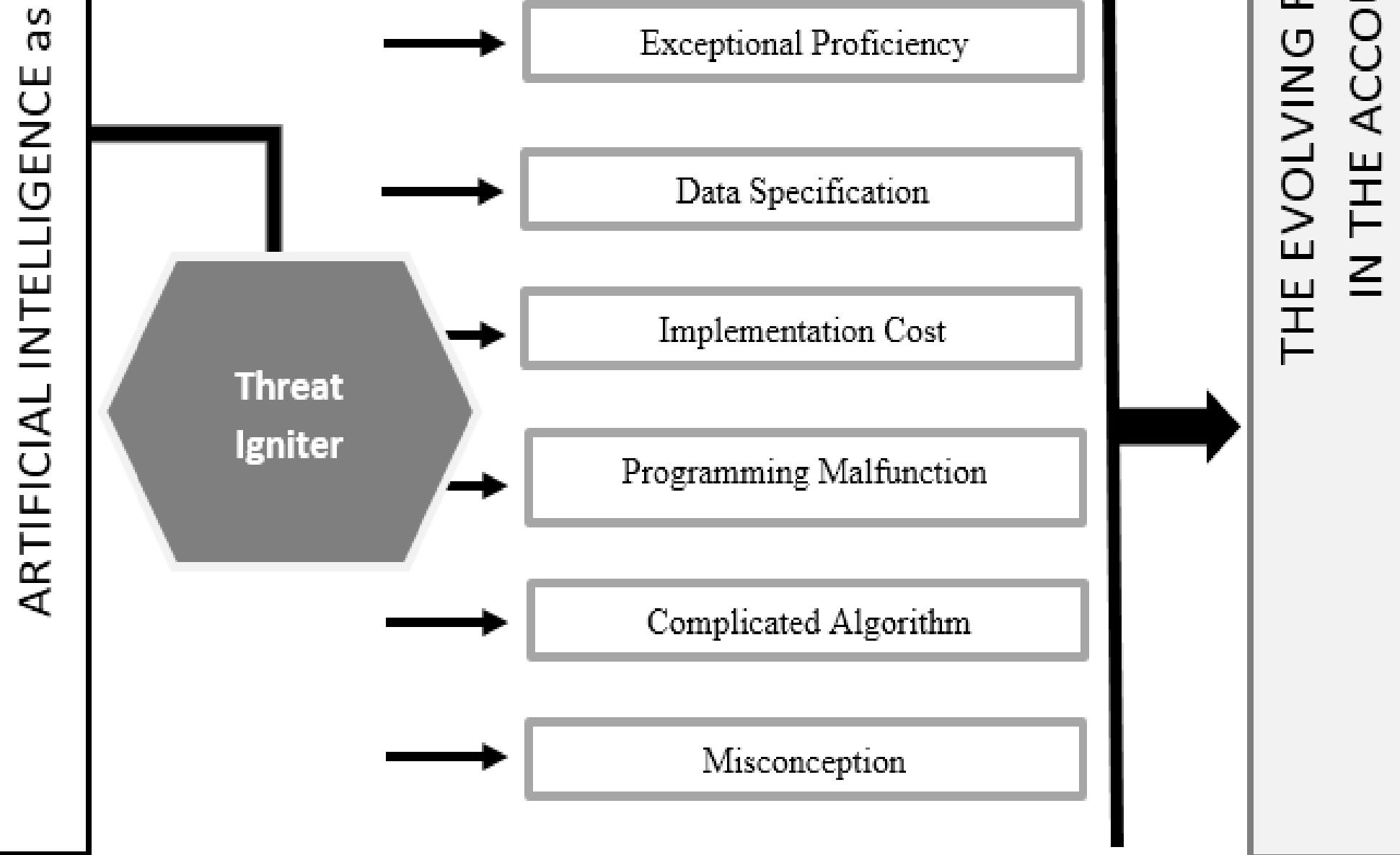


CONCEPTUAL RESEARCH FRAMEWORK

IV

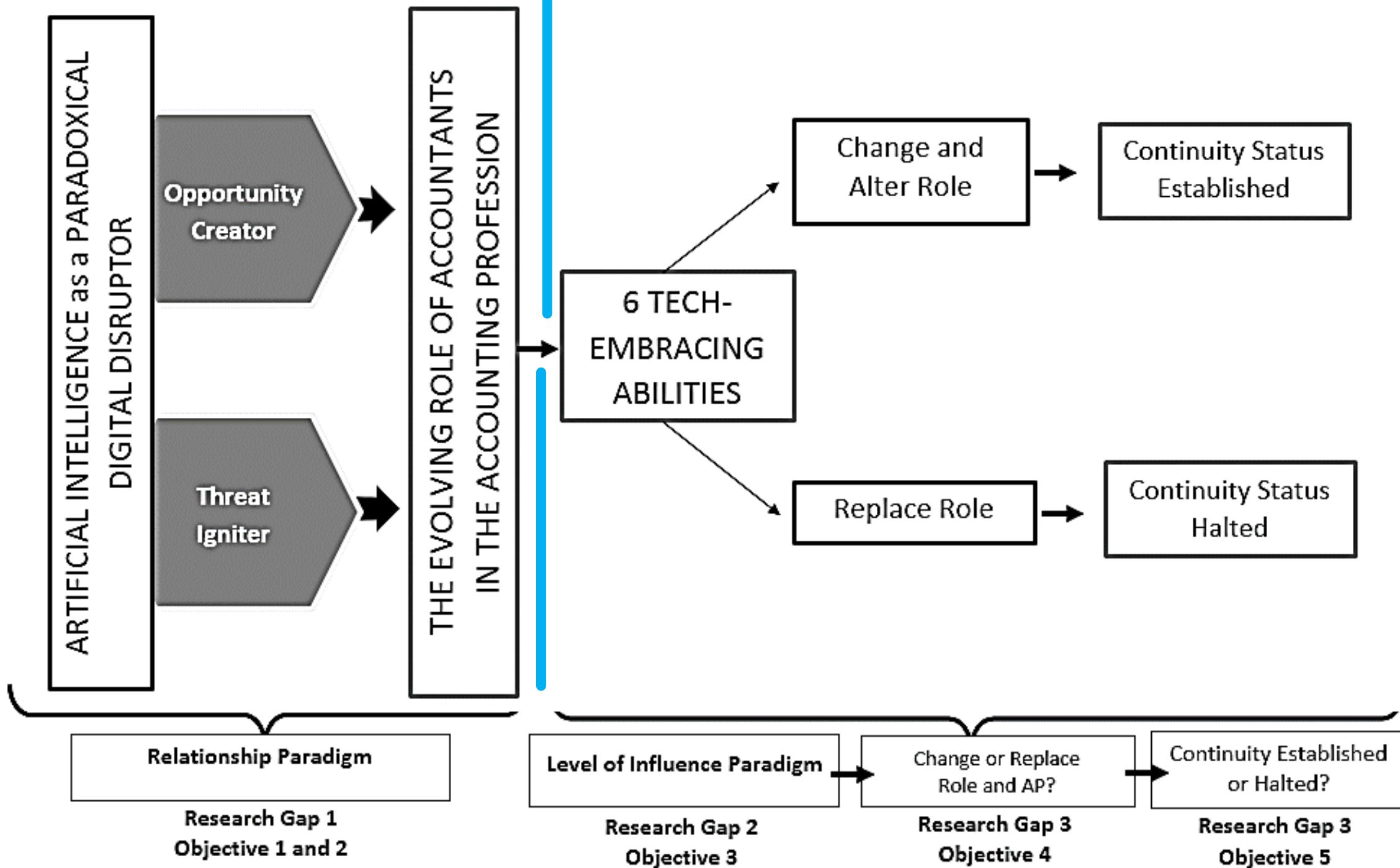
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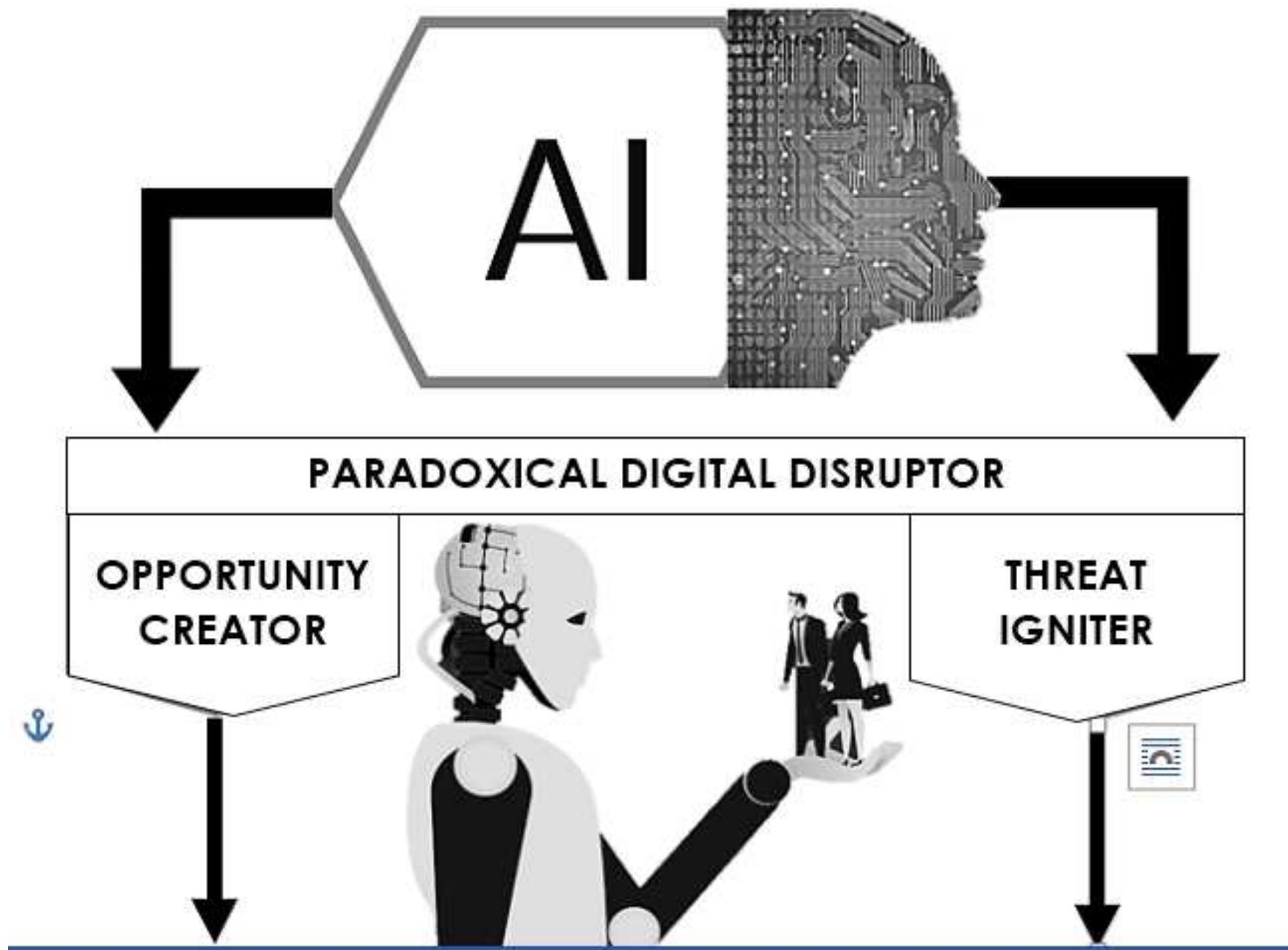


Level of
Influence
Paradigm



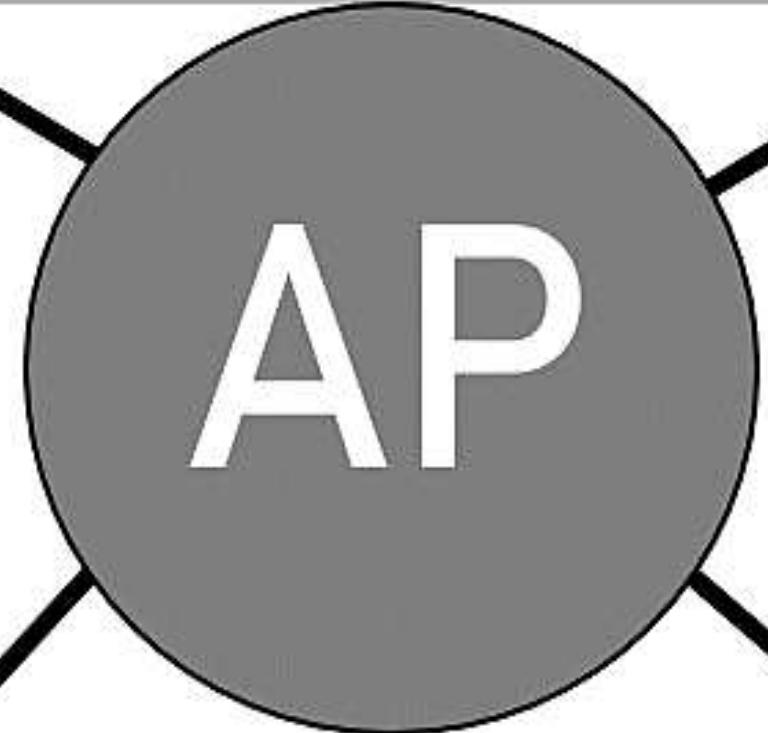
Literature

An Extensive Visual and Theoretical Articulation of the Literature



POSITIVE

Revolves around
Changing and
Altering the Role
of AP

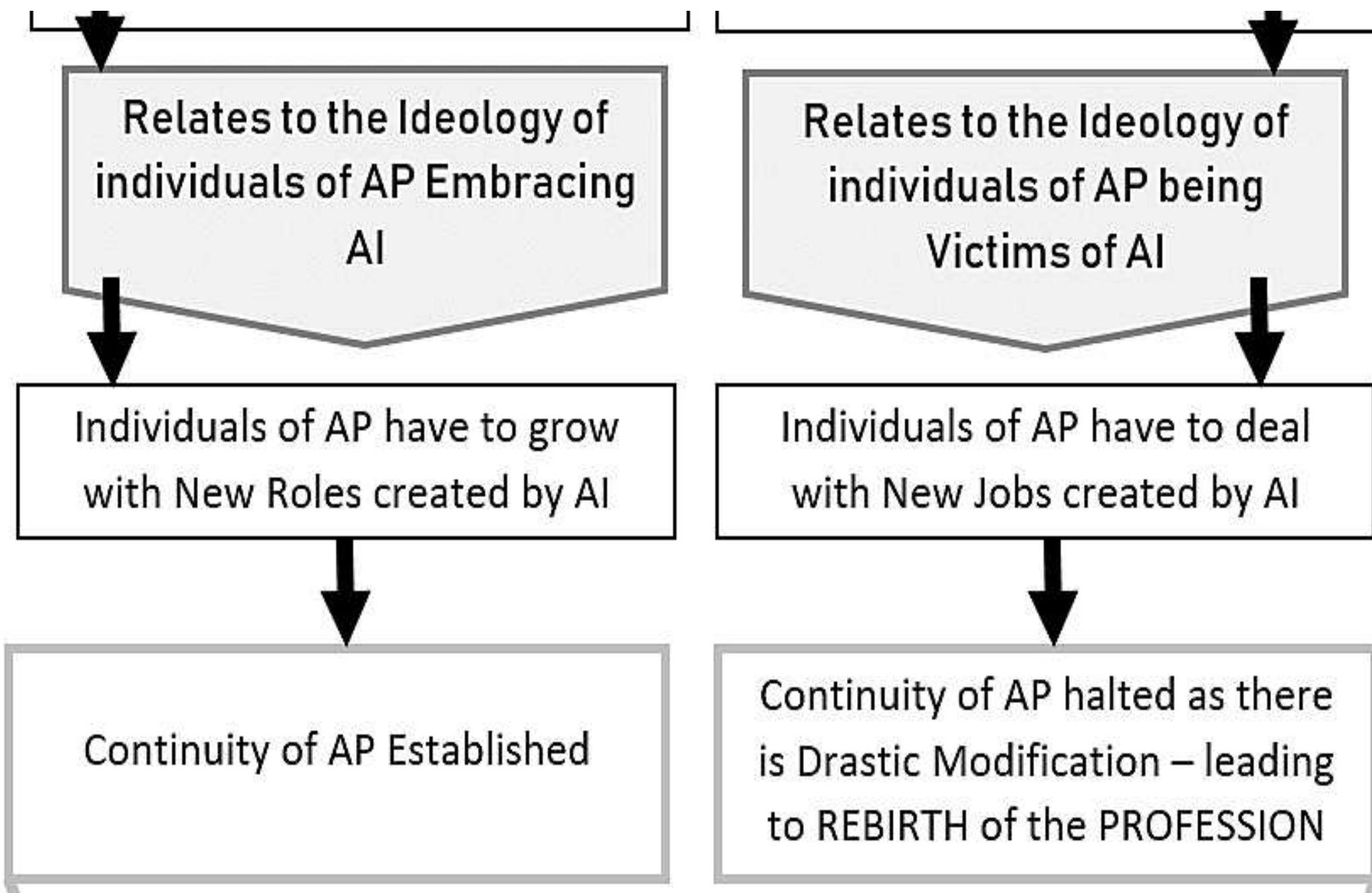


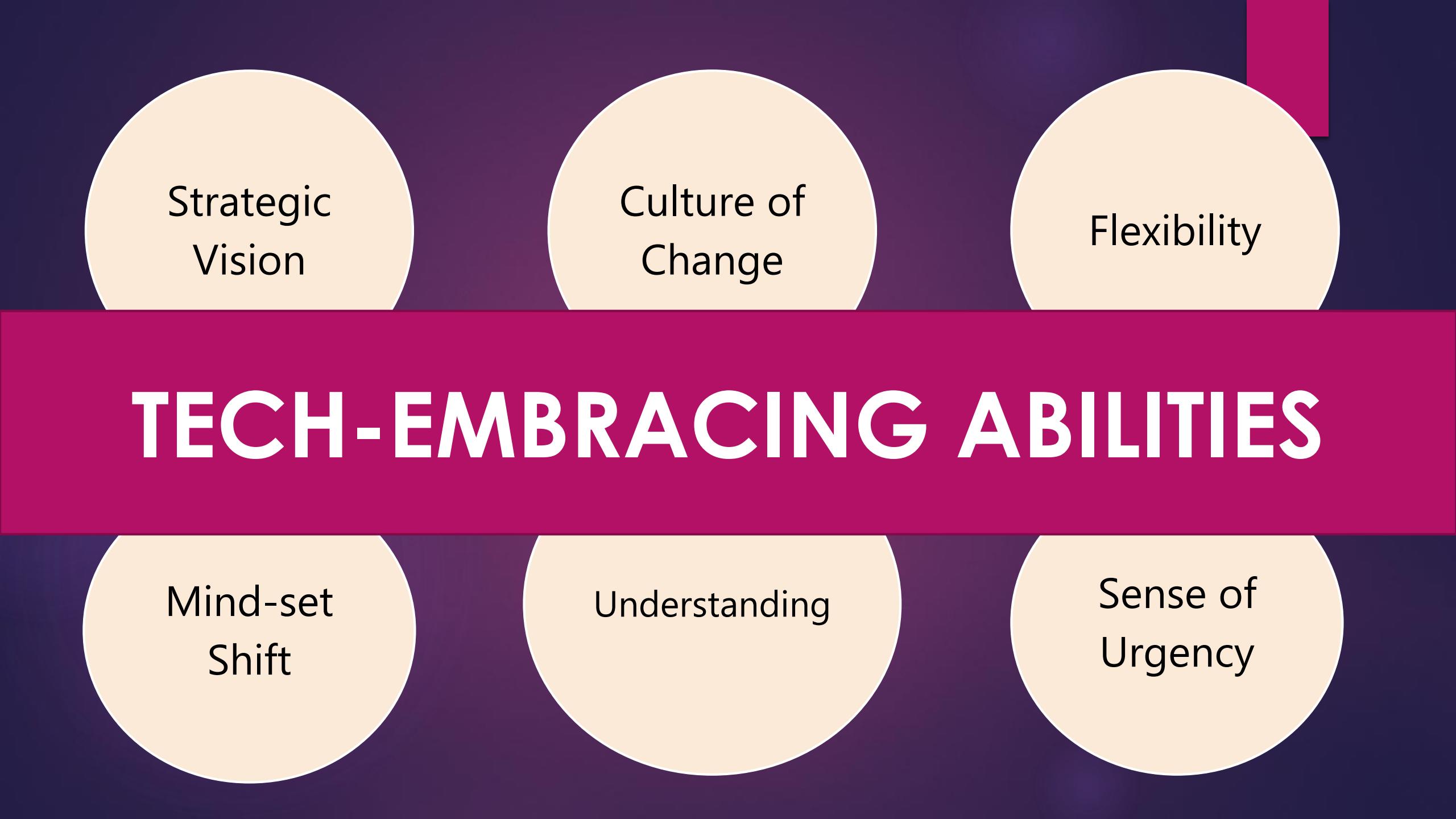
NEGATIVE

Revolves around
having tendency
of completely
Replacing the
Role of AP and AP

Individuals of AP become
Credential Experts as focus
directed to other important areas
out of new roles

Individuals of AP face a situation
of their need in industry becoming
insignificant till they experience
loss of job





Strategic
Vision

Culture of
Change

Flexibility

TECH-EMBRACING ABILITIES

Mind-set
Shift

Understanding

Sense of
Urgency

Problem Identification

Paradoxical Personality



Positive and Negative Aspects of AI



Opportunities and Threats towards AP

Level of Influence



Level of influence of AI on AP

Role and Continuity Status



Changing or Replacing Accountants



Continuity Status of AP

General Objectives

To examine the **relationship**
between AI and AP and the
degree of influence of AI on AP

Specific Objectives

To examine the relationship between AI as Opportunity Creator on AP.

To examine the relationship between AI as Threat Igniter on AP.

To examine the significant level of influence of AI as Opportunity Creator and Threat Igniter on AP.

To investigate if AI is changing role or replacing AP.

To ascertain the continuity status of the AP.

Methodology

**1 QUAN and 1
QUAL**

Pragmatism

**Theory of
Disruption**

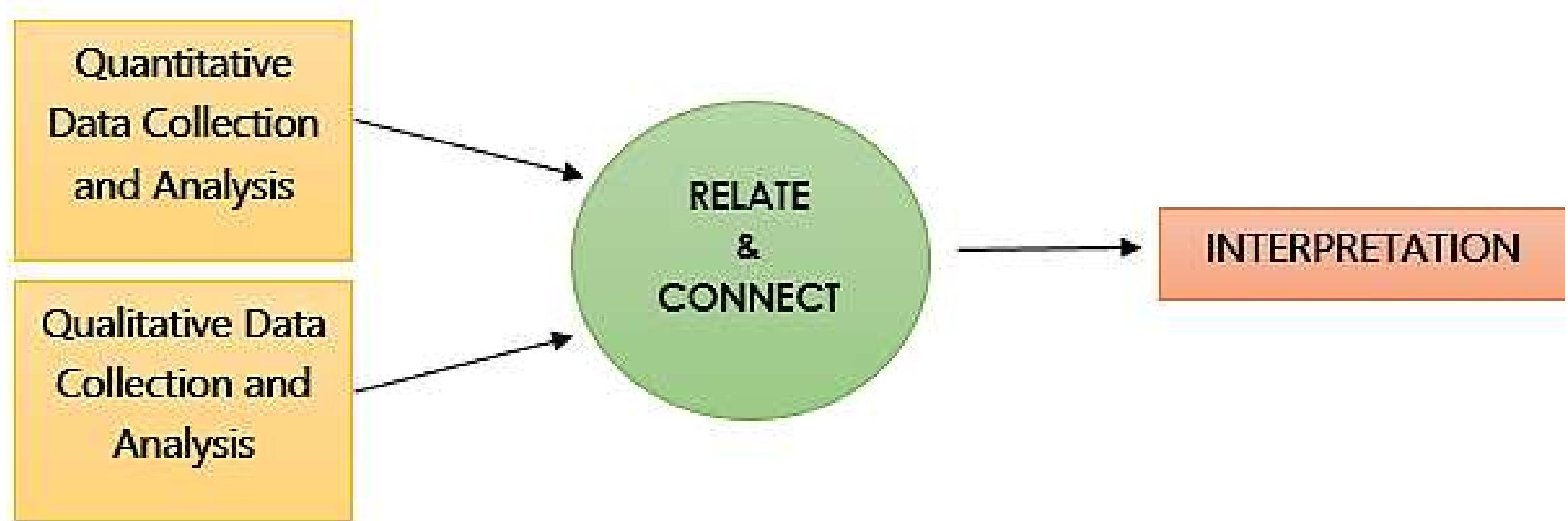
**MIXED
METHODS**

**Fixed Mixed
Method –
Predetermined**

**One data
source may be
insufficient**

**To enhance the
study with
second method**

Convergent Parallel Mixed Methods



Notation:
QUAN=QUAL

Purpose for Convergent Design

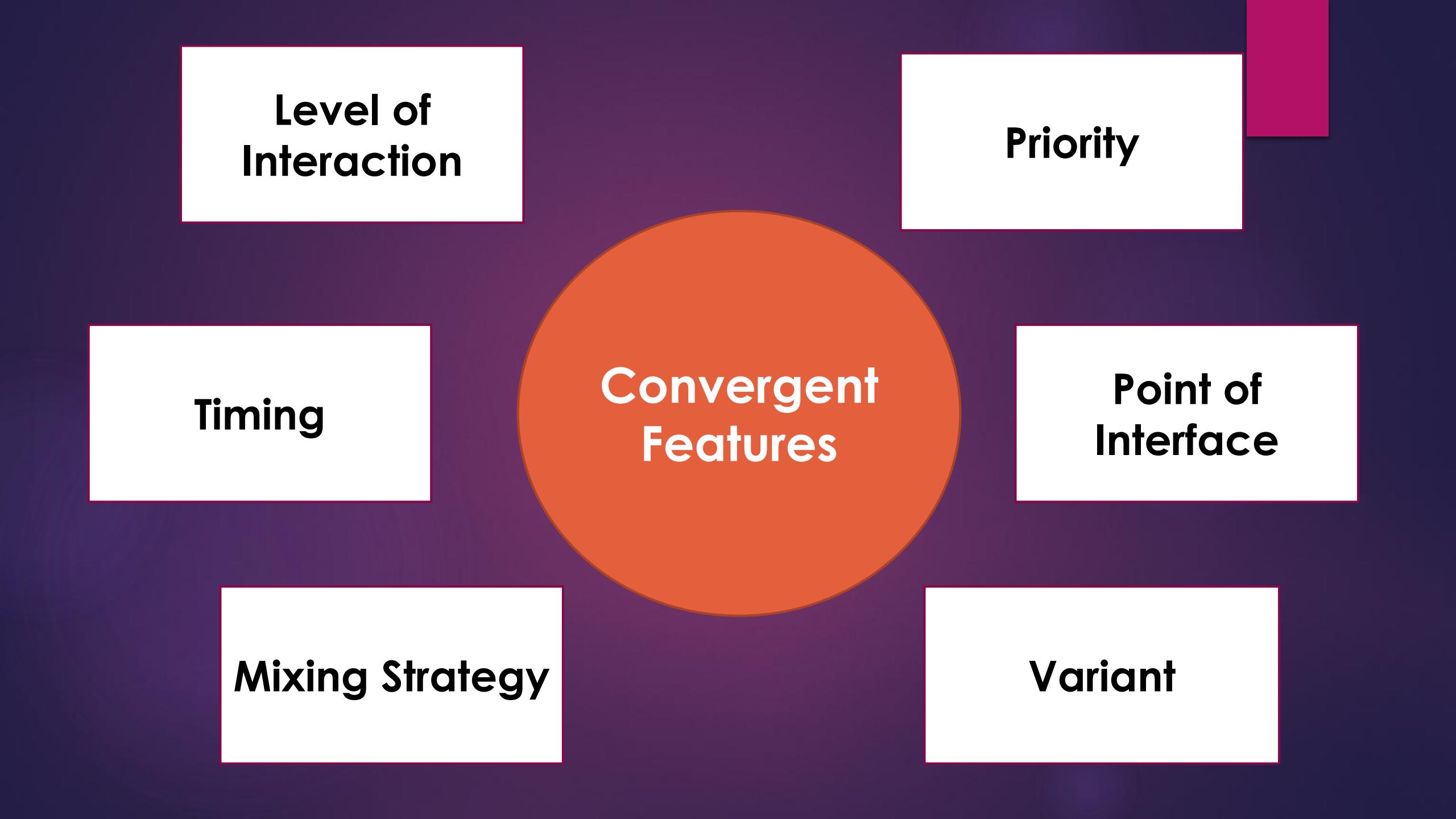
To provide a comprehensive account of the area of inquiry

To obtain different but complementary data on same topic

To develop complete understanding of the phenomenon

To elaborate and enhance results

To best understand the research problem



**Convergent
Features**

**Level of
Interaction**

Priority

Timing

**Point of
Interface**

Mixing Strategy

Variant

Data Collection

QUANTITATIVE



Questionnaire

33000
professional
accountants

68
sample size

Probability
Sampling: Raosoft

120
responses

Google
Forms

QUALITATIVE

68 quantitative
sample size:
professional
accountants

One-on-One
Interview

9 sample size

**Convenient
Sampling**

9 responses

Convergent
encourage
different size

Data Analysis

Quantitative

SPSS Test	Positive Relationship	Negative Relationship	Level of Influence
Descriptive (Mean)	4.18/5.0	4.06	3.69
Reliability: Cronbach's Alpha	0.819	0.820	0.879
Pearson Correlation	0.110=Positive 0.000 Sig.=Significant	-0.263=Negative 0.000 Sig.=Significant	TEA>0=Positive TEASig.<0.05=Significant
Regression: Anova	0.000 Sig.=Significant	0.000 Sig.=Significant	0.000 Sig.=Significant

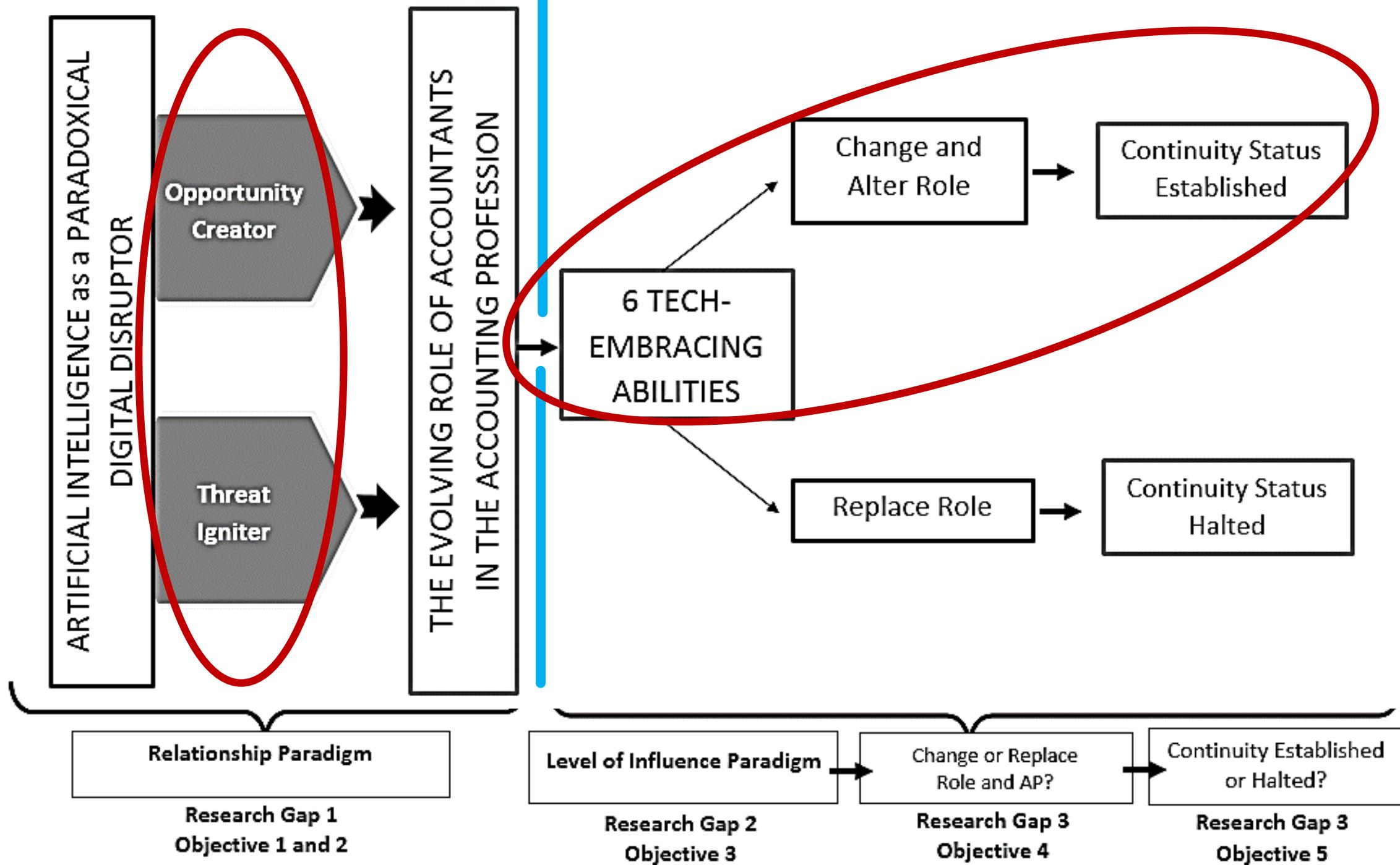
Data Analysis

Qualitative

Contextual Coding THEMES

	Positive Relationship	Negative Relationship	Level of Influence
	<ul style="list-style-type: none">1) Opportunity2) Complement3) Dual Impact4) Enabler5) Embracing Element6) Key Success Factor7) Ancient Convergence8) Tech Necessity	<ul style="list-style-type: none">1) Risk2) Replace3) Dual Impact4) Destructor5) Resisting Element6) Key Failure Factor7) Ancient Convergence8) Tech Luxury	<ul style="list-style-type: none">1) Strategic Vision2) Flexibility3) Culture of Change4) Mindset Shift5) Understanding6) Sense of Urgency

Findings



Recommendation

Technology is to **burnish** the Accounting Profession's **credentials** as a trusted advisor. Hence, it is **indispensable** for the profession to continue to **adopt** and implement emerging technologies or otherwise be left on the **sidelines**.

Rachel Grimes

President of the International Federation of Accountants



THANK
YOU