

UNIVERSITY OF KWAZULU-NATAL

**The Impact of Artificial Intelligence (AI) Technologies on Legal Practitioners  
in Law Firms and Legal Publishers**

By

Lee Adriaanse

Student Number: 961090611

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of

Master of Business Administration

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College of Law and Management Studies

Supervisor: Professor Ziska Fields

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## **Abstract**

Artificial Intelligence (AI) solutions currently have the capabilities to perform tasks quicker, more accurately and consistently than legal professionals. This could result in inducing the opinion in employers at private law firms and legal publishers that AI software may have a quicker return on investment and a lower total cost of ownership. The purpose of this study is to discover whether the availability of yield-producing, affordable AI technologies in the legal industry could lead to legal practitioners and their roles becoming redundant. An explanatory quantitative study was established using a cross-sectional descriptive survey design to achieve the objectives of the research. A self-administered structured questionnaire was developed and delivered via hardcopy and e-mail to 102 legal professionals by means of snowball sampling. These respondents were drawn from 19 different private law firms, legal publishers and legal departments at private corporations. Statistical analysis performed on the data collected was analysed and interpreted using descriptive and inferential statistics. The results revealed that there was a general awareness of advancement in certain legal AI solutions and there was a general agreement that legal professionals would advocate that their companies invest in AI Solutions if it produced additional accurate work yield while being cost-effective. The final revelation was that legal professionals agreed that AI solutions were not yet mature enough to replace human legal professionals. Regardless of this sentiment, they felt that they and their companies, would hire fewer legal professionals presented with the opportunity of value-adding legal AI solutions. Recommendations include legal professionals investigating the advancement and availability of AI solutions for the purposes of utilising it to strategically augment and bolster their job functions. Further recommendations include investigations into understanding their company's current capability and strength in comparison to their competitors and to understand how AI would augment their company performance to provide additional value in terms of insight and improve turn-around times. The final recommendation was for South African tertiary institutions of higher learning to start incorporating the topics of AI and Law into its Law Degree curriculum in an effort to make students aware of the advancement of AI in the area of Law and how it will affect their lives. The importance of this study is in the opinion of the professionals surveyed who believe that there was a strong possibility that they and their companies would hire fewer legal professionals if there was the availability of an economically beneficial legal AI solution which produced accurate, consistent, yield-producing output.

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## **List of Abbreviations**

<b>Abbreviations</b>	<b>Meaning</b>
ABC	Activity Based Costing
AI	Artificial Intelligence
CBR	Case-based reasoning
CCASA	Corporate Counsel Association of South
ECHR	European Court of Human Rights
IBP	Issue-Based Prediction
ICAIL	International Conference of AI and Law
IR	Information Retrieval
IRR	Internal Rate of Return
LSSA	Law Society of South Africa
MBA	Master's in Business Administration
ML	Machine Learning
NLP	Natural Language Processing
NPV	Nett Present Value
PESTLE	Politics, Economics, Social, Technological, Legal, Environment
POC	Proof of Concept
RBR	Rule-based reasoning
SPSS	Statistical Package for the Social Sciences
TAR	Technology Assisted Review

# CHAPTER ONE

## Introduction

### 1.1 Introduction

Artificial Intelligence (AI) is a branch of computer science established in 1956 and is concerned with the transcendence of the modern computer beyond the bounds of static logic gates and decision trees into the realm of intelligent decision (Makridakis, 2017). AI is defined as “The theory and development of computer systems able to perform tasks normally requiring human intelligence.” (OxfordDictionaries.com, 2017). Cognitive capabilities refer to traits, which are inherently human and inimitable by machines. Russell & Norvig (1995) discuss the advent of Cognitive Science, a field of AI, in the late 1980’s and define these capabilities as logical and mathematical reasoning, problem sensitivity or machine learning, visual perception, knowledge representation and Natural Language Processing (NLP) or the ability to understand spoken and or natural language.

AI systems require high degrees of computational power to produce human-like speed and accuracy with regards to making relevant decisions (Gollapudi, 2016). Modern computer graphics cards contain Graphical Processing Units (GPUs) that can produce 120 Teraflop (a unit of computing speed equal to one million million ( $10^{12}$ ) floating-point operations) decisions per second (Gray, 2017). Deep learning and neural network training requires intensive computational calculation which determines how quick the AI can make decisions. In some cases, usage of high speed GPU’s have reduced neural network training from weeks and days to hours, which means that the AI systems are capable of adapting and learning through expert-led training session in shorter time spans (Jones, 2017). Thus, the advancement of computer hardware is allowing AI systems to evolve in rapid increments in the realm of cognitive capabilities. Mills (2016) explores how the legal industry is currently using various AI technologies to assist lawyers with reading, processing and analysing copious amounts of documents like legislation, regulation and case judgments for the purposes of preparing for cases, predicting likely case successes, contract review and analysis, and legal research

Boianovsky and Trautwein (2010) analyses work presented by Austrian-born American economist, Joseph Schumpeter who espoused the concepts of technological unemployment. The

premise is that advancements in technology could lead to frictional or structural unemployment in the industry where the technology was presented. The specific application of AI in the field of Law and the theory of technological unemployment were the catalysts to formulating the topic of this dissertation. Upcoming chapters will explore further motivations for the study; explore the history of AI and Law and its current capabilities, which will be the foundation of this dissertation research.

## 1.2 Motivation for the Study

The theme at the World Economic Forum (WEF) (Parker & Thomson, 2016) was ‘Mastering the Fourth Industrial Revolution’, that is considered to be the exponential rate of the proliferation of the digital revolution, which has produced disruptive influences on every industry. These changes have been manifested through the transformation of management, production and governance practices through the fields of robotics, automation, artificial intelligence, 3D Printing, the Internet of Things and bio and Nano-technology (Parker & Thomson, 2016; Schwab, 2017). The World Economic Forum (WEF) as indicated by Parker and Thomson (2016) predicts that with the current rate of technological progression, there will be a total loss of 7.1 million jobs by 2020 (66% being lost in office and administrative roles) with a possible increased yield of 2 million jobs in the Computer, Mathematical, Architectural and Engineering fields.

There are various job roles and functions that employees can occupy in the legal industry, which include but are not limited to the roles and duties included in Table 1.1. The duties in italics are work items, which are candidates for automation through AI software while the remainder are duties where human legal professionals are needed and cannot be performed by current software technology.

**Table 1.1 Legal Roles and Duties**

Designation	Duties
Attorney	<ul style="list-style-type: none"> <li>• Negotiating settlements of disputes</li> <li>• Preparing cases for presentation in Court</li> <li>• <i>Drafting legal documents</i></li> <li>• <i>Conveyancers prepare documents for the transfer of land and the registration of mortgage bonds</i></li> <li>• <i>Notaries draw up specialised documents such as prenuptial contracts.</i></li> </ul>

Designation	Duties
Advocate	<ul style="list-style-type: none"> <li>• Experts in the art of presenting and arguing cases in court</li> </ul>
Candidate Attorney	<ul style="list-style-type: none"> <li>• Learn how to run practices including               <ol style="list-style-type: none"> <li>1. Administrative tasks</li> <li>2. <i>Briefing counsel</i></li> <li>3. <i>Lodge court applications</i></li> <li>4. <i>Research techniques</i></li> </ol> </li> </ul>
Court and Judges Clerk	<ul style="list-style-type: none"> <li>• Accompany judges in all sittings of the court sessions.</li> <li>• Manage the judge's diary on sittings and postponement of cases.</li> <li>• <i>Conduct research for the judge on legal matters.</i></li> <li>• <i>Administrative management of court documents</i></li> </ul>
Judge	<ul style="list-style-type: none"> <li>• Preside over criminal, civil and constitutional matters</li> </ul>
Magistrate	<ul style="list-style-type: none"> <li>• Adjudicates criminal and civil cases in court.</li> </ul>
Paralegal or Legal Assistant	<ul style="list-style-type: none"> <li>• Attending court</li> <li>• Making appointments with clients</li> <li>• <i>Keeping records up to date</i></li> <li>• <i>Typing up legal documents</i></li> <li>• <i>Answering the phone</i></li> <li>• <i>Organising diaries</i></li> <li>• <i>Preparing court forms</i></li> <li>• <i>Performing legal research</i></li> </ul>
Registrar	<ul style="list-style-type: none"> <li>• Administration</li> <li>• <i>Issuing of legal documents e.g. warrants and subpoenas.</i></li> <li>• <i>Document management</i></li> </ul>
Stenographer	<ul style="list-style-type: none"> <li>• Administrative support</li> <li>• <i>Perform digital recordings of court proceedings</i></li> <li>• <i>Transcribing thorough court proceedings</i></li> <li>• <i>Filing transcripts</i></li> </ul>
Translator	<ul style="list-style-type: none"> <li>• <i>Interpreting between languages</i></li> </ul>

Adapted from: Law Society of South Africa (2017) as well as The DOJ & CD (2017) and Marumoagae (2017).

A Study by McKinsey Global Institute reveal that tasks such as document review, case administration, document drafting, due diligence, legal research and analysis (which occupy 46% of a lawyer's time) can be competently performed by contemporary AI solutions (Chui, Manyika,



& Miremadi, 2015). These findings were further corroborated by studies undertaken by Frank Levy at MIT and Dana Remus at University of North Carolina School of Law (Remus & Levy, 2015). Given these statistics, this research casts its analytical eye towards the Legal Industry whose subsistence workload is based on procedural and administrative tasks and seeks to understand whether employees of legal firms and legal publishers feel that AI solutions could impact upon their jobs.

While AI has not reached the level where it could replace all specialist roles within the legal industry, it can, however, perform certain administrative and procedural tasks quicker and more accurately than their human counterparts (Remus & Levy, 2015). The topic is being explored as it has a direct impact on legal professionals, especially Law firm partners as it will make them aware of AI solutions which could provide them with a sustainable competitive advantage with regards to performing laborious research and administrative tasks quicker.

### **1.3 Focus of the Study**

The study will focus on the effect of AI and whether it has the propensity to reduce the need to hire legal practitioners in private law firms and legal publishers. Private law firms and legal publishers are the focus of this study as this is where AI solutions are being targeted and used at present (Mills, 2016). The study is intended to benefit law firms and legal publishers in understanding the current capabilities of AI solutions and how it could assist their organisations. Secondary beneficiaries are paralegals and law graduates who perform legal administrative tasks and legal researchers and editors who read, analyse and enrich case law and legislation. The study will contribute towards a better understanding of whether these functions are now becoming obsolete or need to be augmented to incorporate a technical skill-set, which was never needed before.

### **1.4 Problem statement of the Study**

AI solutions currently have the capabilities to perform tasks quicker and more accurately than legal professionals (Chui et al., 2015). The problem statement therefore, is that AI software could perform legal job functions better and faster than their human counterparts and as such could induce the opinion in employers at private law firms and legal publishers that AI software may have a quicker return on investment (ROI) and a lower total cost of ownership (TCO). The result being that employers would hire less legal professionals in lieu of purchasing legal AI software.

The purpose of this study is to discover whether the availability and affordability of AI technologies in the legal industry could lead to legal practitioners and their roles becoming redundant as AI solutions become more advanced. Since AI adoption is in infancy, it would be hard to determine its direct impact on the reduction of hiring legal practitioners through statistical cause and effect mechanisms. The study will therefore attempt to measure possible impact through the opinion of employees at private law firms and legal publishers. Employees cover the following job roles: attorneys, company secretaries, candidate attorneys, paralegals, legal researchers and legal editors. The significance of selecting non-management roles is that legal assistants, candidate attorneys and librarians are often the drivers behind technology being suggested and adopted, as well as candidate attorneys becoming the future managers who will decide to what extent AI will replace the legal professional. The literature review depicts the advancement in use of AI solutions in the legal industry since the turn of the decade. The trend of progression of AI technologies, computing power and storage, suggests that new solutions will arise in the near future to produce more accurate, consistent and quicker results in completing legal tasks. These effects have prompted the investigation into the perceived impact of AI Technologies on legal practitioners in law firms and legal publishers.

### **1.5 Research Questions**

Based on the problem statement of the study, four research questions were generated to explore the problem and perceptions of employees at law firms and legal publishers. These questions are:

1. To what extent are employees at law firms and legal publishers aware of advancements and availability of AI (independent variable) in the legal field?
2. How likely are employees at law firms and legal publishers to invest in AI if it was accurate, quick and consistent (mediating variable)?
3. How likely are employees at law firms and legal publishers to invest in AI if it was affordable (moderating variable)?
4. What is the sentiment of employees at law firms and legal publishers with regards to reducing the recruitment of legal practitioners (dependent variable) if there was the availability of accurate, fast, consistent, affordable AI solutions?

The research questions stated above were translated into research objectives stated below.

## **1.6 Objectives**

This research seeks to achieve the following research objective via theoretical grounding and analytical methods:

- To ascertain if employees at law firms and legal publishers are aware of advancements of AI in the legal industry.
- To determine if there is a perception that law firms and legal publishers would use AI if it was accurate, quick and consistent to use.
- To investigate if there is a perception that law firms and legal publishers would use AI if it was affordable.
- To determine the perception of the effect that AI solutions would have on the hiring of legal professionals at law firms and legal publishers.

## **1.7 Research Methodology**

The research plan was devised by first surveying contemporary business issues. Artificial Intelligence and software automation emerged as having a possible impact on the global workforce. Further examination of literature surfaced the advancement of AI in Law while proponents of automation and the fourth industrial revolution suggested that AI would cause structural unemployment (Mills, 2016; Parker & Thomson, 2016; Schwab, 2017). These articles would be the foundation for the research plan which could be described as follows:

1. A research problem was selected: The development of AI could have an impact on the hiring of legal professionals at private law firms and legal publishers.
2. Literature and theoretical grounding was reviewed: the theory of technological unemployment was found to be the theoretical underpinning of this research
3. A conceptual framework was designed: to describe a causal relationship which would inevitably form the research questions and objectives.
4. The research methodology was selected: the identification of research variables in conceptual framework identified a causal relationship which needed to be explained. The time constraints of the study steered the research to using a qualitative methodology which was explanatory in nature.
5. The research design was formulated: A descriptive survey design which was cross-sectional in nature was selected and a self-administered structured questionnaire was the tool utilised for the purposes of data collection. The research instrument was hand delivered

as a hard-copy and emailed electronically as a secured editable word document. The data collected was numerically codified to provide quantitative data which could be statistically analysed with the SPSS package.

6. The data collected was analysed and interpreted using:
  - a. Descriptive statistics such as mean and standard deviation for the variables defined was calculated from data captured and was presented via tabulated data and graphs.
  - b. Inferential statistics was achieved through the use of the following techniques:
    - i. Chi-square goodness-of-fit-test
    - ii. Binomial tests
    - iii. Spearman's correlation tests
    - iv. One sample t-test
    - v. Independent samples t-test
7. Results were presented and discussed.
8. Recommendations were provided from the findings.

### **1.8 Limitations of the Study**

The study makes a valuable contribution to understanding the opinions of legal professionals with regards to how AI is perceived to impact on the legal industry regardless of the limitations of the study.

Limitation of the study include:

- Attorneys and especially fee earners at law firm make their money by selling time to clients. As such, they were reluctant to spend time completing the questionnaire timeously or even at all.
- Survey respondents were not educated as to what AI is or its potential in the legal industry; as such, a 1-page info-graphic detailing the usage of AI in Law was attached to all surveys distributed.
- Legal practitioners may have felt threatened by the subject matter and may have given biased answers in the survey.
- The survey instrument and the scope of the study focussed on legal publishers (companies who hire university graduates or admitted attorneys to produce and edit legal documents and manuscripts) and private law firms or legal departments in private corporations in Durban, KwaZulu-Natal, South Africa. Thus, the opinion of Public Law was omitted.

- AI in the context of this study are all fields of AI where solutions exist for the legal industry.
- The focus of the study was only in disciplines of law where AI solutions can perform tasks that legal practitioners can perform.
- Legal Practitioner refers to the following job roles:
  - Attorney/ Fee Earners
  - Company Secretary or legal counsel
  - Candidate Attorney
  - Paralegal or Legal Assistant
  - Legal Researchers
  - Legal Editors

## **1.9 Structure of Study**

The research study was structured in the following format, which explained how the individual chapters progressed into each other as well defining the objective of each chapter.

### **Chapter 1: Introduction**

This chapter outlined the background to the study and what problem statement it seeks to understand. It states what the purpose of the study is and how it would contribute to the generation of new knowledge and which stakeholders the study would benefit. It continues to state the research objectives including limitations of the study and provides a holistic structure of the research.

### **Chapter 2: Literature Review**

This chapter focuses on exploring relevant available literature regarding the progression of AI technology over the past 30 years and its commercial utilisation over the past 10 years. The literature review then explores the opposing opinion in academia and commerce concerning the current capabilities of AI and discusses the gaps in the literature that has provided the inspiration for this current study. The chapter then discusses the theoretical grounding of the research and proceeds to identify the key variables for a conceptual model that can relate independent variable of the availability of AI to the dependent variable of reduction in the hiring of legal of professionals. This conceptual model was then explored via a suitable research design and methodology, which was covered in Chapter 3 of the study.

### **Chapter 3: Research Methodology**

The goal of this chapter was to develop a suitable research design and methodology that could measure and analyse the research variables identified in Chapter 2 of the study. It will detail the type of research conducted, target population, sampling techniques, the research instrument, and validation of the instrument and concludes with a discussion on the ethical governance of the study.

### **Chapter 4: Results and Discussions**

This chapter will state the results of the research instrument that was developed and administered in chapter three. The raw data will be tabulated, codified, sanitised and analysed via statistical methods. The results presented will be discussed in relation to the objectives defined earlier on in this chapter.

### **Chapter 5: Conclusion and Recommendations**

The objective of this chapter was to review whether all the research objectives of the study outlined in the chapter one had been achieved. The chapter also identifies the significance of the findings of the research and presents opportunities for future research.

#### **1.10 Chapter Summary**

The fourth industrial revolution is upon us according to subject matter experts, and with it comes the threat of technological unemployment due to advancements in technology and automation. Honing down into the legal industry, surfaces a similar promise. Artificial Intelligence solutions have progressed due to the advancement in computing power, cloud platforms and storage capabilities, to the point where they are performing legal administrative tasks as good as or better than human legal professionals compute. This chapter outlined the motivation and focus of the study, the problem statement and the research objectives. It also included the limitations and the structure of the study. The next chapter focuses on the establishment of an official AI and Law consortium, a timeline of AI and Law solutions progression, how AI is currently being used commercially today and the opinions of academia and commerce who do not believe that the role of the legal professional is in danger just yet. The chapter will conclude with the theoretical background upon which this study is underpinned and the formulation of a conceptual framework which will be used to steer the remainder of the research.

# **CHAPTER TWO**

## **Literature Review**

### **2.1 Introduction**

The research questions guiding this dissertation are used to provide a lens, through which literature must be examined, categorised, synthesised, summarised and presented. The literature being examined proceeds to review the current corpus of information regarding the history and symbiotic progression of the field of AI and Law over the past three decades. The field of study within the topic of AI and Law will be presented along with the advancement of commercial AI solutions in the legal industry and adoption rates by global law firms over the past decade. The literature discusses where AI technology has reached or surpasses human capabilities and throughput but also objectively depicts where computer software has reached its limit and is incapable of conducting a legal task without the need for a human legal professional.

Gaps in the current literature will be discussed, which is the deficit area that has inspired the research problem and objectives upon which this dissertation is based. The journey to crystallise a meaningful research topic and research design leads the discussion in the direction of the Theory of Technological Unemployment: the theoretical framework upon which the conceptual model to this research problem is based. The review will conclude with the evaluation of a conceptual framework, which will state the various variables being investigated and their relationship to each other.

### **2.2 30 Years of AI and Law**

AI and Law is a field of the broader realm of AI and focuses upon reasoning, representation, argumentation and learning – core tenants of classical AI (Bench-Capon et al., 2012). The birth of this field can be sourced as far back as 1970 where legal experts produced articles discussing the possibilities of the use of analogical reasoning to model legal research and reasoning in the activities of legal analysis, argument construction and legal advice (Carneiro, Novais, Andrade, Zeleznikow, & Neves, 2014). It was at the first International Conference of AI and Law (ICAAIL) held in Boston in 1987 that saw the establishment of the first AI and Law community. The conference is held every two years and unites the international leading subject matter experts to share their thoughts and present papers on their current work and developments in the field of AI and Law (Bench-Capon et al., 2012).

While the main topic of this study is to focus on the AI solutions available to the legal industry, it is important to understand that the antecedent to these solutions is a culmination of the last 30 years of research and development in the field of AI and Law. A comprehensive history of the academic work has produced today's viable commercial products for the legal industry (Bench-Capon et al., 2012; Rissland, Ashley, & Loui, 2003).

Classical AI was popularised by the physical symbol systems introduced in the 1980's. This approach of AI was to categorise words, phrases or concepts as symbols and used these symbol hierarchies or ontologies with decision trees to answer questions or make decisions (Maglio & Spohrer, 2013). An alternative form of concept categorisation method was proposed by Richard K. Belew in 1987, called the *connectionist approach* to conceptual information retrieval. According to (Belew, 1987; T. Bench-Capon et al., 2012) this sub-symbolic approach imitated the workings of the human neural network which provided a solution to classifying concepts and information through association rather than through defined rules fed through large amounts of training data. This would be critical to analyse law, whose rules are based on context, geographical and social constructs and can be argued subjective in nature (Grabosky, 2013).

Classic expert systems are systems that can be built from complete and consistent sets of rules (Bench-Capon et al., 2012). These are also known as rule-based expert systems. Significant contributions to AI and Law were introduced in 1989 with the concept of Isomorphism. Bench-Capon, (1989) and Nwosisi, (2015) proposes that isomorphism is needed to accurately create a legal argument and decision-making engine. This means that deep conceptual models and normative reasoning would need to be used for a higher level adjudicator confronted with a case in which the law is not clear or easily interpreted. Rule-based expert systems could be used in conjunction for low-level adjudication where the law is based of hard rules e.g. administering welfare or routine decisions in the case of tax law. This concept would be used to develop systems based on argumentation theory.

At the same time, in-roads were being made into the interpretation of the law. AI systems cannot make decisions about the law unless it can analyse and understand legislation and regulations created by lawmakers. Branting (2013) discusses Edwina Rissland and David Skalak's work on interpreting statutory predicates where they emphasise the need to use rule-based reasoning (RBR) on top of case-based reasoning (CBR) (knowledge and alternative rules, based on prior cases of



precedential value). The reason for this is that critical terminology and concepts may not be encompassed in the describing statute or it may refer to unspoken qualifications or exceptions and thus, the lawyer may need to find clues to statutory meaning outside of the legislation by considering past applications of the rules or predicates. Saying this another way is that the extension of predicates in a model of legal meaning is subject to “lazy learning” which cannot be determined in advanced by a rule based system but can only take on new meaning as cases arise and are ruled upon (Branting, 2013)

Bench-Capon et al. (2012) discuss the continuation of Edwina Rissland and David Skalak’s work on interpretation of the law to the presentation of argumentations, the creation of strategies for creating arguments and the selection of the optimal strategy to facilitate the likelihood of being persuasive and successful. The strategies are based on whether the arguer has taken a pro or con stance on a legal rule and an initial determination of whether the rule has been met. The strategies present themselves as four options. The options are:

1. *Broadening Strategy* where the stance is pro and conditions are not met and widening of rule scope is proposed;
2. *Confirming the Hit Strategy* where the stance is pro, the conditions are met and it is proposed that the rule should be applied;
3. *Confirming the Miss Strategy* where the position is con and the conditions are not met and the rule should not apply to this condition; and finally
4. *Discrediting Strategy* where the stance is con, the conditions are met and the proposal is put forward that the rule should not apply to the current situation.

These arguments assist the tasks of analogising and distinguishing called primitives (Bench-Capon et al., 2012). The authors utilised these argument strategies and primitives into argument trees, which could be traversed to find an appropriate argument for a given situation. These decisions trees were the foundation for their CABARET system, which combined their Case Based Reasoning (CBR) and Rule Based Reasoning (RBR) argument strategy architecture into the first legal case argument software tool (Bench-Capon et al., 2012; Skalak & Rissland, 1991).

The first application of neural networks being used to make legal decisions was in 1993 by Trevor Bench Capon. The machine learning experiment was undertaken using a fictional situation of a welfare payment decision to a senior citizen visiting their spouse who was hospitalised. The neural

network was trained by a fictitious legal case knowledge base and was given conditions for making the decision where the couple had to be married, their capital resources should not exceed a fixed amount where men should be 65 or older while women could be 60 or older (Bench-Capon, 1993; Bench-Capon, 2012). Bench-Capon investigates two questions namely, (1) Can the neural network be trained to decide cases based on a given set of 2400 previously judged precedent cases? And (2) can the decisions proposed be justified in terms of the conditional constraints used to generate the cases? The result for the first question was a comprehensive 99% success rate, which suggested that neural networks were capable of producing successful classifications of cases in domains where the factors involved in the classification were unknown. The neural network did not fare as successfully for the second question as it used constraints from previous cases to make current decisions. Thus, the neural network did not combine past learning with present constraint conditions in Bench-Capons experiment.

Up until 2001, most of work in the field of AI and Law was concerned with interpreting cases and statutes for the purposes of argumentation and decision making (Bench-Capon et al., 2012). Jack Conrad and Daniel Dabney who at this juncture were working at West Group, began work with a co-ordinated pool of twelve expert attorney-editors with a combined 135 years' experience of legal editing to develop automated techniques that could enhance the human editorial process (Bench-Capon et al., 2012). The scientific aim underlying the experiment was to use legal-expert opinions to develop concept-related and format-related components of the content and structure of legal cases, as the hypothesis was that case law did not have a logical overall structure at the individual case or corpus level. The eventual outcome would be to provide a basis for AI tools, e.g. expert systems who could identify the components to aid in the case law editorial process (Bench-Capon et al., 2012; Conrad & Dabney, 2001). This work was the first cognitive approach to judicial opinion structure and would become the basis of modern AI case and contract analysis tools, as well as Technology Assisted Review (TAR) tools for the purposes of Legal Research.

Further inroads into areas of legal argumentation, legal research and case preparation also occurred in 2001, with the paper 'A machine learning approach to prior case retrieval' by (Al-Kofahi, Tyrrell, Vachher, & Jackson, 2001). Prior case retrieval was extremely important for all Case Based Reasoning related AI systems as it is the foundation of the argumentation and sense-making framework. The aim of the work was to assist legal editors perform the task of tracking and identifying historical relationships between case law documents. The system was called History

Assistant and used various AI techniques namely Natural Language Processing (NLP), information retrieval (IR) and machine learning (ML) to identify direct history (decisions impacting prior related cases) and indirect history (decisions which were declined to follow another opinion) in the appellate chain (Bench-Capon et al., 2012). The challenge with this task is that court judgments may have multiple prior cases in whole or in part in different courts, at different times, with the possibility of party names changing or being exceedingly ambiguous e.g. State versus Smith. In addition to this, the combinations of these three AI methods was pioneering along with the success parameter being set at between 97.9 – 99.2% retrieval and 60% precision accuracy (Bench-Capon et al., 2012). History Assistant proved to be a useful technology incubator which provided an underlying basis for further development in the field legal research and TAR (Bench-Capon et al., 2012).

Another contemporary application of AI in Law is the activity of Case Outcome Prediction which is the analysis of the case at hand, identifying the subject matter of the case, splitting the case into pro and con segments, retrieving prior case precedents and predicting an outcome based on these factors (Ashley & Brüninghaus, 2009). Brüninghaus and Ashley (2003) introduced Issue-Based Prediction (IBP) in their paper titled ‘Predicting outcomes of legal case-based arguments’. This solution was based on prior CBR and IBP solutions such as CABARET (Skalak & Rissland, 1991) and CATO (Aleven, 1997). The distinction being that while its ancestors would generate arguments and allow the user to decide what to accept, IBP would choose statistically between which side of the argument would win and thus predict the outcome of the case. IBP used “logical models” which was a hybrid of logical and/or tree-based categorisations to structure its reasoning into issues and would then use CBR techniques to resolve these issues (Brüninghaus & Ashley, 2003). The value and strengths of these issue resolutions were then propagated up to a decision-making engine which would evaluate the issue-value pairs and apply knock-out factors (factors which are extremely prejudicial to a decision based on rules or precedential case-law). The software would then predict an outcome for a pro or con argument or would abstain from a decision, which was very rare. The solution performed with an admirable correct prediction rate of over 90% accuracy which outperformed all contemporary machine learning algorithms of the time (Brüninghaus & Ashley, 2003).

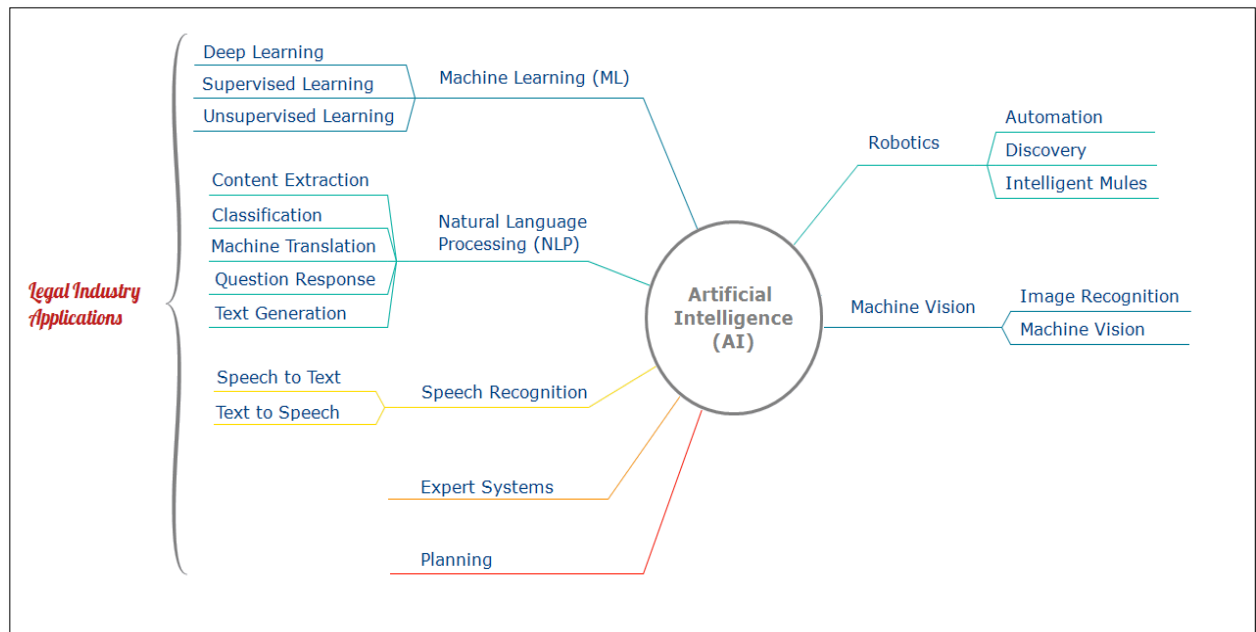
Legal text summarisation and sentiment analysis progressed forward in 2005 with Ben Hachey and Claire Grover’s paper on Automatic legal text summarisation “Experiments with summary

structuring” (Hachey & Grover, 2005). Their fundamental contribution to the AI and Law field was the introduction of machine learning techniques to the area of legal summarisations based on argumentative zones. A combination of machine learning models such as Supporter Vector Machines, Decision trees and Maximum Entropy Markov models bolstered by utilising linguistic annotation pipelines produced encouraging results with regards to legal text summarisation and sentiment analysis (Hachey & Grover, 2005). Ben Hachey and Claire Grover would go on to be cited by several future breakthroughs in the field of legal text summarisation such as the paper on Integrated access to legal literature through automated semantic classification (Francesconi & Peruginelli, 2009); LEXA: towards automatic legal citation classification (Galgani & Hoffmann, 2010) and Argumentation mining (Mochales & Moens, 2011).

The papers presented at the various International Conference of Artificial Intelligence and Law (ICAIL) conferences would become the foundations of many of the commercial AI solutions that are available to the legal industry today (Bench-Capon et al., 2012). What is, however, more important is that AI solutions today have been developed and honed over the last thirty years by computer and data scientists in conjunction with legal experts in a field which is not only bound by rules but by the outcome of case law which have ruled favourably or unfavourably to the rule.

### **2.3 The fields of study within the topic of AI and Law**

While AI has many fields of study as depicted by Figure 2.1, the most pertinent to the legal industry is Machine Learning (ML), Natural Language Processing (NLP), speech recognition, expert systems and to a lesser degree planning (Mills & Uebergang, 2017). The solutions investigated focus within the ML, NLP and expert systems fields of study producing products, services and insight within the tasks of legal research, contract analysis, online dispute resolution, document automation, e-discovery and case prediction.



**Figure 2.1 Fields of Artificial Intelligence with Applications in the field of Law**

Source: Adapted from (Mills, 2016)

Mills, (2016) covers a legal industry wide use of AI technologies. The following are summaries of his investigative work.

### 2.3.1 Legal Research

Legal Publishers and legal news correspondents like Thomson Reuters (TR) and Bloomberg BNA are using Expert System (EXSY.MI) - Cogito, which uses semantic enrichment technology and NLP to perform entity extraction, mining, categorize, enrich and make sense of their unstructured data (Mills, 2016). In 2016 ROSS Intelligence, ‘the world’s first AI attorney’ powered by IBM’s Watson AI platform, has been adopted by global law firms Dentons, Latham and Watkins and was deployed at New York law firm Baker and Hostetler to handle the law firm’s bankruptcy practice in 2016 (Mills, 2016). The AI System utilises NLP to understand written and spoken human language to provide legal based questions with inference drawn evidence-based answer, formulate hypotheses and continuously monitors the law and will notify the user of new court decisions or legislation passed that could affect your current case (Liberatore, 2017). The solution employs neural network and continues to improve the correctness and accuracy of its answers the more it is used. ROSS is providing a competitive edge to medium size law by providing cheaper and faster tools to lawyers for the purposes of legal research, as well as memo and legal document creation (Beck, 2016). Thomson Reuters (TR), publishers of Westlaw have also started collaborating with

IBM's Watson to create a compliance product to identify regulatory issues for the purposes of cross-border mergers and acquisitions (M&A) (Beck, 2016). Mills (2016) does however point out that it takes companies with vast resources, content and human capital such as TR over a year to train their AI systems to perform one expert task. This immediately creates a barrier to entry for smaller to medium sized law firms who cannot afford to assign such resources at adopting AI technology.

### **2.3.2 Contract Analysis**

One of the many responsibilities of general or legal counsel at law firms or corporates is that of contract analysis. The task sees the legal practitioners managing their company's risk and costs by understanding the rights and obligations of that company as stipulated in contracts and agreements. Thus, the legal counsel need to synthesise, draft and comment on legal contracts for a plethora of different purposes (Law Society of South Africa, 2017).

ML and NLP are being utilised by many vendors in various aspects of the contract lifecycle, including sentiment, regulatory and fiduciary analysis, discovery, highlighting, tagging and due diligence (Mills, 2016). Solutions available in the market using AI technologies include:

*Kira Systems* which provides features such as entity extraction, sentiment analysis and contract summarisation while boasting expediting the process of contract review for the purposes of due diligence in M&A by up to 60% based on machine learning. Seal Software traverses the clients networks to discover, analyses and reports upon what it finds, which adds a contract management capability onto its contract analysis feature set (Mills, 2016).

An international Law Firm, Reed Smith reviewed a deal previously conducted manually by human lawyers, with *RAVN's Applied Cognitive Engine* (Cabral, Chavan, Clarke, & Greacen, 2012). While the solution performed favourably, it did not produce 100% accuracy. What was encouraging was that the more lawyers trained it, the more it got the analysis correct. The solution performed the same tasks in minutes that humans performed in days (Mangan, 2017).

The surplus of contract analysis tools while not currently able to completely replace the role of general/legal counsel in law firms, however one can see how it could assist fewer legal practitioners achieve their goals a lot quicker.

### **2.3.3 Self-Service Compliance**

*Neota Logic* combines AI techniques of expert systems, NLP and machine learning, to provide fact- and context-specific answers to legal, regulatory compliance, policy and governance questions (Mills, 2016). In recent years, Self-Service Compliance has found applications in law in the form of legal-bots. A well-known example of a Legal-Bot is the DoNotPay bot which used AI techniques to help appeal over 160,000 parking tickets and approximately \$4 million in parking fines in just under two years in London and New York (Genova, 2016). The bot utilises ML and NLP techniques through an instant messenger chat-like interface where it works out whether an appeal is possible by asking several simple questions about the incident and visibility of any parking or warning signs. The AI solution then guides the users through the legal appeal process. The process for appealing fines in New York and London are defined by rules and is therefore perfect for AI systems to learn and give the suitable advice without the cost of lawyers' fees (Genova, 2016).

The same bot has been extended to simplify and automate the asylum seeking process. The bot automatically completes immigration applications for the United States, Canada and the UK, after asking users a series of questions to determine if they are eligible for asylum protection under international law (Bryant, 2017). Refugees also receive location specific submission instructions and get prompted for details of accompanying documentation (Bryant, 2017).

### **2.3.4 Case Outcome Prediction**

Rule based Reasoning (RBR) and its progeny Case Base Reasoning (CBR) has been the staple tenants for creating an artificial reasoning machine, which would have the capability to argue law, make judgments and predict case outcomes (Gardner, 1984; Loui, 2016; Stefanie & Kevin, 2003). In 2016 researchers from University College London (UCL), Sheffield University and Pennsylvania University created an outcome predictive system to evaluate cases heard at the European Court of Human Rights (ECHR). The problem statement was that out of 40,650 cases processed at the ECHR in 2015, only 2,441 received judgements, however many of these were joined making the total number of judgements delivered to be 823. This particular court was overextended with demands for hearings, many of which had no chance of winning leading to large costs and time to "wasted" cases. The purpose of this software to create a 'triage' system to provide judges with *a priori* cases. The system predicted within 79% accuracy the correct outcome of the 600 cases fed into the system. While the system is not meant to replace judges, it is a system

which could assist the judiciary in becoming more efficient in hearing ‘valid’ cases (Aletras, Tsarapatsanis, Preoțiu-Pietro, & Lampos, 2016).

Many commercial litigation prediction solutions use ML to predict case outcomes, which has immense competitive advantage effects on large law firms and on clients, which need to select lawyers who are most likely to win cases in a particular practice area of law. *LexPredict* has built models to predict the outcome of Supreme Court cases, at accuracy levels which surpass experienced Supreme Court legal experts (Mills, 2016). *Premonition* uses data mining and ML to present which attorneys win the most cases before specific judges, helping clients to make better choice on who to instruct (Mills & Uebergang, 2017). LexisNexis’s, Lex Machina mines litigation data from millions of pages of litigation to provide litigation predictive models based on the area of law, presiding judge and representative counsel (Mills, 2016). *Picture It Settled*, *Huron’s Sky Analytics*’ - *Legal Operations Company* and *Bloomberg Law’s - Litigation Analytics* perform similar tasks to help lawyers in their decision-making (Aletras et al., 2016; Mills, 2016)

Large teams of lawyers collaborating to defend or prosecute large civil claims are slowly becoming a picture of the past, technology assisted review (TAR), contract analysis, e-Discovery, legal research and case prediction can all be performed by a suite of AI tools which provide northward of 75% outcome prediction accuracy (Cormack & Grossman, 2014; Mills, 2016).

### **2.3.5 Technology Assisted Review (TAR)**

Legal Private Practice Firm, Winston and Strawn began a project in 2014 in collaboration with one of their large clients and the AI Technology Assisted Review (TAR) product called Equivio>Relevance (Cormack & Grossman, 2014). Equivio>Relevance software is an AI computer-based algorithm which can identify potentially responsive and relevant documents and discard any non-relevant documents. The project aimed to evaluate the potential cost savings and effectiveness of using AI technologies to assist in reviewing and analysing documentation for the purposes of case preparation. Predictive coding is the use of analysing, filtering and sampling to automate portions of an e-discovery document review. The purpose of predictive coding is to reduce the number of irrelevant and non-responsive documents that need to be reviewed manually by human experts (Cormack & Grossman, 2014).



The Winston and Strawn's study had the following objectives: (i) apply Equivio's predictive-coding technology to a set of Client documents that had been previously reviewed and coded for the Client by outside contract attorneys (the "Data Set"); (ii) estimated the approximate time and costs required to conduct a defensible TAR of those documents using Equivio's predictive coding for initial review and discarding and irrelevant documents; and (iii) compare the results of the predictive-coding process to those of a typical human review. The primary goal of the project was to complete an accurate predictive-coding analysis within the shortest time frame while requiring the least amount of human legal expert review as possible (Rosenthal, Timkovich & Cohen, 2014). The Data Set consisted of approximately 300,000 documents from a previously resolved pre-litigation matter in which contract attorneys reviewed the documents, coding them for relevance, privilege and importance. This work that human attorneys did in preparation for a litigation case was called the Human Review (Rosenthal et al., 2014). These same documents, along with the Human Review coding results, were provided to Winston and Strawn for the purpose of predictive coding using. The TAR tool identified 64 500 documents as potentially relevant (Rosenthal et al., 2014). The total time the TAR tool would need to review 2 151 (test set of documents), 64 500 potentially relevant documents and 22869 potentially irrelevant documents (i.e. 10% of the remaining 228 685 deemed irrelevant) would equate to 1 457 hours of work. It took human review efforts to review 293 185 document data set, approximately 4 886 hours. The outcome was that TAR tools was a viable option to reduce the time by approximately 70% of that of human effort and cost related to legal document review (Rosenthal et al., 2014).

As was denoted by Bench-Capon et al. (2012), the field of AI and Law is an ongoing endeavour and the progression of data storage, distributed cloud computing power and graph database technology will help the field achieve the ultimate goal of an artificial intelligent attorney at an exponential rate. The relevance of the literature reviewed up to this point denotes the maturity of the field of AI and Law. Subject matter experts within the field of AI and Law have collaborated for over 30 years to produce software that could assist in automating many of the tasks that lawyers fulfil in their roles. The commercial AI solutions summarised by Milles (2016) signifies that AI is capable of automating many legal functions, especially laborious repetitive tasks where much of the legal practioners time is needed. The literature reviewed was a catalyst to identify the problem statement of this study and to be the motivation behind investigating whether AI could have an impact on legal practitioners at law firms and legal publishers.

## **2.4 AI and Automation is not mature enough to replace lawyers**

There are many proponents of the idea that AI solutions will make the roles of lawyer's redundant viz. (Chui, Manyika, & Miremadi, 2016; McGinnis & Pearce, 2014; Nissan, 2015; Susskind & Susskind, 2015). Two recent studies propose that while the technology shows potential in automating some of the lawyer's functions, that it is not mature enough to completely replace the role of a lawyer in its entirety (Chui et al., 2015; Remus & Levy, 2015).

McKinsey Global Institute identifies the portion of work that has potential for automation using currently available technology in the legal profession is estimated at 69% of paralegal's job function and 23% of a lawyer's job. The predominant areas of automation or lack thereof was 100% for data processing; 73% for data collection; 0% for stakeholder interaction; 5% for applying expertise and 0% for managing other lawyers (Chui et al., 2015).

A study by Frank Levy at MIT and Dana Remus at University of North Carolina School of Law has analysed the potential for automation in legal services and places the figure for automating lawyers work at approximately 13%. Levy and Remus believe that tasks such as document review, case administration, document drafting, due diligence, legal research and legal analysis and strategy (which occupy 46% of a lawyer's time) could have a strong or moderate employment effect. A strong employment effect is defined as all or part of the task is automatable thus reducing 85% of a lawyer's time on this task and a moderate employment effect is defined as part of the task is automatable reducing the lawyer's time by 19%. They believe AI and automation technology is the least advanced in the areas of legal writing, advising clients, communications and interactions, factual investigation, negotiations, and court appearances. These tasks carry a combined weight total of 56% of a lawyer's work. They believe that these are tasks that entail largely unstructured work and as such there is limited opportunity for automation (Remus & Levy, 2015).

The literature reviewed above evaluates where AI software can perform a lawyer's job and where its current deficit capabilities are within the lawyer's job function. What is important to note is that the studies conducted largely focus on whether AI solutions are mature enough to replace lawyers. If one was to compare the tasks that AI is capable of automating as per (Chui et al., 2015) and (Remus & Levy, 2015) with the legal roles and duties Table 1.1, it becomes evident that a large amount of the work performed by legal practitioners such as paralegals, candidate attorneys, court stenographers, court translators and legal researchers, could be performed by AI. This further

fortifies the need investigate whether AI could have an impact on legal practitioners, with focus been directed towards the private sector of law firms and legal publishers.

## **2.5 Gaps in the literature**

While large law firms seem to be slowly adopting AI solutions to add value to their clients and provide quicker turnaround times in delivering legal advice and settling legal matters, the rest of the legal industry seems not to be following suit. Frey and Osborne (2013) conducted a study of the probability that computerisation could make certain occupations redundant. Out of 702 occupations evaluated, 47% were at risk of being made redundant through the use of automation and AI. Lower level positions like legal research and paralegals were amongst the positions that could be made redundant. However, attorney's days were not yet considered to be in danger of redundancy. The literature does not cover why law firms are not adopting AI technologies – whether it be from a lack of awareness or whether the technology is not yet affordable and if they have adopted AI technologies, whether they would see the need to reduce their legal professional staff component.

The literature also does not focus in depth on the tasks that AI cannot perform, why it cannot perform these tasks and what current endeavors are occurring to bridge this capability gap. The literature available tends to focus on attorneys and not other legal professionals such as paralegals, candidate attorneys and legal researchers where AI solutions could perform large portions of their jobs.

Lastly the reviewed literature does not convey what legal practitioners opinion's are on whether AI is worth investing in and whether given the opportunity, they or the companies for which they work, would invest in AI solutions to augment the companies capabilities, profitability and reduce their human resource head count. These gaps in the reviewed literature has provided the motivation for the objectives of this dissertation.

## **2.6 Theory Underpinning the Study: The Theory of Technological Unemployment**

The Theory of Technological Unemployment explores Karl Marx's hypotheses that capitalists are compelled by the objective laws of competition in a competitive market and the reduction of production costs by reducing labour to achieve profit maximization (Boianovsky & Trautwein, 2010; Yalinpala & Bibliothèque nationale du, 1983). The productivity of machinery is measured by the amount of living labour that it replaces and given a level of output, the new machine makes

it possible to reduce the number of workers employed and increases the output per worker. For the capitalist, the machinery merely provides a new type of investment for his capital, its immediate results, according to the assumption, is the dismissal of workers and the conversion of part of the variable capital into constant capital (Boianovsky & Trautwein, 2010; Marx, 1867; Neisser, 1942). Other firms must gradually adopt the new machinery in order to stay competitive, leading to greater adoption of the technology and less reliance on human workers. A side effect of the adoption of new technologies is the decrease in value of the human labour commodity and thus a reduction in the wage rate for that sector (Boianovsky & Trautwein, 2010)

To summarise, the Theory of Technological Unemployment refers to the adoption of new machinery or technology (independent variable) that yields higher output for a particular job function at a reduced cost of production that can lead to the displacement of human labour (dependent variable) in that particular market sector. The theory was developed in the late 19<sup>th</sup> century and was proposed at the height of the industrial revolution. There are, however, striking similarities with regards to the research objectives, which is to explore the relationship between the usage of AI solutions in law firms (which could be likened to machinery) and the effect it has on the propensity of law firms to hiring less legal practitioners (the displacement of labour described in the Theory of Technological Unemployment). A conceptual framework will have to be created to tailor the foundational theory to the objectives of the dissertation.

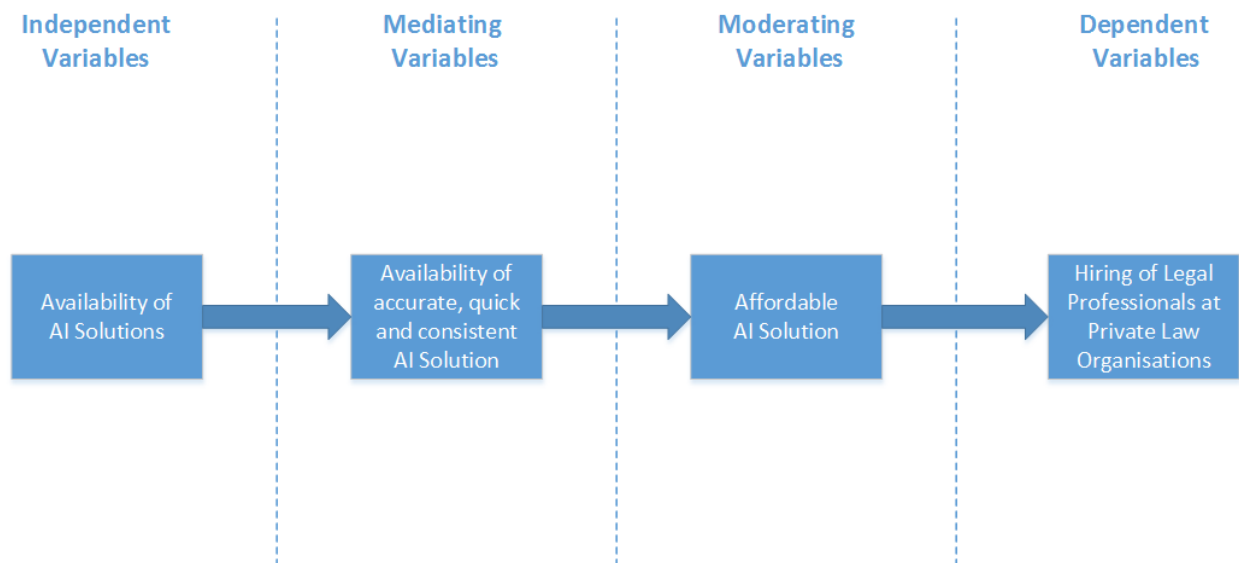
## **2.7 Conceptual Framework**

The Technological Unemployment Theory and neoclassical labour economics assume that labour is homogenous and that it is essentially a commodity (Prasch, Knoedler, & Champlin, 2003). Therefore, the conceptual framework for this study is grounded in the technological unemployment theory as it provides an economic device with which to consider employment relationships as commodities (Kaufman, 2010)

While the Theory of Technological Unemployment states that if, new machinery is adopted and yields higher output for a particular job function at a reduced cost of production then displacement of the labour in that particular market sector and job function is likely. In this case, the market sector is law firms and the conceptual framework will extend the original *independent variable* of new machinery to artificial intelligence solutions. The framework then tests the expected objectives of determining whether the availability of cost effective AI solutions (*moderating variable*) which yields a higher job performance output (*mediating variable*) would result in the

reduction in recruitment of legal professionals (*dependent variable*) in law firms and legal publishers.

The expected outcomes are that if there is sufficiently developed AI solutions that through economies of scale are more affordable than legal practitioners, can produce more output more efficiently and reliably than its human counterpart, then the Legal Firm or Legal Publisher would consider reducing the quantity of human legal practitioners being hired.



**Figure 2.2 Conceptual Framework for describing how the availability and affordability of AI will effect hiring practices of law firms of legal practitioners**

Source: Own compilation

## 2.8 Chapter Summary

The review of literature began its journey of the evaluation of current literature through to the identification of deficit information, which would ultimately provide the inspiration for conducting this study, with the introduction of the concept of AI and Law and how it was established over three decades ago at a conference called International Conference of AI and Law (ICAIL). This conference convenes the leading subject matter experts in the fields of AI and Law from academia and industry every two years. It depicted how AI and Law was a separate branch of AI and how its concepts and ideation helped to develop the field of classical AI. The review proceeded to elaborate on the various topics introduced at ICAIL and painted an antecedential picture of the foundation of the commercial AI solutions found in the legal industry today.

The review then continued to discuss current fields of studies in contemporary AI and which of these bears the most significant impact in the legal industry. The journey of review then presented several of the most important tasks within the legal professionals functions where AI solutions exists, namely legal research using eDiscovery; self-service compliance, case-outcome prediction and Technology Assisted Review (TAR) and described the combination of AI techniques used within each of these AI tools.

Each story has two sides and while the review to this point spoke of the current capabilities and success of AI in the legal industry, a counter-argument was made for those that disagree that lawyers are not yet superfluous. At this juncture, gaps in the literature were identified as why law firms are not adopting AI technologies – whether it be from a lack of awareness or whether the technology was not yet affordable and if they had adopted AI technologies, whether they saw the need to reduce their legal professional staff component.

The literature review then identified the theory which underpinned the study which was The Theory of Technological Unemployment which stated that advancement in productive technology would displace the need for human labour (Marx, 1867). The chapter concludes with the presentation of a conceptual model, which would become the driving influence behind this study. The following chapter describes the research design and methodology, which will be adopted for this research.

# **CHAPTER THREE**

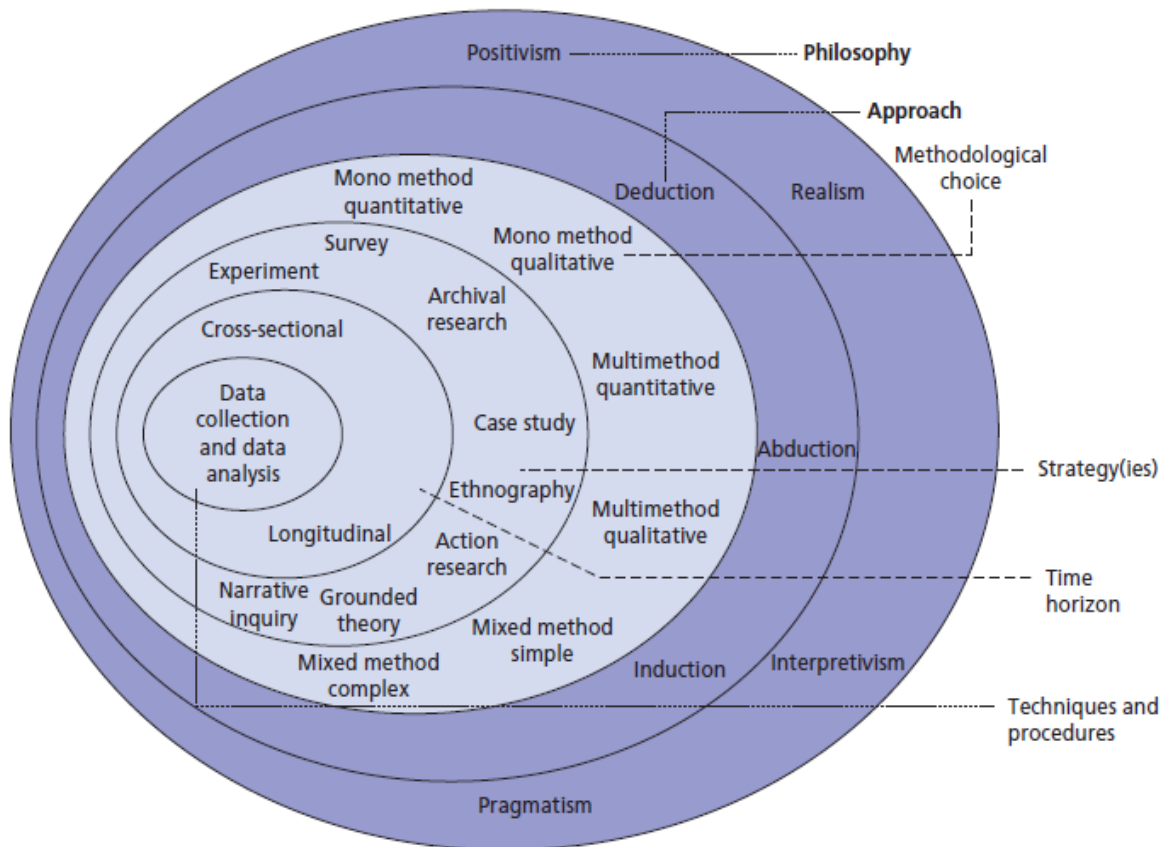
## **Research Methodology**

### **3.1 Introduction**

The literature review depicted a relationship between several variables which proposed that the awareness of advancements and availability of AI (independent variable) and the adoption of yield-producing AI solutions (mediating variable) which was cost effective (moderating variable) could cause a reduction in the hiring of legal professionals (dependent variable) in private law firms and legal publishers. This proposed relationship was depicted in a conceptual model in the previous chapter and will be used as the foundation for the appropriate research philosophy, approach, paradigm, design and methodology, which is presented in this chapter. This chapter explains the research methodology and methods selected to measure, describe and relate the research variables in a fashion to attempt to satisfy appropriate conclusions for the research questions. The chapter will also detail the research setting, the target population and the sampling technique utilised that would provide suitable inferences that could be applied to a broader population set. A research instrument was designed and presented which was self-administered to the respondent sample for the purposes of quantitative data collection from law firms and legal publishers. Statistical data analytical procedures are described and instrument reliability and validity are discussed. The chapter concludes with descriptions of good ethical practices that were adopted during the research.

### **3.2 The Research Process**

All research is planned in relation to a problem that needs to be solved and questions that need to be answered (Saunders, Lewis, & Thornhill, 2016). However, according to Saunders et al. (2016), the research instruments and the data that researchers wish to collect resides in centre of the research ‘onion’ presented in Fig 3.1. This research utilised the research ‘onion’ to describe the various layers of the research process, the options available to the researcher and why each choice was selected with the final outcome of converging on data collection and analysis techniques to answer the research questions proposed in Chapter 1.



**Figure 3.1 Research ‘Onion’**

Source: Adapted from (Saunders et al., 2016, p. 164)

### 3.3 Research Philosophy

Research Philosophy refers to the system of beliefs and research assumptions used to develop a current body of knowledge by underpinning appropriate choices of research methodologies, strategies and data collection techniques (Saunders et al., 2016). Research paradigms are driven by three research assumptions namely the *ontology* (the nature of reality or being), *epistemology* (the study of acceptable, legitimate knowledge and how knowledge is communicated), *axiology* (the role of ethics and values in the research process) (Saunders et al., 2016, p. 127). These assumptions combine to provide the five major philosophies in business and management research namely positivism, critical realism, interpretivism, postmodernism and pragmatism (Saunders et al., 2016)



### 3.3.1 Positivism

Saunders et al. (2016) espouse that Positivism entails working with observable facts and law-like generalisations. *Ontologically*, there is agreed to be one true factual reality, while *epistemologically*, knowledge is achievable by scientific method and facts are observable and measurable (Gill & Johnson, 2010). There is a cause and effect nature to knowledge and prediction via hypothesis is prevalent. *Axiologically*, the research is value-free and objective and the researcher is detached, neutral and independent of what is researched. Thus, the researcher's opinion and beliefs do not influence the research (Gill & Johnson, 2010).

### 3.3.2 Critical Realism

Critical Realism proposes that reality is external and independent, but truth is based on historical experiences and driven by the senses i.e. how people perceive the world around them and events in which they partake (Saunders et al., 2016). Reed (2005) discusses the philosophy as *ontologically*, there is layered nature of being meaning, what we experience is empirical through our senses and are manifestations of things we see in the real world. *Epistemologically*, however, different people's perceptions of reality is different to each other and thus, there cannot be an absolute truth (Reed, 2005). Facts are created through social and cultural constructs, historical truths and societal norms. *Axiologically*, this provides the philosophy with value-laden research. The researcher acknowledges bias by worldviews, cultural experience and tries to minimize bias and errors (Reed, 2005).

### 3.3.3 Interpretivism

Interpretivism celebrates humanities complexity and espouses that meaning cannot be determined as it does with physical phenomena (Saunders et al., 2016). *Ontologically* the nature of reality is complex and rich, socially constructed through culture and language with there being multiple meanings and interpretations to events, occurrences or objects (Saunders et al., 2016). *Epistemologically*, knowledge is constructed from narratives, language, stories, perceptions and interpretations (Bryman & Bell, 2015). *Axiologically*, Interpretivism depicts value-bound research, where the researcher is part of what is researched and their subjective interpretations are key to the contribution to the study (Saunders et al., 2016)

### 3.3.4 Postmodernism

Saunders et al. (2016) articulate that Postmodernism emphasises the role of language and of power relations, which shape accepted ways of thinking. This philosophy extends on from Interpretivism where the *Ontology* presents a complex and rich nature of reality but suggests that power relations adds to the meanings, interpretations, realities and can also remove from them. An example is the popular euphemism that “history is written by the victor”. *Epistemologically*, what counts as truth and knowledge is decided by dominant ideologies based on the current power relations (Saunders et al., 2016). *Axiologically*, this philosophy presents value-constituted research where the researcher and the research are embedded in power relations which has the characteristics of some narratives being silence at the expense of others (Calás & Smircich, 1997).

### 3.3.5 Pragmatism

Pragmatism affirms that reality concepts are only relevant where they support action and as such *Ontologically*, reality is the practical consequence of actions i.e. truth is what works at the time (Saunders et al., 2016). *Epistemologically*, this philosophy does not rely on antecedents. It focuses on problems, practices and relevance while *Axiologically*, this philosophy asserts value-driven research where the research which is initiated and sustained by the researchers doubts and beliefs (Creswell, 2013, p. 10). This approach often relies upon on utilising multiple techniques or mixed methods for collecting data in order to overcome the inadequacies of adopting traditional singular methods.

### 3.3.6 The research philosophy selected for the study

The examination and analysis of the philosophies available for conducting research has presented several options through the concept of the research ‘onion’ as a foundation for this research study. The dissertation was based on a conceptual framework which was grounded in theory, which aimed to investigate a causal relationship between the availability of AI and whether it impacts on the hiring of legal professionals. The need for the researcher to be detached, neutral and independent of the research topic while conducting value-free research lead the researcher to believe that a *Positivist philosophy needed to be adopted*.

### **3.4 Research Approaches**

Research approaches present themselves in three forms viz. deductive, inductive and abductive approaches. Each of these approaches will be examined and a suitable approach for this research will be selected based on their risks and benefits.

#### **3.4.1 Deductive Approach**

The deductive approach is entrenched in existing theory where conclusions are derived from a set of propositions and is explanatory in nature. The conclusion being true when all the propositions are deemed true (Saunders et al., 2016). According to Bryman and Bell (2015) a deductive approach utilises the following process; (1) a problem is identified (2) literature is critically reviewed and its foundational theory is identified (3) existing literature is used to formulate a set of hypotheses or propositions (4) appropriate data collection and analysis techniques are selected; thereafter data is collected (5) the findings are analysed and interpreted (6) the hypotheses or propositions are confirmed or rejected (7) the theory either holds true, fails or is augmented and as such strengthens or weakens the body of knowledge. Thus, deductive approaches progress from the availability of theory to data collection and is often associated with a quantitative research approach (Bryman & Bell, 2015)

The advantages of a deductive approach are:

- based on existing or parallel body of knowledge
- require less time than inductive and abductive approaches due to data collection only requiring one phase
- research time schedules can be predicted more accurately
- has a lower risk of non-returning of questionnaires

The disadvantages of a deductive approach are:

- does not support new topics of investigations
- there may not be enough context around the data collected, therefore the study may reveal what is happening but not why it is happening
- it does not lend itself to theory generation
- a large number of sample of subjects is required

### 3.4.2 Inductive Approach

The inductive approach is the converse of a deductive approach in that data is collected to explore an existing phenomenon and thereafter is used to construct theory (Saunders et al., 2016). The inductive approach is exploratory in nature as opposed to the deductive approach, which is explanatory in nature. Bryman and Bell (2015) propose that the process of an inductive approach is; (1) collect data relating to a phenomenon through in-depth qualitative interview (2) analyse data and extract themes resulting in variables (3) propose a relationships between these variables via a conceptual framework.

The advantages of an inductive approach are:

- smaller sample of subjects is required
- facilitates investigation into topics that are new
- provides richer explanations of why a phenomenon is occurring

The disadvantages of an inductive approach are:

- run the risk that beneficial patterns and theory may not emerge
- takes longer to retrieve information as qualitative data gathering often rely on the researcher having one on one time scheduled for each sample subject
- Often results in multiple passes of data collection to ascertain proper meaning

### 3.4.3 Abductive Approach

The abductive approach is an amalgamation of deductive and inductive approaches, where the researcher collects data to explore a phenomenon, classify themes and expound upon patterns to create new or modify existing theory through a conceptual framework, which is exposed to supplementary testing through an additional data collection process (Saunders et al., 2016). This approach bares similar risks and benefits to the inductive approach. An added benefit is that the theory constructed goes through a process of verification, which is not a phase of the inductive process.

### 3.4.4 The research approach selected for the study

The various approaches to research were considered and after weighing up their advantages and disadvantages, the researcher selected a *deductive approach* to determine whether the availability of affordable capable, yield-producing AI software would result in less legal professionals being

hired in the private law and legal publishing industries. This approach also seemed suitable as there exists theoretical backing in the form of the theory of technological unemployment, which formed the underpinning of this study. Research propositions were created to determine relationship between several variables which proposed that the awareness of advancements and availability of AI (independent variable) and the adoption of capable, yield-producing AI solutions (mediating variable) which was cost effective (moderating variable) could cause a reduction in the hiring of legal professionals (dependent variable) in private law firms and legal publishers. Due to time constraints for gathering data for the purposes of this research, the deductive approach using quantitative methods once again made sense as the approach of choice.

### **3.5 Research Methodological Choices**

The three main methodological choices are quantitative, qualitative and mixed methods research design (Saunders et al., 2016).

#### **3.5.1 Quantitative Research**

Quantitative research is usually but not exclusively associated with positivist philosophies and deductive approaches which utilises data collected from sample subjects to test a theory (Saunders et al., 2016). Characteristics of quantitative research is the examination of relationships between variables, which are measured through numerical methods and analysed through statistical methods (Bryman & Bell, 2015). The researcher is purported to be independent from the subjects being researched and single (mono method quantitative study) or multiple (multi-method quantitative study) data collection techniques can be utilised to collect research data. This type of research is usually associated with experimental or survey research strategies (Saunders et al., 2016).

#### **3.5.2 Qualitative Research**

Qualitative research is usually but not exclusively associated with interpretivist philosophies and inductive approaches where data is first collected from sample subjects, themes categorised, variables and their relationships are defined to build a theory via a conceptual model (Saunders et al., 2016). Characteristics of qualitative research is the examination of the respondents' outlooks and the relationships between them which are interpreted through non-numerical data (Bryman & Bell, 2015). The researcher is expected to gain physical access to the respondents and needs to build rapport with them, which may result in the researcher's perspective influencing the

respondent. This research design may use single (mono-method qualitative study) or multiple (multi-method qualitative study) data collection techniques to collect research data. This type of research is usually associated with the following strategies viz. action, case study, grounded theory and narrative research (Saunders et al., 2016).

### **3.5.3 Mixed Methods Research**

This type of research utilises both quantitative and qualitative research methods to truly understand the phenomenon being studied, or the theory that is being verified. The two methods could be (1) concurrent (quantitative and qualitative run in parallel), (2) sequential exploratory (qualitative methods are followed by quantitative methods), (3) sequential explanatory (quantitative methods are followed by qualitative methods), (4) sequential multi-phase (iterative phases of quantitative and qualitative methods) (Saunders et al., 2016). While this method allows the researcher to understand how and why relationships exist between variables, the time-frames required to complete a mixed method design did not lend itself to the cross-sectional nature of a MBA research. As such, it was not considered as a viable option for the research methodology.

### **3.5.4 The research methods selected for this study**

Prior positivist philosophy and deductive approach choices, as well as the research having the need to test theory from the collection of data from sample subjects, while assuring that the researcher remains detached and objective from the respondents being researched has led the researcher to select a quantitative research methodology. The added time constraint placed upon the researcher to complete the study has steered the researcher to adopt a *mono-method quantitative study*.

## **3.6 The Research Strategy**

The research strategy is defined as the plan of how data will be gathered for the express purpose of answering the studies research questions (Saunders et al., 2016). Further to this a research design utilises the research strategy to investigate the causes of the research problem by providing justification for the choice of techniques, collection methods, instruments and analytical techniques (Saunders et al., 2016) Common strategies available to the researcher are:

- Experimental
- Survey
- Archival
- Ethnography

- Action Research
- Grounded Theory
- Narrative Inquiry

### **3.6.1 Experimental**

Classical experimental strategy is characterised by manipulating an independent variable in order to determine a causal effect on the dependent variable (Saunders et al., 2016). It commences by establishing two groups viz. a treatment group and a control group. The treatment group is manipulated and compared against the control group which is not manipulated (Bryman & Bell, 2015). The dependent variable is measured before and after the independent variable is manipulated to determine change. Experiments use predictions or hypotheses instead of research questions due to the researcher anticipating the existence of a relationship or lack thereof between the variables (Saunders et al., 2016).

### **3.6.2 Survey**

The survey strategy is normally associated with deductive research approaches and tends to be used for exploratory and descriptive research by collecting quantitative data which is subjected to analysis using descriptive and inferential statistics (Saunders et al., 2016). Another characteristic of survey strategies is the use of probability sampling techniques to draw a sample out of a population when the entire population is too large to study (Creswell, 2013). Data collected can be used to describe relationships between variables and can assist in producing conceptual models of these relationships using numerically based explanations.

### **3.6.3 Archival**

Archival research strategies are characterised by utilising secondary data from public and private archives for the purposes of data collection (Saunders et al., 2016). Many of these sources are found in online archives due to the proliferation of the internet. These documents are considered secondary sources as they were created for purposes other than how they are currently used (Saunders et al., 2016). Secondary data can take the form of:

- Communications e.g. e-mails, letters or blog postings
- Personal records e.g. diaries or notes
- Organisational sources e.g. contracts, meeting minutes, memos, press releases, strategy documents

- Government sources e.g. Publications, law reports, national statistics
- Media sources e.g. articles, audio recordings, photographs, video recordings

According to Saunders et al. (2016) archival strategies can be used for qualitative or quantitative research.

#### **3.6.4 Ethnography**

Ethnographic studies is qualitative research where the researcher studies behaviours, actions and language of a people or cultural group in their natural surrounding over a protracted period of time. Data collection often takes the form of observations or personal interviews (Creswell, 2013).

#### **3.6.5 Action Research**

Action research is an iterative process of analysis that is intended to develop solutions for organisational problems through diagnosing issues, planning action, taking action and evaluating the results (Saunders et al., 2016). The solutions are implemented and thereafter re-evaluated to determine their impact on the organisation. Therefore, action research is a practical approach to resolving organisational issues in the shortest period.

#### **3.6.6 Grounded Theory**

Grounded theory is a set of procedures to develop an inductively derived theory from data to explain human behaviours or social phenomena. Data is iteratively compared against other data collected until a theory emerges and thereafter compares new data with the emerged theory (Sekaran & Bougie, 2016). Creswell (2013) supports this view by adding that grounded theory research requires multiple sources of data collection, analyses and refinement in the process of developing theory. Grounded theory adopts an inductive approach while using observations and interviews as the data gathering mechanisms.

#### **3.6.7 Narrative**

Narrative research adopts an inductive approach using qualitative methods where the researcher studies the lives of the participants especially that of their experiences, narrated in a sequential manner which depicts a story of related events in a way that conveys meaning to the researcher (Saunders et al., 2016).



### **3.6.8 The research strategy selected for this research**

The research ‘onion’ technique has helped to narrow the research design to utilising a deductive approach with quantitative methodological choice, which is explanatory in nature. The research objective of finding out whether the availability of capable, affordable, yield-producing AI software will result in the reduction of hiring legal professionals explains causal relationship, which needs to be observed and reported on. The fact that the methodological choice is quantitative steers the research design to collect numerical data. Furthermore, the sample population of legal professionals is too large to study and as such, a representative sample would need to be drawn to conduct the research. All of these factors has contributed to *survey strategy* being selected to support this research

### **3.7 Time Horizon**

The research time horizon can either be a cross-sectional study which is a snapshot of a phenomena at a particular time or it could be a longitudinal study which is the study of the phenomena over an extended period of time (Saunders et al., 2016). Time-frames are often governed by the type of research being conducted.

#### **3.7.1 Cross-sectional Studies**

A cross-sectional study is characterised by the data collection phase of the research being conducted for a reduced period at a point in time with the purpose of answering the research questions. These studies often utilise (but are not exclusive to) survey strategies (Saunders et al., 2016).

#### **3.7.2 Longitudinal Studies**

Longitudinal studies is described as research that requires data collection to occur over several points in time. Its main strength is that it offers the capability to study change and development of a phenomenon over longer periods of time (Saunders et al., 2016). Although these types are studies are normally associated with studies which require longer time frames, they can also be employed with research that has time constraints through the use of Archival strategies where large amounts of time-series data has been collected, catalogued and stored in data archives.

### **3.7.3 The time-horizon selected for this research**

A *cross-section study* was selected due to the time constraints associated with the MBA program, the prior choices of selecting survey strategies and the lack of archival data to assist with answering the research questions.

### **3.8 Research Design**

Saunders et al. (2016, p. 726) describes a research design as a “framework for the collection and analysis of data to answer research question and meet research objectives providing reasoned justification for choice of data sources, collection methods and analysis techniques”.

In summary, due to the causality relationship being studied, the study use a cross-sectional descriptive survey design which will be explanatory in nature using quantitative methods to gather and validate the data. Quantitative data will be collected and will be used to determine the relationship between the usage of AI solutions in law firms and the effect it has on law firms hiring of legal practitioners.

Advantages and disadvantages to this research design is as follows:

#### **Advantages**

- The research produced data based on real world observations (empirical data).
- The methodology was perfect to test a possible theory
- Questionnaires could produce a large amount of data in a short time at a fairly low cost.

#### **Disadvantages**

- This methodology is not suited to exploring concepts where no antecedents are available
- The data produced could lack depth of insight on the topic being investigated.
- Securing a high response rate to a questionnaire was difficult

### **3.9 Research Setting**

The total population of law professionals are employed in the private sector such as private law firms and legal publishers as well as the public sector which include the Department of Justice & Constitutional Development, the National Prosecuting Authority, and the Judiciary and in court administration. This population would be too large a target population to study given the time constraint associated with completing a MBA dissertation. Therefore, the target population for this

study focused on the private sector with legal publishers, law firms and legal departments within private firms and private advocates. Legal publishers are companies who hire university graduates or admitted attorneys to produce and edit legal documents and manuscripts. Law firms are companies which employ at least 1 or more Fee Earners and private advocates are specialist lawyers who are allowed to represent clients in a court of law in South Africa. A Fee Earner is a lawyer who takes on cases and earns revenue for a law firm (Forstenlechner, Lettice, & Tschida, 2008). The sample frame was employees of these types of organisation regardless of their seniority within the firm. Most law firms have branches in the major metropolitan areas. Therefore, all questionnaires will be conducted in Durban, KwaZulu-Natal.

### **3.10 Sampling Techniques**

Sampling is the process of collecting data from a subset of the total population that has characteristics which represent the total population (Creswell, 2013). Sampling provides a viable mechanism for collecting data when it would be impractical to survey the entire population and budgetary or time constraints prevent the entire population to be surveyed (Saunders et al., 2016, p. 274). There are two types of sampling namely Probability sampling and Non-probability sampling which will be discussed below.

#### **3.10.1 Probability Sampling**

This type of sampling occurs when the elements of a population have a known, non-zero probability of being selected as sample subjects (Sekaran & Bougie, 2016). A characteristic of this type of sampling is the need for statistical inference to be drawn from the sample frame, as the entire population cannot be surveyed to answer ones research questions (Saunders et al., 2016). There are several common types of probability sampling namely simple random sampling, systematic random sampling, stratified sampling and cluster sampling.

##### **3.10.1.1 Simple Random Sampling**

Simple random sampling is characterised by every element in the population having a known and equal chance of being selected as a subject and involves selecting the sample at random from the sample (Saunders et al., 2016). This is achieved by labelling each case in the sampling frame with a unique number and then selecting these cases from a random number generator until the required sample size is achieved.

*Benefits* of using this sampling mechanism are low levels of bias in selecting the sample and high levels of reliability while make certain that the sample is representative of the target population (Bryman & Bell, 2015). This sampling method is best utilised when the target population is known and can be uniquely referenced.

*Drawbacks* of this sampling mechanism is the lead-time needed to prepare and catalogue each possible participant for the purposes of randomly selecting the sample frame. The process is time consuming and not viable if the target population list is not available (Sekaran & Bougie, 2016). This technique is not suitable for collecting face to face data over a geographically dispersed area, due to high travel costs (Saunders et al., 2016).

#### 3.10.1.2 Systematic Random Sampling

Systematic random sampling is similar to simple random sampling with the difference being that samples are selected at regular intervals after an initial random sample (Sekaran & Bougie, 2016). This is achieved by labelling each case in the sampling frame with a unique number and then selecting the first cases from a random number generator and thereafter a sampling fraction is calculated (Saunders et al., 2016)

$$\text{Sampling fraction} = \frac{\text{actual sample size}}{\text{total population}}$$

An example of this would be if you selected a sample of 20 respondents from a total target population of 100 possible participants, then the researcher would select one subject in every group of  $(20/100 = 0.2)$  which translates into every 5 subjects until the sample size is selected.

The benefits and drawbacks are similar to that of simple random sampling with the only caveat being that the sampling selection introduces slightly more bias with regards to selecting the sampling set.

#### 3.10.1.3 Stratified Random Sampling

Stratified sampling sees the sample frame being divided into significant mutually exclusive sub-groups that is relevant to the study (Saunders et al., 2016). Each strata is proportionally representative of the target population and then the research draws a sample from the sub-groups via simple random or systematic sampling until the sample size is achieved (Bryman & Bell, 2015).

According to Saunders et al., (2016), the following process is needed for stratified random sampling (1) select the stratification variables (2) separate the sampling frame into discrete strata (3) follow simple random or systematic sampling techniques on each strata.

*Benefits* of this technique are low selection bias and higher and more discernible rates of target population representation.

*Drawbacks* of this technique is that it is more time consuming than simple random sampling and as such more expensive to conduct. The strata need to be significantly distinguishable in the sampling frame, which also needs to be known beforehand.

#### 3.10.1.4 Cluster Random Sampling

Cluster sampling divides the target population into discrete groups or clusters and the clusters are selected via simple random sampling (Saunders et al., 2016). The difference between this sampling technique and stratified sampling is that the sampling frame is the entire catalogue of clusters versus the entire catalogue of individual cases within the population. According to Saunders et al. (2016) the cluster sampling technique is achieved by (1) selecting the cluster combination for the sampling frame (2) uniquely number each cluster (3) use random sampling to select the sample of clusters.

*Benefits* of this technique is that it saves time to determining the sample frame.

*Drawbacks* of this technique is that the sample is a less representative of the target population than in the stratified sampling technique.

#### 3.10.1.5 Multi-stage Sampling

Multi-stage sampling is also known as multi-stage cluster sampling and is an expansion of classical cluster random sampling and is used to overcome problems of geographical dispersion of the target population when one-on-one contact is essential or in a situation where it is costly and time-consuming to build a sampling frame for an expansive geographical area (Saunders et al., 2016). This technique offers quicker determination of the sample but like cluster random sample, is inaccurate when it comes to reconciling the sample and target population representations.

### **3.10.2 Non-probability Sampling**

According to Sekaran & Bougie (2016) non-probability sampling provide alternative sampling techniques that include subjective judgement where the elements in a target population do not have a known probability of being select as subjects. Case studies, market surveys and other qualitative research methodologies are research strategies that can use non-probability sampling techniques to create their samples (Bryman & Bell, 2015). Common types include Quota sampling, Purposive sampling and Convenience sampling.

#### **3.10.2.1 Quota Sampling**

Quota sampling is a non-random sampling technique is often used for structured questionnaires or interviews as part of a survey strategy (Saunders et al., 2016). Barnett (2002, cited in Saunders et al., 2016) describes quota sampling as similar to stratified sampling where the target population is split into strata and quotas are calculated for each group with non-random selection criteria in order to achieve the sample. The process to select a quota sample is to (1) divide the population into strata (2) calculate a quota for each group based on available or relevant information (3) instruct each interviewer to collect data with a set amount of cases within the quota (4) consolidate all data collected from the interviewers to provide the final sample.

*Benefits* of Quota sampling is that is less costly and can be performed quicker than probability sampling techniques (Bryman & Bell, 2015). It does not require a sampling frame and as such is the only technique that can be employed if a sampling frame is unavailable.

*Drawbacks* of Quota sampling is that it often requires a large sample size. The absence of relevant and sensible quotas may present bias in the data collected. The freedom of interviewer selection within the boundaries of their quota also lends itself to bias, due them most likely only selecting respondents who are accessible or willing to the answer the surveys. Levels of certainty or margins of error cannot be measured due to the sample not being probability based (Saunders et al., 2016).

#### **3.10.2.2 Purposive Sampling**

Purposive sampling requires the researcher to use their judgment to select samples non-randomly with the purpose of answering the research questions and achieving the objectives of the study (Saunders et al., 2016). It is often employed in situations where there are small samples e.g. case study research and the researcher wishes to select cases, which are particularly interesting.

*Benefits* of Purposive sampling is that the researcher can hone in on extreme cases where they know they will attain the most knowledge. Additional benefits are that the sample can be attained extremely quickly with low costs.

*Drawbacks* of Purposive sampling is that the samples cannot be representative of the target population. There is possible opportunity for extreme bias in selecting the sample.

#### 3.10.2.3 Snowball Sampling

Snowball sampling is a non-random sampling technique when it is difficult to identify members of a particular population (Bryman & Bell, 2015). The process to attain the sample is to (1) identify a member of the group that needs to be studied (2) ask for referrals (3) ask referrals for referrals until the process snowballs with the result of the final sample size being reached or when no new cases can be identified (Saunders et al., 2016).

*Benefits* to Snowball sampling is that research can continue without a sample frame being identified. It is the only option for populations that are difficult to identify.

*Drawbacks* to Snowball sampling is that it may be hard to identify the first participant. Participants may not want to refer the researcher to new cases. Sample bias is large problem due to participants selecting like-minded people with the same attitude and perspective to participate in the research (Saunders et al., 2016).

#### 3.10.2.4 Convenience Sampling

Bryman and Bell (2015) describe Convenience sampling a non-random technique, which involves selecting cases for the research sample based on the ease of acquisition. Saunders et al. (2016) contributes to this description of technique by adding that the researcher selects respondents based on their availability and willingness to participate in the research until the sample size is achieved.

*Benefits* of Convenience sampling is the rapid attainment and processing of research subjects while reducing costs.

*Drawbacks* of Convenience sampling is that it is prone to biases and influences out of the control of the researcher. This type of sampling is also considered the least credible sampling technique out of the portfolio of techniques and is not representative of the target population (Saunders et al., 2016).

### **3.10.3 Sampling Technique selected for this research**

The sampling technique selected was a result of several factors surrounding the nature of the research, the target population, their geographical dispersion, time-frames allotted by the MBA program, access to the respondents and willingness of the respondents to participate. The target population was legal professions in private law firms, legal publishes, legal departments in private companies and private advocates. The primary challenge with this target population is that there is no one body or organisation which has a register of every legal professional practicing law and which companies they currently work for. As a result, there is no fully representative sample frame from which to select the sample. This immediately excludes probability sampling techniques as a means of selecting a sample and therefore narrows the option of techniques to those available in non-probability techniques (Saunders et al., 2016).

While various strata were recognised within the target population such as gender, age and job titles, there were no quota variables available to proportionally represent the population and as such, quota sampling was excluded as a sampling mechanism. Access to businesses and legal professionals using the LexisNexis Law Diary publication was a limitation considered before the respondents and data collection commenced, however this proved to be more difficult than originally envisioned and soon became a roadblock as many firms and individuals declined to take part in the study.

The unavailability of a list of respondents within private law, accessibility and respondents' willingness to participate in the study, geographical dispersion of the companies, time constraints of the MBA program, ease of use and cost effectiveness considerations led the researcher to converge on snowball sampling as the sampling technique of choice to complete the research. As is discussed in '3.10.2.3 Snowball Sampling', the main drawback was trying to find the first respondent in each company and making sure that they could get enough referrals to reach a sample which could produce adequate analytical data to answer the research questions. This could only be overcome by utilising industry and personal relationships to attain 'entry' into these organisations. The second drawback of snowball sampling was the introduction of large possible bias being produced by each referrer only finding like-minded individuals who shared the same belief or were part of the same strata e.g. legal secretaries only sharing the survey with other legal secretaries resulting in a homogenous sample representation and mind-set. This was managed by making sure that the researcher was made aware of each referral and subsequently sending personalised e-mails



explaining the research through either description or infographical information and the need for as many job profiles to participate in the research as possible. The job profiles requested were:

1. Executive or Directors
2. Firm Partner
3. Attorney and/or Fee Earner
4. Candidate Attorney
5. Company Secretary
6. Para-legal
7. Legal Researcher
8. Editor
9. Managing Researcher

### **3.11 Sampling Size**

According to Saunders et al. (2016) the issues of sample size is ambiguous and without rules for non-probability sampling techniques besides quota sampling. Patton (2002, cited in Saunders et al., 2016) espouses that the sample size for non-probability sampling is dependent on the research questions and objective, what data will be of use, what will have credibility given the available resource constraints. Saunders et al. (2016) summarises the minimum non-probability sample size for studies considering a heterogeneous population to be between twelve and thirty cases (12–30).

The outcome of the snowball sampling process was that after 8 weeks of distribution and follow-up, 102 questionnaires was completed by legal professionals covering the entire job profiles listed above, from 19 separate organisations representing private law firms, legal publishers, private advocates and legal departments in private corporates. All 102 questionnaires were filled in correctly with 8 being returned too late or not being completed at all, thus constituting 92.7% response rate.

### **3.12 Data Collection**

#### **3.12.1 The Research Instrument**

There are several methods for collecting data for studies namely, examination of secondary sources, observation, semi-structured or unstructured interviews and surveys or questionnaires. Questionnaires tend to provide the best method of data collection for explanatory research where causal relationships between variables need to be investigated (Saunders et al., 2016).

According to Sekaran and Bougie (2016), questionnaires can take the forms of personally administered questionnaires or self-administered questionnaires which can be distributed by mail, via online survey platforms or via delivery and collection mechanisms. Due to the nature of the study, a questionnaire appeared to be the most appropriate method for determining the relationship between the usage of AI solutions in law firms and the effect it could have on the propensity of law firms hiring less legal practitioners.

The data collection instrument for the study was chosen to be a self-administered structured questionnaire. The questionnaire originally adopted a hard copy/printed survey format which was hand delivered and collected with the intended the face to face natured relationship that the researcher had with customers and colleagues. This soon proved onerous due to unavailability of legal professionals, cancelled meetings and geographical dispersion. The hard copy server was then converted to fillable word document and e-mailed to prospective participants. This technique proved to be more amenable to legal professionals who value their time, given that it is a commodity upon which they make their living.

The questionnaire covered the following sections:

- **Demographic Information – 2 Questions – (1, 2)**
  - These question help to identify ages and gender to draw conclusions if there are any predisposition to adopting AI solutions
- **Company Type, Job Roles and Job Functions – 4 Questions – (3, 4, 5, 6)**
  - These questions help identify the type of companies the legal professionals work in, what their job roles are and what job function these company perform
- **Awareness of Artificial Intelligence in Law – 2 Questions – (7.1, 7.2)**
  - These questions were used to satisfy the first research objective, which was to ascertain if employees at law firms and legal publishers are aware of advancements of AI in the legal industry.
- **Utilisation of Artificial Intelligence Solutions – At Present – 2 Questions – (8.1, 8.2)**
  - These questions are to uncover whether the respondent either uses AI technology at present or is aware of AI solutions being used in their law firms
- **Utilisation of Artificial Intelligence Solutions – Capability – 1 Question – (9)**

- These questions were used to satisfy the second research objective what was: To determine if there is a perception that law firms and legal publishers would use AI if it was accurate, quick and consistent to use.
- **Utilisation of Artificial Intelligence Solutions – Affordability – 1 Question – (10)**
  - These questions were used to satisfy the third research objective what was: To investigate if there is a perception that law firms and legal publishers would use AI if it was affordable.
- **Impact on Legal Professionals – 2 Questions - (11.1, 11.2)**
  - These questions were used to satisfy the fourth research objective what was: To determine the perception of the effect that AI solutions would have on the hiring of legal professionals at law firms and legal publishers.
- **The Influence the respondent has within the Organisation – 1 Question – (12)**
  - This question was to determine whether the respondent had any influence within the organisation to suggest usage of AI technology or hiring behaviour of staff.

A structured questionnaire with closed-ended questions was developed. However, limited open-ended questions were presented due respondents needing to provide specific details of their company types and job roles. The questionnaire was four pages long and took approximately 10 minutes to complete during the pilot testing phase. The survey instrument was hand delivered and e-mailed to the respondents at their places of work with the aid of research assistants. A cover letter explaining the purpose of the study and assuring the respondents anonymity and confidentiality of the information was attached to the questionnaire along with a 1 page infographic which contained information about the availability and current usage trends of AI products in Law – See Appendix A. Questions were answered by simply checking the box from a set of possible answers.

The advantage of using a self-administered hand delivered questionnaire was that it was quicker to get mass responses versus an interview style questionnaire. The fact that respondents were informed of the collection date facilitated a higher response rates versus the e-mail prompting of online questionnaires. The disadvantage with self-administered questionnaires was that it took longer to distribute it to respondents as well as printing costs being higher versus online questionnaires.

### 3.12.2 Measurement Scale

According to Creswell (2013) a measurement scale had to be chosen to quantify the behavioral responses by the respondents in relation to items which were attempted to be measured with in the instrument. These scales could take the form of continuous scales e.g. strongly agree to strongly disagree or could be discrete/ordinal scales e.g. numerical or yes/no. These scales are used to codify behavioral responses into quantitative measurements to ensure that consistent sentiment was measured and analysed by the respondents (Sekaran & Bougie, 2016).

A Likert-style rating scale format is an ordinal scale which is used to measure the respondents opinion by allowing them to indicate how strongly they agree or disagree with the statement (Saunders et al., 2016). A five-category Likert scale was selected for the purposes of codifying the responses of the respondents into quantifiable integers ranging from 1 to 5. A matrix style format was selected for the question style and responses options ranged from strongly disagree or strongly agree. An example of a question from the questionnaire can be seen in Table 3.1 below.

**Table 3.1 Example of Likert Scale Matrix Format Question**

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
My company is aware of the advancements of Artificial Intelligence in Law.	1	2	3	4	5

The questionnaire itself can be viewed in Appendix C.

### **3.12.3 Pilot Testing**

While there are many types of pre-testing that can be performed, the method selected for this particular study was Pilot Testing. This makes sure that the questionnaire is reviewed to assess the suitability, usability and effectiveness, making certain that the questions are clear and concise, ensuring that the highest possible response rate is obtained with a minimal margin for error (Saunders et al., 2016). Pilot Testing, tested the instrument on a reduced set of individuals from the sample frame and was completed on approximately 5 respondents.

Responses were retrieved from the respondents and the questionnaire was revised based on this feedback. The first issue identified in the instrument was in Question 6, where 'Legal Document Creation' was duplicated and 'Contract Management' was excluded. The second revision to the questionnaire was in Question 11.2 which asked respondents to indicate the number of years it would take for AI Solutions to replace lawyers. The time selection options ranged from (< 3 years to > 10 years). Respondents asked for a time range of 'Never' to be included as they believed that AI Solutions would never replace lawyers. These participants were excluded from the final sample for the study (Creswell, 2013).

### **3.13 Data Analysis**

Data analysis is the science of examining raw unstructured data with the desired outcome of creating valuable meaning in the form of information and drawing conclusions from that information (Rubin & Bellamy, 2012). According to Creswell (2013) inferential statistical tests should be used to examine the propositions of the study and based on the categorical information on the independent variable (Availability of AI Law Solutions) and continuous information on the dependent variable (propensity to not hire legal practitioners).

Data from the study was collected and analysed with the assistance of an independent statistician using the Statistical Package for the Social Sciences (SPSS) to present tabulated data and graphs for the purposes of analysis and interpretation of the findings of the research. The purpose of analytic methods is to convert data into information needed to make decisions (Rubin & Bellamy, 2012). The choice of the methods of statistical analysis depended on the type of question to be answered, the number of variables, and the scale of measurement. The following analytical techniques were used to find patterns in the data collected.

- Descriptive statistics such as mean and standard deviation for the variables was calculated from data captured via the survey instrument and was presented via tabulated data and graphs.
- Chi-square goodness-of-fit-test: A univariate test, was used on a categorical variable to test whether any of the response options were selected significantly more/less often than the others.
- Binomial tests was used to test whether a significant proportion of respondents selected one of two possible responses.
- Spearman's correlation was used to measure how variables or rank orders are related.
- One sample t-test, tests whether a mean score is significantly different from a scalar value.
- Independent samples t-test: A test that compares two independent groups of cases.

These analytical techniques were used to determine the strength of the causal relationship between the independent and dependent variable and influence of the mediating and moderating variables.

### **3.14 Validity of Research**

*Validity* is the extent to which a variable of a quantitative study is accurately being measured and is fit for purpose i.e. do the survey questions accurately assess what you want to know (Creswell, 2013). According to Saunders et al. (2016) there are three main types of tests utilised to verify the validity of the research questionnaire.

- Content Validity – ensures that the questions in the questionnaire provide adequate coverage of the concepts being explored. Adequate coverage can be ascertained by drawing on concepts being tested from literature reviewed prior studies or using a panel of individuals to determine whether each question in the questionnaire is 'essential', 'useful but not essential' or 'not essential'.
- Criterion-related Validity – measures the ability of the questions to make accurate predictions such that one will be comparing the data from the questionnaire with that specified in the criterion. This is often carried out using statistical analysis such as correlation.
- Construct Validity – refers to the extent with which the results obtained from the study measure the theoretical hypotheses around which the research questionnaire is designed. This is measured through convergent and discriminant validity. Convergent validity is proven when the overlap obtained from two different research questionnaires measuring the same concept are highly correlated. Discriminant validity is proven when different

scales are used to measure theoretically distinct constructs and there is a lack of correlation between the scales.

*This study utilised content validity.* Due to the study being a first of its kind without the benefits of extending an existing body of knowledge saw the utilisation of construct validity being dismissed.

### **3.15 Reliability of Research**

Reliability refers to the consistency, dependability and repeatability of results over a period of time such that if the test was replicated using the same design, the results achieved would be similar (Saunders et al., 2016). According to Mitchell (1996) there are three common approaches to assessing reliability. These are

- *Test re-test* – data is correlated with those from the same questionnaire collected under near equivalent conditions as possible. Thus, the questionnaire needs to be completed twice by the respondents. The cross-sectional nature of the study did not permit such reliability tests
- *Internal consistency* – correlation of responses of questions in questionnaire to each other. The internal consistency of the instrument was evaluated using Cronbach's alpha coefficient which tests the level of consistency of the dataset where the Cronbach alpha can exist between 0 and 1 (Bryman & Bell, 2015). The closer the coefficient is to 1, the higher the internal consistency of the research instrument. A Cronbach alpha value  $> 0.7$  is widely accepted as implying reliable internal consistency (Mitchell, 1996).
- *Alternative form* – provides reliability within the questionnaire by comparing responses to alternative forms of the same question. This approach was not be utilised.

*Cronbach's alpha* was used in this study to test the internal consistency of the research questionnaire across the various questions in a subgroup. This was achieved by combining a reliability test on four separate measurements namely advancement, availability, capability and affordability of AI solutions. An aggregated Cronbach alpha  $> 0.93$  was achieved indicating that the instrument was reliable.

### **3.16 Ethical Considerations**

Ethics in business research is defined as an expected societal code of conduct that governs the researcher's behaviour while undertaking research (Sekaran & Bougie, 2016). Ethical Clearance for this dissertation was obtained from the University of KwaZulu-Natal Ethics Committee with

protocol reference number: HSS/1437/017M. The role of ethical conduct was paramount in the entire research process and the researcher took the appropriate steps to ensure that no ethical violation occurred.

Good ethical conduct was observed by making sure that respondents were not obliged to complete the questionnaire but was encouraged to complete it by emphasising the importance of the study to their company and their industry in upcoming years. The respondents were assured of confidentiality and anonymity, with the freedom to withdraw from participation at any point. The researcher abided by all ethical considerations by ensuring that the research was conducted objectively, authentically without biased interpretations and abiding by the guarantees provided to the respondent, by not divulging confidential information and ensuring the only valid and truthful inferences were declared and distributed.

### **3.17 Chapter Summary**

The pertinence of this research was triggered by the advancement of AI solutions in the legal industry, which could have the effect of rendering certain job functions redundant. This chapter presented the research design, paradigm and methodology used to exact the outcomes of this study. The research design selected was positivist, deductive, cross-sectional, quantitative method study (i.e. quantitative data was collected via a survey strategy and was used to determine the relationship between the usage of AI solutions in law firms and the effect it has on law firms hiring of legal practitioners). The survey instrument was a self-administered structured questionnaire used to collect data for the express purposes of proving a proposition based on a conceptual model, which was discussed in Chapter 2. The chapter continued to discuss the area of study and target population of private law firms and legal publishers within Durban, KwaZulu-Natal. The research instrument was then presented along with thematic questions and its measurement scales, while data analysis was performed on SPSS statistical package with the assistance of a statistician. Methods used to improve the instruments validity and reliability were discussed and the chapter concluded with a brief discussion of ethical considerations and what belts and braces were utilised to ensure the results of the study were not compromised. The next chapter will present the results of the statistical analysis of the data.



## CHAPTER FOUR

### Presentation and Discussion of Results

#### 4.1 Introduction

The culmination of identifying a research problem, presenting research objectives to resolve the problem, reviewing the literature and various theories available, selecting a research methodology and design along with data collection techniques via an appropriate research instrument, has yielded data which needs to be analysed and discussed. The conversion of the survey data into useful information is the fundamental nexus between achieving the research objectives presented in Chapter 1 and the proposed recommendations to relevant stakeholders discussed in Chapter 5.

The primary purpose of this chapter is to present, analyse and discuss the results gathered from the survey instrument, while linking them back to theory and the original research objectives with the express purpose of translating these into actionable recommendations for stakeholders in the proceeding chapter. The chapter commences by discussing the demographical data and the importance of these descriptive participant statistics. The discussion then utilises Table 4.1, which recapitulates the research objectives, while mapping these to the questions in the questionnaire in an effort to drive the conversation towards the findings of the study and the relevance of these findings in relation to the original research objectives.

**Table 4.1 Research Objective and Questionnaire Question Mapping**

Research Objective	Questions in Questionnaire
RO1: To ascertain if employees at law firms and legal publishers are aware of advancements of AI in the legal industry.	Q7.1: I am aware of the advancements of AI solutions Q7.2: I am aware of the availability of AI solutions

Research Objective	Questions in Questionnaire
RO2: To determine if there is a perception that law firms and legal publishers would use AI if it was accurate, quick and consistent to use.	<p>Q8.1: Indicate your <u>personal</u> usage of AI solutions in your current job function</p> <p>Q8.2: Are you aware of the use of AI Solutions in other departments at your company?</p> <p>Q9: Indicate your agreement that you would recommend that your company invest in AI Solutions in the following job functions <b><i>regardless of price</i></b>, if it helped legal professionals perform their jobs quicker and more accurately</p>
RO3: To investigate if there is a perception that law firms and legal publishers would use AI if it was affordable.	Q10: Indicate your agreement that you would recommend that your company invest in AI Solutions in the following job functions to increase legal professional's productivity, if it was <b>quicker, more accurate and cost effective:</b>
RO4: To determine the perception of the effect that AI solutions would have on the hiring of legal professionals at law firms and legal publishers.	<p>Q11.1.1: I believe that AI solutions <b><i>are not mature enough</i></b> yet to replace human legal professionals</p> <p>Q11.1.2: The availability of accurate, fast, consistent, and cost effective AI solutions <b><i>would</i></b> make <b><i>me</i></b> hire fewer legal professionals</p> <p>Q11.1.3: I am of the opinion that the availability of accurate, fast, consistent, and cost effective AI solutions <b><i>would</i></b> make <b><i>my company</i></b> hire fewer legal professionals</p> <p>Q11.2: Indicate your opinion on the number of years it will take for AI Solutions to replace lawyers</p>

## 4.2 Survey Participation Statistics

Section A in the questionnaire focuses on various demographical information of the respondents, for example their age, gender, position, job roles. The need to gather demographic information was important to discern that responses were gathered from a broad range of respondents in the legal profession. A lack of diversity in the respondents profile could have the effect of adding bias in the survey. E.g. older male lawyers may be averse to adoption of new technologies as they are set in their ways and may not be amenable to technological change. The job position and job role metrics were once again important in making sure that there was a spread in the seniority of respondents in an attempt to get an evenly distributed category of legal professionals to subvert the influence of bias on the study.

### 4.2.1 Age of the respondents

Table 4.2 shows that there was an even representation of the age demographics of the legal professional respondents. The participant age demographics was characterised by 38.2% being between the age of 20 and 29 years, 30.4% were between the ages of 30 and 39 years, 26.5% between the ages of 40 and 49 years and 5% being between the ages of 50 and 59 years old.

**Table 4.2 Age of respondents**

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	20-29	39	38.2	38.2	38.2
	30-39	31	30.4	30.4	68.6
	40-49	27	26.5	26.5	95.1
	50-59	5	4.9	4.9	100.0
	Total	102	100.0	100.0	

### 4.2.2 Gender of the respondents

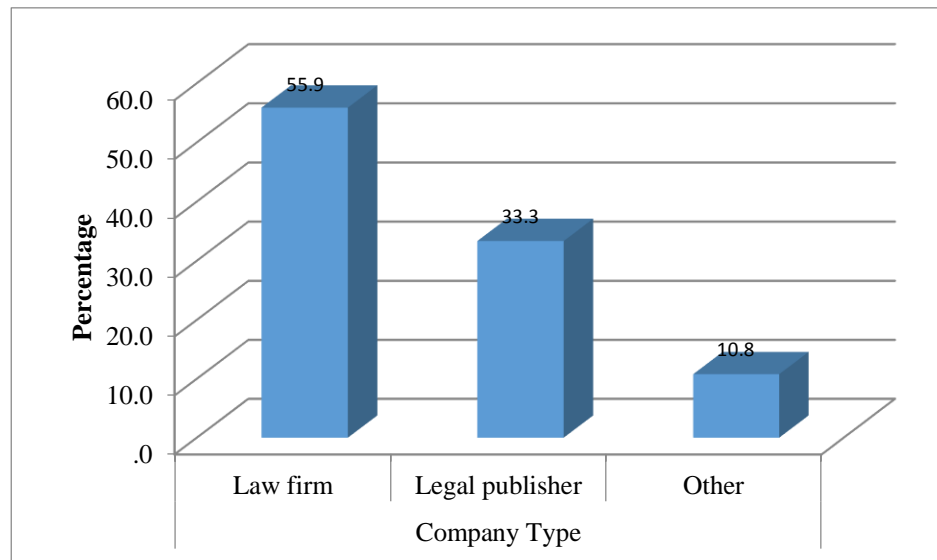
Table 4.3 indicates that there were more female respondents who participated in the research survey with approximately two thirds (61.8%) being females and one third (38.2%) being males.

**Table 4.3 Gender of respondents**

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Male	39	38.2	38.2	38.2
Female	63	61.8	61.8	100.0
Total	102	100.0	100.0	

#### **4.2.3 Company types**

Figure 4.1 describes the type of organisation in which the respondents worked and is meant to characterise the type of work these private organisations are meant to perform. Law firms represented 55.9%, legal publishers represented 33.3% and 11% constituted the remainder of the company types that respondents worked for. The companies constituting ‘Other’ in Figure 4.1 are private companies with legal departments or private practice advocates.



**Figure 4.1 Company type**

#### **4.2.4 Positions of respondents**

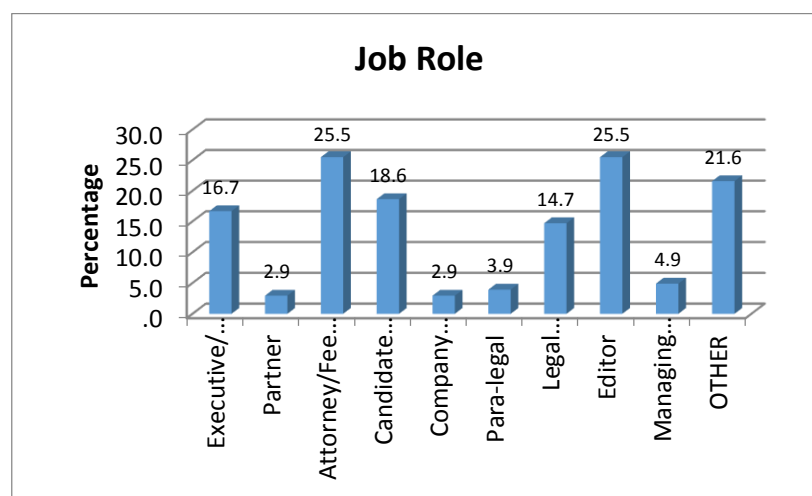
Table 4.4 below describes the positions of respondents at their respective places of work. The spread was that 24.5% of respondents were senior managers, 12.7% were middle management, 8.8% represented supervisor and the majority of the respondents at 52.9% were normal staff members with 1 response being unspecified with regards to their position in their company. The relevance of these statistics is to show that the opinion of all positions in the company were taken into consideration and responses were not only representative of a particular level of staff.

**Table 4.4 The position of respondents**

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Senior management	25	24.5	24.8	24.8
	Middle management	13	12.7	12.9	37.6
	Supervisor	9	8.8	8.9	46.5
	Staff	54	52.9	53.5	100.0
	Total	101	99.0	100.0	
Missing	System	1	1.0		
Total		102	100.0		

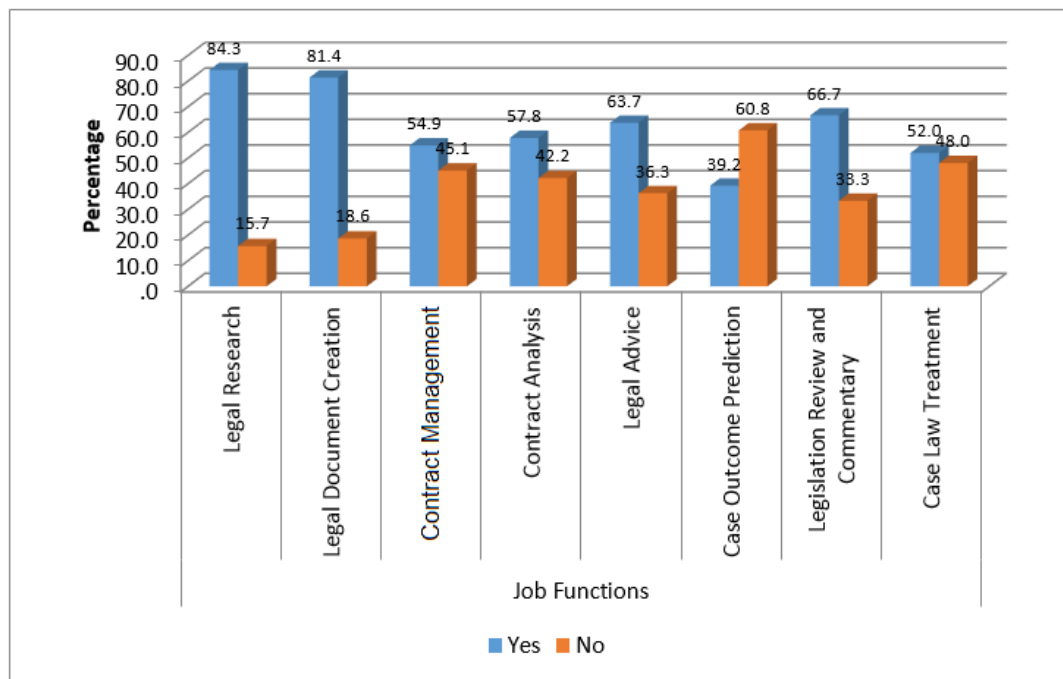
#### 4.2.5 Job role of respondents

Figure 4.2 below shows the job roles of the respondents that took part in the survey. Respondents could occupy more than one role in the company, for example, they can be an executive member, but also perform the job role of an attorney. Therefore, the spread of percentages below is not meant to add up to 100 percent. Figure 4.2 describes that the majority of respondents were Attorneys at 25.5%, Editors at 25.5% and 21.6 being in other roles (1 being a GM of Sales and the others not being specified). The remainder of the job roles being represented at 16.7% were executive member, 2.9% were partners in a law firm, 18.6% were candidate attorneys, 2.9% were company secretaries, 3.9% were paralegals, 14.7% were legal researchers, and 4.9% were managing researchers.

**Figure 4.2 Job Role**

#### 4.2.6 Job Functions

Figure 4.3 represents the job functions that respondents' organisation perform. A significant proportion indicated that their company performs legal research (84%); legal document creation (81%), legal advice (64%) and legislation review and commentary (67%). The remainder of the job functions were performed at surveyed companies as follows: Contract management (54.9%), contract analysis (57.8%), legal advice (63.7%), case outcome prediction (60.8%), and case law treatment at (52%). While the list of job functions is not an exhaustive list of services that legal firms perform, the significance of selecting these job functions lies in the fact that they are currently being performed by AI software solutions. The job functions will be the basis of most ensuing survey questions.



**Figure 4.3 Job Functions**

### 4.3 Presentation and Discussion of Results

#### 4.3.1 RO1: Awareness of advancements of AI in the legal industry

According to Table 4.1, two questions with 8 Likert type statements each were used to satisfy the first research objective by finding out whether the respondents were aware of the advancement and availability of AI Solutions using two questions

- Q7.1: I am aware of the advancements of AI solutions
- Q7.2: I am aware of the availability of AI solutions

The mean, standard deviations, t-values and p-values of each of the 8 Likert type items assessing the awareness of the advancement of AI solutions in the legal industry is presented in Table 4.4 below. The results can be interpreted as the respondents are in significant agreement when the mean > 3 and in significant disagreement with the statement if the mean < 3.

#### 4.3.1.1 I am aware of the advancements of AI solutions

The results as can be seen in Table 4.5 shows that there is significant agreement that there is awareness of advancements in AI solutions in:

- legal research (M=3.72), t (100) = 6.680, p<.0005
- legal document creation (M=3.68), t (101) = 5.715, p<.0005
- contract management (M=3.30), t (99) = 5.715, p<.006
- case law treatment (M=3.28), t (100) = 5.715, p<.014

There was no significant awareness of advancement in AI solutions for the remainder of the job functions.

**Table 4.5 Awareness of advancements of AI solutions**

<b>I am aware of the advancements of AI solutions</b>	<b>N</b>	<b>Mean</b>	<b>Std Deviation</b>	<b>t-value</b>	<b>p-value</b>
7.1.1 Legal Research **	101	<b>3.72</b>	<b>1.087</b>	<b>6.680</b>	<b>.0005</b>
7.1.2 Legal Document Creation **	102	<b>3.68</b>	<b>1.195</b>	<b>5.715</b>	<b>.0005</b>
7.1.3 Contract Management **	100	<b>3.30</b>	<b>1.068</b>	<b>2.808</b>	<b>.006</b>
7.1.4 Contract Analysis	100	3.17	1.120	1.518	.132
7.1.5 Legal Advice	102	2.94	1.167	-0.509	.612
7.1.6 Case Outcome Prediction	101	3.18	1.228	1.459	.148
7.1.7 Legislation Review and Commentary	102	3.16	1.132	1.399	.165
7.1.8 Case Law Treatment **	101	<b>3.28</b>	<b>1.115</b>	<b>2.500</b>	<b>.014</b>

*\*\* Line items in bold text refer to statements where significant agreement was achieved with regards to the question*

#### 4.3.1.2 I am aware of the availability of AI solutions

The results as can be seen in Table 4.6 shows that there is significant agreement that there is awareness of availability in AI solutions in:

- legal research (M=3.72),  $t(100) = 6.680$ ,  $p < .0005$
- legal document creation (M=3.68),  $t(101) = 5.715$ ,  $p < .0005$
- contract management (M=3.30),  $t(99) = 5.715$ ,  $p < .006$
- case law treatment (M=3.28),  $t(100) = 5.715$ ,  $p < .014$

There was no significant awareness of availability in AI solutions for the remainder of the job functions.

**Table 4.6 Availability of AI solutions**

<b>I am aware of the availability of AI solutions</b>	<b>N</b>	<b>Mean</b>	<b>Std Deviation</b>	<b>t-value</b>	<b>p-value</b>
7.2.1 Legal Research **	102	<b>3.59</b>	<b>1.222</b>	<b>4.863</b>	<b>.0005</b>
7.2.2 Legal Document Creation **	102	<b>3.55</b>	<b>1.287</b>	<b>4.309</b>	<b>.0005</b>
7.2.3 Contract Management **	101	<b>3.25</b>	<b>1.252</b>	<b>1.987</b>	<b>.050</b>
7.2.4 Contract Analysis	99	2.94	1.159	-.520	.604
7.2.5 Legal Advice	101	2.80	1.166	-1.706	.091
7.2.6 Case Outcome Prediction	101	3.03	1.212	.246	.806
7.2.7 Legislation Review and Commentary	101	3.03	1.195	.250	.803
7.2.8 Case Law Treatment	101	3.04	1.224	.325	.746

*\*\* Line items in bold text refer to statements where significant agreement was achieved with regards to the question*

#### 4.3.1.3 Discussion of RO1 Results

Boianovsky and Trautwein (2010) provide insight into the Theory of Technological Unemployment stating that if new machinery is adopted and yields higher output for a particular job function at a reduced cost of production, then displacement of the labour in that particular market sector and job function is likely. The conceptual framework which was proposed in Figure 2.2, suggested that the *independent variable* of the availability of new technology viz. artificial intelligence solutions that was cost effective AI solutions (*moderating variable*) which yields a



higher job performance output (*mediating variable*) would result in the reduction in recruitment of legal professionals (*dependent variable*) in law firms and legal publishers.

The results of the questions that attempted to resolve the first research objective above was that there was a significant agreement of the 102 respondents that they were aware of advancements and availability of AI solutions specifically in the job functions of legal research, legal document creation, and contract management. While there was awareness of advancements of case law treatment AI solutions, there was no acknowledgement of availability of such solutions. The respondents were oblivious to the advancement and availability of AI solutions, which could perform job functions in Contract Analysis, Legal Advice, Case Outcome Prediction, Legislation Review and Commentary.

Therefore, according to Boianovsky and Trautwein (2010) and following on from the conceptual framework, availability of affordable, yield-producing AI solutions in the job functions of legal research, legal document creation, contract management should cause the hiring of less legal professionals to perform these tasks.

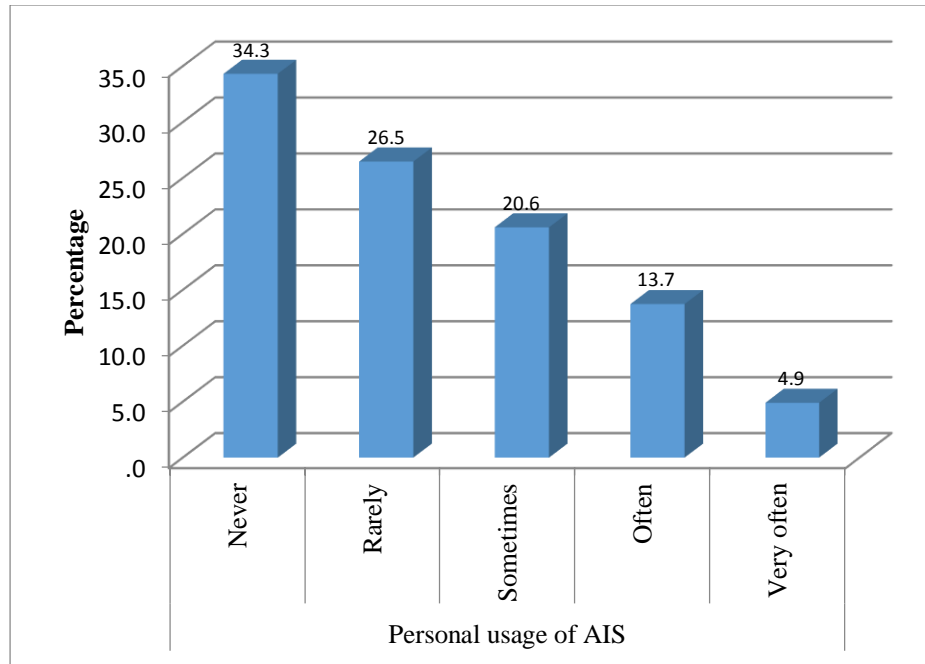
#### **4.3.2 RO2: Usage of AI if it was accurate, quick and consistent to use.**

Table 4.1 describes the three questions below that was used to satisfy the second research objective by finding out whether the respondents believed that there is a perception that law firms and legal publishers would use AI if it was accurate, quick and consistent to use.

- Q8.1: Indicate your personal usage of AI solutions in your current job function
- Q8.2: Are you aware of the use of AI Solutions in other departments at your company?
- Q9: Indicate your agreement that you would recommend that your company invest in AI Solutions in the following job functions ***regardless of price***, if it helped legal professionals perform their jobs quicker and more accurately

##### **4.3.2.1 Indicate your personal usage of AI solutions in your current job function**

A significant proportion of the respondent pool, 62 (60.8%) indicated that they ‘never’ or ‘rarely’ use AI Solutions in their current job function,  $\chi^2(4) = 26.235$ ,  $p < .0005$  and a smaller proportion of the sample 19 (18.6%) indicated that they worked with AI solutions ‘often’ or ‘very often’.



**Figure 4.4 Personal usage of AI solutions in respondents current job function**

#### 4.3.2.2 Are you aware of the use of AI Solutions in other departments at your company?

Table 4.7 explains that statistically, there is no difference in the number who responded 'Yes' and the number who responded 'No'. The spread however, was that 42% responded as knowing of other departments in their company using AI solutions, 57% responded that they were not aware of other departments in their company utilising AI solutions and 1 response was not filled in.

**Table 4.7 Are you aware of the use of AI Solutions in other departments at your company?**

Are you aware of the use of AI Solutions in other departments at your company?	Frequency	Percent
Yes	43	42.2
No	58	56.9
Missing	1	1.0
Total	102	100

4.3.2.3 Indicate your agreement that you would recommend that your company invest in AI Solutions in the following job functions regardless of price, if it helped legal professionals perform their jobs quicker and more accurately

The results, as can be seen in Table 4.8, shows that there is significant agreement amongst the respondents that they would advocate the investment in AI solutions by their companies regardless of price, provided that it assisted legal professionals to be quicker and more accurate in their jobs. This sentiment is supported by high mean values for all of the job functions, which are all greater than the norm of the mean being equal to 3. The frequency distribution of the sentiment to advocate the use of AI solutions for each job function can be summarised as follows.

- **Legal Research:** 86% advocated the use of AI solutions; 6% were neutral; 8% would not advocate the use of AI solutions even if it helped work throughput at a company
- **Legal Document Creation:** 77% advocated the use of AI solutions; 12% were neutral; 11% would not advocate the use of AI
- **Contract Management:** 73% advocated the use of AI solutions; 13% were neutral and 13% would not advocate the technology and 1% was not completed
- **Contract Analysis:** 65% advocated the use of AI solutions; 17% were neutral and 17% would not advocate the technology and 1% was not completed
- **Legal Advice:** 47% advocated the use of AI solutions; 21% were neutral and 32% would not advocate the technology
- **Case Outcome Prediction:** 66% advocated the use of AI solutions; 20% were neutral and 14% would not advocate the technology
- **Legislation Review and Commentary:** 70% advocated the use of AI solutions; 15% were neutral and 15% would not advocate the technology
- **Case Law Treatment:** 69% advocated the use of AI solutions; 18% were neutral and 13% would not advocate the technology.

**Table 4.8 Recommendation to invest in AI regardless of price**

Indicate your agreement that you would recommend that your company invest in AI Solutions in the following job functions <i>regardless of price</i> , if it helped legal professionals perform their jobs quicker and more accurately		N	Mean	Std Deviation	t-value	p-value
9.1	Legal Research **	102	<b>4.23</b>	<b>.943</b>	<b>13.125</b>	<b>.0005</b>
9.2	Legal Document Creation **	102	<b>4.08</b>	<b>1.096</b>	<b>9.936</b>	<b>.0005</b>
9.3	Contract Management **	101	<b>3.91</b>	<b>1.114</b>	<b>8.214</b>	<b>.0005</b>
9.4	Contract Analysis **	101	<b>3.74</b>	<b>1.180</b>	<b>6.323</b>	<b>.0005</b>
9.5	Legal Advice **	102	<b>3.25</b>	<b>1.287</b>	<b>2.000</b>	<b>.048</b>
9.6	Case Outcome Prediction **	102	<b>3.78</b>	<b>1.122</b>	<b>7.057</b>	<b>.0005</b>
9.7	Legislation Review and Commentary **	102	<b>3.81</b>	<b>1.123</b>	<b>7.316</b>	<b>.0005</b>
9.8	Case Law Treatment **	102	<b>3.83</b>	<b>1.091</b>	<b>7.716</b>	<b>.0005</b>

*\*\* Line items in bold text refer to statements where significant agreement was achieved with regards to the question*

#### 4.3.2.4 Discussion of RO2 Results

Referring back to chapter 1, the second research objective was to determine if there is a perception that law firms and legal publishers would use AI if it was accurate, quick and consistent to use. The conceptual framework which was proposed in Figure 2.2, proposes that the question that satisfies the second objective (How likely are employees at law firms and legal publishers to recommend that their company invest in AI Solutions, *with the job functions defined in this study*, regardless of price, if it helped legal professionals perform their jobs quicker and more accurately?). This question group defined in RO2 of Table 4.1 would constitute the mediating variable of the conceptual framework (see Figure 2.2).

The mediating or intervening variable is a variable that appears between the commencement of operation of the independent variable and is expected to have an influence on the dependent variable and is useful in modelling processes or conceptual frameworks (Sekaran & Bougie, 2016). Therefore, the purpose of the mediating variable is to facilitate the understanding of the causal relationship between the independent and the dependent variables.

The results above showed that respondents statistically agreed that they would advocate that their companies should invest in AI Solutions regardless of price, if it produced additional accurate work yield. This trend presented itself regardless of whether employees were using AI in their current job roles (62% never or rarely used AI) and whether they were aware of other departments in their company using AI Solution (57% were not aware, 42% were aware and 1% abstained). This statistical trend is indicative of the characteristics of a mediating variable.

The quantitative nature of this study does not provide insight as to why the general sentiment of respondents who took this survey advocated accurate, yield-producing AI solutions. Academically, this could be attributed to the adoption of technology for the purposes of their firm gaining a sustainable competitive advantage (Boianovsky & Trautwein, 2010; Porter, 1985; Stonehouse & Snowdon, 2007).

An interesting emerging trend to notice is the strong correlation between the awareness of advancements and availability of AI solutions in the legal research, legal document creation, contract management job functions and the high frequency distribution of respondents advocating that organisations invest in the purchase and usage of AI solutions. Legal research achieving 86% advocating of the use of AI solutions; legal document creation achieving 77% advocating the use of AI solutions and contract management achieving 73% advocating the use of AI solutions. Legislation review and commentary was an outlier with 70% of respondents advocating the investment in AI solutions even though there was a low agreement of awareness of advancement and availability of AI software, which could fulfil this activity. These trends are supported by the study by Remus & Levy, (2015) which detailed that functions such as legislation review, legal research and contract management occupied 46% of a lawyer's time. It therefore makes sense that legal practitioners who are aware of advancements and availability of AI solutions would invest in this software so that it could provide them with more time for functions with which AI is not adept.

#### **4.3.3 RO3: Usage of AI if it was affordable**

Table 4.1 describes the question below that was used to satisfy the third research objective by finding out whether the respondents believed that there is a perception that law firms and legal publishers would use AI if it was affordable.

- Q10: Indicate your agreement that you would recommend that your company invest in AI Solutions in the following job functions to increase legal professional's productivity, if it was **quicker, more accurate and cost effective**.

4.3.3.1 Indicate your agreement that you would recommend that your company invest in AI Solutions in the following job functions to increase legal professional's productivity, if it was quicker, more accurate and cost effective.

The results as can be seen in Table 4.9 shows that there is significant agreement amongst the respondents that they would advocate the investment in AI solutions by their companies provided that it assisted legal professionals to be quicker and more accurate in their jobs while being cost-effective. This sentiment is supported by high mean values for all of the job functions, which are all greater than the norm of the mean being equal to 3. The frequency distribution of the sentiment to advocate the use of AI solutions for each job function can be summarised as follows.

- **Legal Research:** 90% advocated the use of AI solutions; 6% were neutral; 4% would not advocate the use of AI solutions even if it helped work throughput at a company and was cost-effective
- **Legal Document Creation:** 82% advocated the use of AI solutions; 11% were neutral; 5% would not advocate the use of AI and 2% did not respond to this question
- **Contract Management:** 78% advocated the use of AI solutions; 14% were neutral and 7% would not advocate the technology and 1% did not respond to this question
- **Contract Analysis:** 74% advocated the use of AI solutions; 18% were neutral and 7% would not advocate the technology and 1% did not respond to this question
- **Legal Advice:** 54% advocated the use of AI solutions; 22% were neutral and 23% would not advocate the technology and 1% did not respond to this question
- **Case Outcome Prediction:** 66% advocated the use of AI solutions; 22% were neutral and 11% would not advocate the technology and 1% did not respond to this question
- **Legislation Review and Commentary:** 74% advocated the use of AI solutions; 15% were neutral and 11% would not advocate the technology
- **Case Law Treatment:** 75% advocated the use of AI solutions; 19% were neutral and 6% would not advocate the technology

**Table 4.9 Recommendation to invest in AI if it was cost effective**

<b>Indicate your agreement that you would recommend that your company invest in AI Solutions in the following job functions to increase legal professional's productivity, if it was <i>quicker, more accurate and cost effective</i></b>	<b>N</b>	<b>Mean</b>	<b>Std Deviation</b>	<b>t-value</b>	<b>p-value</b>
10.1 Legal Research **	102	<b>4.33</b>	<b>.800</b>	<b>16.829</b>	<b>.0005</b>
10.2 Legal Document Creation **	100	<b>4.23</b>	<b>.941</b>	<b>13.068</b>	<b>.0005</b>
10.3 Contract Management **	101	<b>4.06</b>	<b>.968</b>	<b>11.002</b>	<b>.0005</b>
10.4 Contract Analysis **	101	<b>4.01</b>	<b>.954</b>	<b>10.640</b>	<b>.0005</b>
10.5 Legal Advice **	101	<b>3.46</b>	<b>1.253</b>	<b>3.652</b>	<b>.0005</b>
10.6 Case Outcome Prediction **	101	<b>3.87</b>	<b>1.036</b>	<b>8.452</b>	<b>.0005</b>
10.7 Legislation Review and Commentary **	102	<b>3.95</b>	<b>1.009</b>	<b>9.522</b>	<b>.0005</b>
10.8 Case Law Treatment **	102	<b>4.05</b>	<b>.948</b>	<b>11.177</b>	<b>.0005</b>

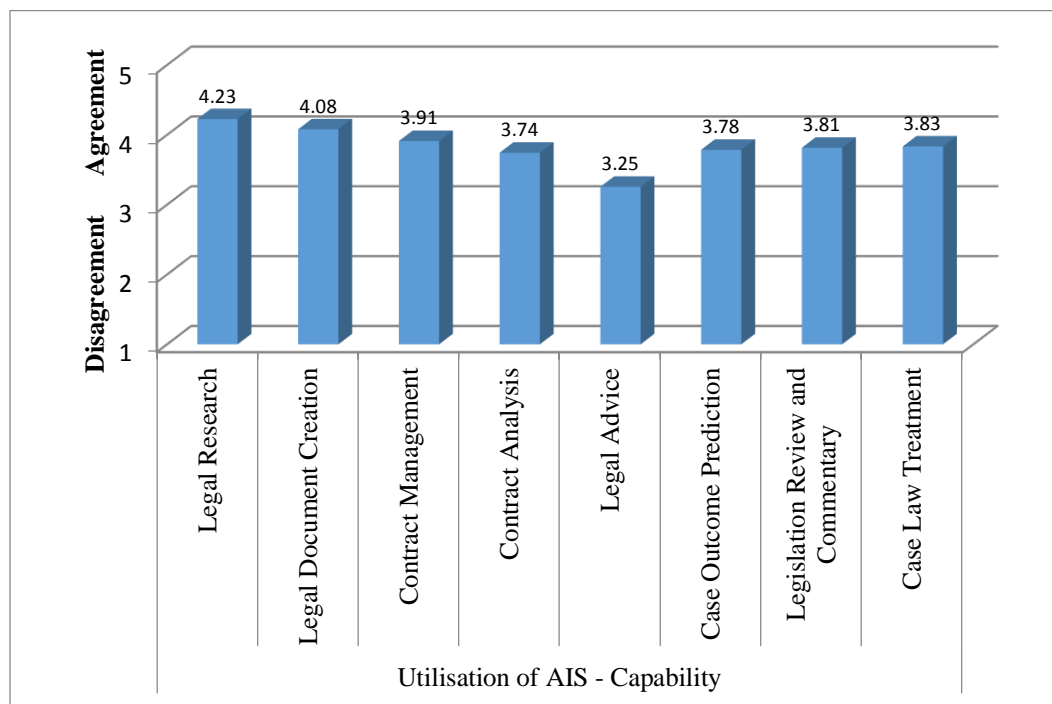
**\*\* Line items in bold text refer to statements where significant agreement was achieved with regards to the question**

#### 4.3.3.2 Discussion of RO3 Results

Table 4.1 lists the third research objective, which was to determine if there is a perception that law firms and legal publishers would use AI if it was affordable. The conceptual framework, which was proposed in Figure 2.2, proposes that the following question will satisfy the third objective (How likely are employees at law firms and legal publishers to recommend that their company invest in AI Solutions, *with the job functions defined in this study*, if it was affordable?). This question group defined in RO3 of Table 4.1 would constitute the moderating variable of the conceptual framework (see Figure 2.2).

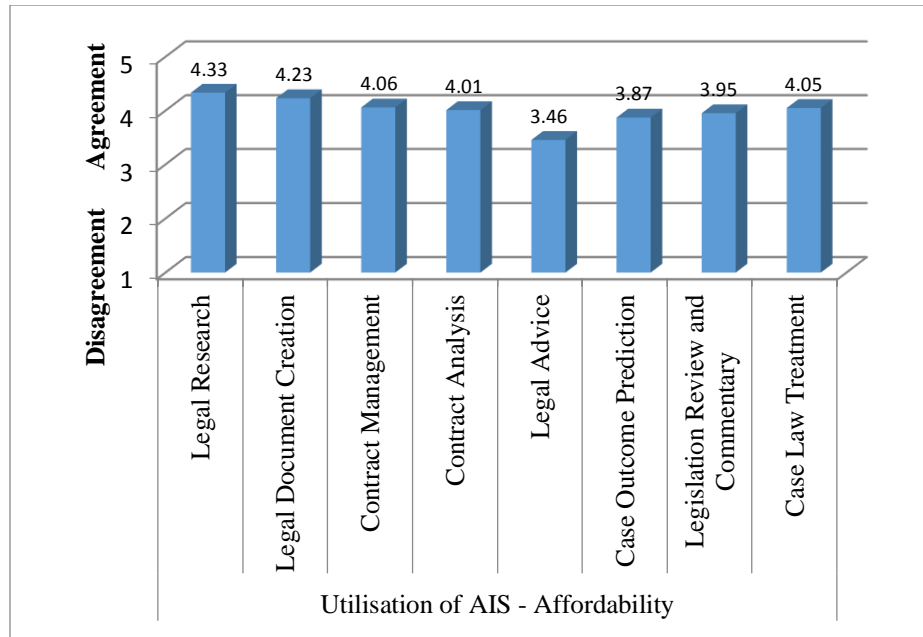
Thompson (2006, cited in Creswell, 2013) describes a moderating variable as a type of independent variable that influences the direction and/or strength of the independent variable-dependent variable relationship. Sekaran and Bougie (2016) are in congruence with the previous description by adding that once a moderating variable is added to the concept it has a multiplicative or divisive behavior on the dependent variable and the independent variable-dependent variable relationship becomes contingent on the existence of this variable.

The results above showed that respondents statistically agreed that they would advocate that their companies should invest in AI Solutions if it produced additional accurate work yield and was cost-effective. As was discussed in the RO2, this trend presented itself regardless of whether employees were using AI in their current job roles. The effect of the moderating variable suggested in the conceptual framework in Figure 2.2 can be observed by comparing the mean distribution of respondents who advocated the investment of AI solutions by their firm if it was quicker, more accurate and consistent regardless of price in Figure 4.5 vs that of Figure 4.6. Where Figure 4.6 represents the respondents attitude towards the AI solution being cost-effective. The comparison between the two graphs shows an average marginal increase of advocating the investment of AI solutions if the solution was cost effective. This statistical trend is indicative of the behaviour of a moderating variable (even though adoption of AI technology is specifically defined as the dependent variable) as is proposed by (Creswell, 2013; Sekaran & Bougie, 2016; Thompson, 2006).



**Figure 4.5 Mean distribution of respondents advocating investing of AI technologies regardless of price**





**Figure 4.6 Mean distribution of respondents advocating investing of AI technologies if it was cost-effective**

Another interesting trend to notice, which again cannot be explained by the quantitative nature of this study, is why legal practitioners are least confident that they would use yield-generating technology for the job function of providing legal advice. Studies performed by McKinsey Global Institute and the University of North Carolina School of Law described this phenomena where there was consensus that AI software could not perform the legal functions of stakeholder interaction, legal writing, advising clients, negotiations and court appearances (Chui et al., 2015; Remus & Levy, 2015). This trend can be viewed by observing the legal advice statistic in the frequency distribution above, Table 4.8, Figure 4.5 and Figure 4.6 and is a prime candidate as a recommendation for further research for any future studies, which may wish to further this body of knowledge.

#### **4.3.4 RO4: Impact on legal professionals at law firms and legal publishers**

Table 4.1 describes the four questions below that was used to satisfy the fourth and final research objective by finding out whether the respondents perceived that AI solutions would have an effect on the hiring of legal professionals at law firms and legal publishers.

- Q11.1.1: I believe that AI solutions *are not mature enough* yet to replace human legal professionals

- Q11.1.2: The availability of accurate, fast, consistent, and cost effective AI solutions *would* make *me* hire fewer legal professionals
- Q11.1.3: I am of the opinion that the availability of accurate, fast, consistent, and cost effective AI solutions *would* make *my company* hire fewer legal professionals
- Q11.2: Indicate your opinion on the number of years it will take for AI Solutions to replace lawyers

4.3.4.1 I believe that AI solutions *are not mature enough* yet to replace human legal professionals

The results, as can be seen in Table 4.10, shows that there is significant agreement amongst the respondents that they believe that AI solutions are not mature enough to replace human legal professionals. This sentiment is supported by the following statistical values: (M=4.10),  $t(101) = 11.433$ ,  $p < .0005$  with 83% agreeing or strongly agreeing that AI solutions are not yet mature enough; 7% taking a neutral stance and 10% believing that AI solutions are mature enough to replace human legal professionals.

4.3.4.2 I am of the opinion that the availability of accurate, fast, consistent, and cost effective AI solutions *would make me* hire fewer legal professionals

Table 4.9 shows that there is marginal agreement amongst the respondents that they believe that AI solutions which are accurate, quick, consistent and cost effective would convince them use the technology and hire fewer legal professionals. This sentiment is supported by the following statistical values: (M=3.56),  $t(100) = 5.593$ ,  $p < .0005$  with 59% agreeing or strongly agreeing that they would hire fewer legal professionals. A neutral stance of 26% was measured and 14% believe they would not reduce the number of legal professionals hired in the light of available yield-producing, accurate, cost-effective AI software. Respondents abstaining from answering the questions accounted for 1%.

4.3.4.3 I am of the opinion that the availability of accurate, fast, consistent, and cost effective AI solutions *would make my company* hire fewer legal professionals

A marginal agreement amongst the respondents that they believe that AI solutions, which are accurate, quick, consistent and cost effective would convince their companies to use the technology and hire fewer legal professionals as can be observed by the results in Table 4.9. This sentiment is supported by the following statistical values: (M=3.76),  $t(100) = 7.728$ ,  $p < .0005$  with

63% agreeing or strongly agreeing that they would hire fewer legal professionals. A neutral stand of 24% was measured and 12% believe their companies *would not* reduce the number of legal professionals hired in the light of available yield-producing, accurate, cost-effective AI software. Respondents abstaining from answering the questions accounted for 1%.

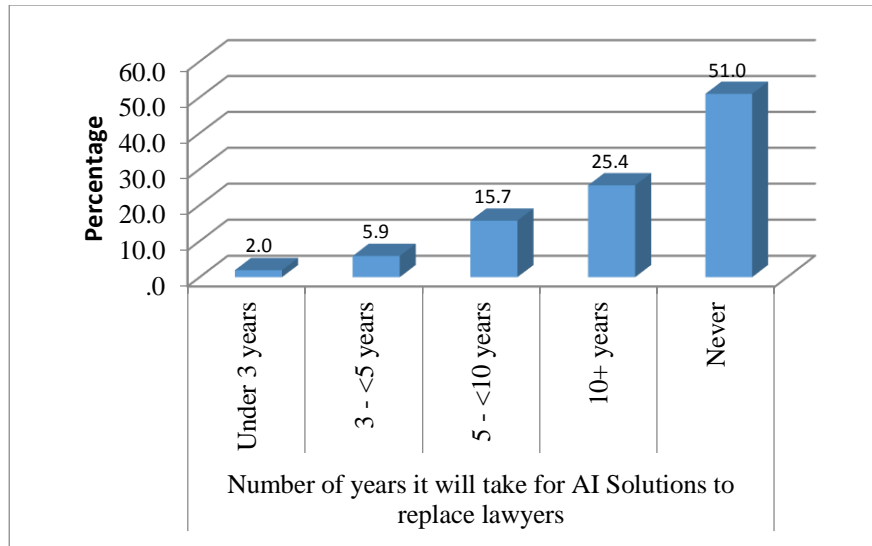
**Table 4.10 The impact on legal professionals**

<b>The impact on legal professionals</b>	<b>N</b>	<b>Mean</b>	<b>Std Deviation</b>	<b>t-value</b>	<b>p-value</b>
11.1.1 I believe that AI solutions are not mature enough yet to replace human legal professionals **	<b>102</b>	<b>4.10</b>	<b>.970</b>	<b>11.433</b>	<b>.0005</b>
11.1.2 The availability of accurate, fast, consistent, and cost effective AI solutions would make me hire fewer legal professionals **	<b>101</b>	<b>3.56</b>	<b>1.014</b>	<b>5.593</b>	<b>.0005</b>
11.1.3 The availability of accurate, fast, consistent, and cost effective AI solutions would make my company hire fewer legal professionals **	<b>101</b>	<b>3.76</b>	<b>.991</b>	<b>7.728</b>	<b>.0005</b>

*\*\* Line items in bold text refer to statements where significant agreement was achieved with regards to the question*

4.3.4.4 Indicate your opinion on the number of years it will take for AI Solutions to replace lawyers

Figure 4.7 shows the time span that respondents believe it will take for AI technology to replace human lawyers. A total of 51% of respondents suggest that AI will never replace human lawyers, 25.4% believe it will take > 10 years, 15.7% believe AI will surpass human lawyers between five and ten years from now, 6% believe it will take between three and five years and 2% believe human lawyers will be made redundant in under 3 years.



**Figure 4.7 The Number of years it will take for AI Solutions to replace lawyers**

#### 4.3.4.5 Influence in adopting AI technologies and/or hiring behaviour in the company

Table 4.11 describes the questions asked of the respondents to determine their sway in investing in AI technologies and/or the hiring of staff in their company. The scale in the question had the options of a minimum of 1 = no influence to 5 = a great deal of influence. The results show that there was a mean of 2.36 for the average influence the participants had in steering the company to utilising AI technology. Similar statistics were observed for the influence respondents had on the hiring behaviour of staff at their company with a mean of 2.01. Thus, analysis shows that in general, this sample has very little influence in driving adoption of AI technologies and similarly on the hiring of staff at their organisations. While these questions had no bearing on the achieving of the research objectives, they were asked alongside the demographic questions discussed earlier, to determine whether the respondent sample's opinion were those of influential employees who could realise the conceptual model as shown in Figure 2.2

**Table 4.11 The influence respondents have adopting AI technologies and/or hiring staff in their company**

Rate the extent of the influence that you have in the following areas:		N	Min	Max	Mean	Std Deviation
12.1	The usage of AI technology in the company	102	1	5	2.36	1.427
12.2	The hiring behaviour in the company	100	1	5	2.01	1.337

#### 4.3.4.6 Discussion of RO4 results

Questions Q11.1 and Q11.2 were used to determine if AI solutions would have an impact on human legal professionals. The conceptual framework, which was proposed in Figure 2.2, defines the “Hiring of legal professionals at private legal organizations” as the dependent variable in this phenomenon being explored. Creswell (2013) describes a dependent variable as a variable, which is effected by influence being exerted on the independent variable, as well as the mediating variable.

Questions 11.1, 11.2 and 11.3 were used to determine the extent of agreement of the research respondents that they or their company would hire fewer legal professionals if they were presented with cost effective, accurate, yield-producing AI software. While respondents were strongly in agreement that AI solutions were not yet mature enough to replace human legal professionals, they did feel that they and marginally more so, their companies, would hire *fewer* legal professionals in lieu of AI solutions. Even though this sentiment was evident in the statistical analysis, 51% believe that AI will never replace the human legal professional and 49% believe that lawyers will eventually be replaced by AI software even though with 25.4% of this subset of respondents believe this will take place over a protracted time frame exceeding 10 years.

As was discussed in the literature review, Boianovsky & Trautwein (2010) and later Feldmann (2013) espouse that the productivity of machinery (in this case AI software) is measured by the amount of living labour that it replaces and given a level of output, the new machine makes it possible to reduce the number of workers employed and increases the output per worker. This supports the feedback received from the survey respondents who advocated the use of the software and the hiring of fewer legal professionals.

Even though this was not an objective of the research or part of the conceptual framework, a further statistical test was performed in the form of a Spearman’s’ correlation test which was conducted to determine the relationship between usage of AI solutions (Q8.1) and the impact it has on the hiring of legal professionals (Q11.1). The study found *no significant* correlation exists between:

- AI Usage and whether respondents believe that AI solutions were not mature enough to replace human legal professionals (Q11.1.1). This was denoted by a correlation coefficient ( $r = 0.078$ ,  $p < 0.01$ ). This outcome could be perceived in a number of ways. If the respondent had a positive experience with regards to utilising AI solutions, they may think

that AI is mature enough to replace human legal professionals. Having a negative experience could have the effect of supporting a positive correlation. This insight unfortunately falls outside of the realm of this quantitative study and is a possible recommendation for future studies.

- AI usage and whether the availability of accurate, fast, consistent, and cost effective AI solutions would make the respondent hire fewer legal professionals (Q11.1.2). This was denoted by a correlation coefficient ( $r = 0.188$ ,  $p < 0.01$ ). Again, the experience that the respondent had with using AI technologies could be a factor in explaining the lack of correlation with why the respondent would not advocate hiring less legal professionals. Deeper insight is needed to uncover why this is the case.

#### **4.4. Chapter Summary**

This chapter presented the research findings and the discussion of the data presented which explored four research objectives. Participation statistics were presented to discuss the demography of the respondents, what type of organisation they worked for, their seniority within the company, their job roles and the various job functions their organisation performed. These job functions were in congruence with the type of the tasks AI is currently performing in the legal industry today. Thereafter, questions were grouped in an effort to resolve the four research objectives.

Data was presented in tabular and graphical formats with all significant agreements being supported by statistical descriptors such as mean, standard deviation t-values and p-values. The data was used to satisfy the research objectives and was discussed in conjunction with the conceptual framework, which was presented in Figure 2.2. The conceptual framework presented a causal relationship between the availability of AI solutions, mediated by accurate, yield-producing software and moderated by its cost effectiveness to invoke a perception in the respondents that they and their law firms would hire fewer legal professionals. The linking of the objectives and the findings of the study via statistical analysis bolstered the conceptual framework. The next chapter concludes the research with the presentation of conclusions and recommendations for future studies.

# **CHAPTER FIVE**

## **Conclusions and Recommendations**

### **5.1 Introduction**

The commencement of the fourth industrial revolution which is seeing the widespread usage of technology such as robotics, automation solutions, AI, 3D printing, the Internet of Things and Nano-technology is expected to have structural and frictional unemployment impacts on a macro-economic scale (Parker & Thomson, 2016; Schwab, 2017). Their opinions, in conjunction with an article by Mills (2016), which details the advancement of AI and its growing use in the legal industry, provided the inspiration for embarking on this research study.

This chapter presents the conclusions and recommendations for the objectives highlighted in chapter 1 and whether these objectives were achieved through the use of a conceptual framework defined in chapter 2. The aim being to resolve the research problem of whether, awareness of the advancement and availability of accurate, substantial yield-producing, cost effective AI solutions in the legal industry would induce an opinion in legal professionals to invest in these technologies and hire less human legal professionals. The chapter also discusses the significance of the study for the various stakeholders and will conclude with recommendations for future research into the subject matter.

### **5.2 Conclusions and Recommendations**

The results presented and its subsequent discussion in the previous chapter provided pivotal insight upon which conclusions can be derived into perceived impacts of AI in the legal industry. Conclusions based on empirical and statistical findings have been drawn with respect to each of the objectives established and is discussed below with the purpose of determining whether the research question was answered.

#### **5.2.1 Objective 1: Awareness of advancement of AI in the legal industry**

##### **5.2.1.1 Conclusions for Objective 1**

The assessment of whether employees at sampled private law firms, legal publishers and legal departments at corporates were aware of the availability of legal AI solutions yielded varying results. There tended to be a general correlation to be aware of the advancements of AI solutions in the job functions that their companies performed. Further to this, there was a higher awareness

of AI solution in the job functions of legal research, legal document creation, and contract management. While there was awareness of advancements of case law treatment AI solutions, there was no acknowledgement of availability of such solutions. Larger proportions of the respondents were oblivious to the advancement and availability of AI solutions, which could perform job functions in Contract Analysis, Legal Advice, Case Outcome Prediction and Legislation Review and Commentary.

It can therefore be concluded that there was a higher proportion of respondents that were aware of legal AI solutions versus those that were unaware of the software, as well as there being a larger proportion who were aware of advancement versus availability of legal AI solutions. In addition, there was more awareness of AI software in a subset of the job function categories established in the questionnaire. The reason for this could not be determined by this quantitative study. Thus, the objective to determine awareness of advancement in AI solutions in the legal industry was achieved.

#### 5.2.1.2 Recommendations for Objective 1

Evidence in the literature review has showed a steady progression in the development of AI concepts and solutions over the last thirty years. AI can already perform a large amount of work performed by candidate attorneys and paralegals according to (Chui et al., 2015; Remus & Levy, 2015). Therefore, a steady rate of progression of this technology will eventually see the skill and capability gap close between software and human. This will have a substantial impact on professionals within the law fraternity.

It is recommended that legal professionals investigate the advancement and availability of AI solutions for the purposes of utilising it to strategically augment and bolster their job functions. The technology is advancing and professionals should embrace it for the purpose of intelligence amplification and combined effort, additional yield output, rather than ignore it or deny the inevitable. Awareness of AI progression and evolution can be attained by following what mega-tech companies are exploring, such as the likes of Google's DeepMind AI, Facebook's AI Research (FAIR) Lab, Amazon's Web Service Suite, Microsoft's Project Brainwave, IBM's Watson or Elon Musk's OpenAI. Education of more business type developments can be learned from the Big Four auditing consultant company viz. KPMG, PricewaterhouseCoopers, Deloitte



and Ernst & Young who are either partnering with or acquiring AI companies to develop business applications in the accounting and legal industries.

According to Boianovsky and Trautwein (2010), the trend of technology unemployment will see law firms adopting AI technology as forms of efficiency savings or speed of delivery realisation, thereby attaining sustainable competitive advantage over their competition and in turn their competitors adopting it as part of their strategic business catchup strategies. This can already be seen from (Mills, 2016). Therefore, the value of the recommendations is that legal professionals will be able to help their firms make educated recommendations with regards to the types of tooling that is available in the market and pertinent to their firm's success. This is more impactful, since the uptake of AI solutions in South Africa is in its infancy.

## **5.2.2 Objective 2: Usage of AI if it was accurate, quick and consistent to use**

### **5.2.2.1 Conclusions for Objective 2**

The analysis of the results in the previous chapter indicated that respondents agreed that they would advocate that their companies should invest in AI Solutions regardless of price, if it produced additional accurate work yield. The trend was supported regardless of whether respondents were aware of the availability of AI, whether they personally used AI tools or whether they were aware of its use elsewhere in their company. Again, the nature of the study did not lend itself to explaining why the respondents felt this way about advocating the use of potentially expensive AI solutions.

Emerging trends from the data analyses phase suggested that awareness of advancement and availability of legal AI software in the job functions of legal research, legal document creation, and contract management resulted in higher advocacy for the investment in this technologies in the same job function regardless of prices. Therefore, it can be inferred that awareness of AI solutions tended to highlight its benefits in the minds of the respondents. The second objective of the study was therefore achieved.

### **5.2.2.2 Recommendations for Objective 2**

While it is commendable to want to adopt new technology at the promise of it being more accurate, quicker and consistent, it would be prudent to know that is what one's company is getting. Recommendations in response to this objective would be to understand legal professionals' own processes, performance of competitors and what value is being offered by the AI software.

The purpose of this recommendation is to understand legal professionals company's current capability and strength in comparison to their competitors and finally to understand how AI would augment their company performance to provide additional value in terms of insight and/or improve their turn-around times. The investigation could take the following format.

- a. Determine which job functions or services provided by the company, lends itself to automation – i.e. jobs with definable, repetitive activities, as this is where the company would achieve its greater efficiencies.
- b. Utilise the services of a Six Sigma consultant to map out the job functions' processes to determine how the job is performed, if there is waste or obsolete steps in the process, where the AI would fit into the process as well as determining metrics around how long each job takes to complete and the accuracy of the output. An example of this exercise would be in the function of Legislative Research for a particular legal matter, which could have x-steps in the process, take y-minutes long and yields z-documents to help support the current legal matter being investigated. This exercise is important for comparison against competitors (if that competitive analysis could be attained) and the yield provided by the proposed AI software.
- c. Competitor analysis would then be conducted against the metrics derived in (b) above to determine the competitiveness of their offering with rates and pricing also being compared. This exercise would be valuable from corporate or business strategic perspective, even if the company decided not to embark on an AI journey.
- d. The exercise would continue with the investigation of whether there is AI software available on the market, which performs this job function. Software vendors have often partnered with law firms in order to develop case studies, which promote the performance and value of their software (Rosenthal, Timkovich & Cohen, 2014). Therefore, either engage with software vendors to embark on a proof of concept (POC) or select vendors who have available case studies which can be reviewed for the purposes of determining which AI software vendor and product to use.
- e. A legal matter is then selected as a case where the metrics defined in (b) above have been recorded and that job will be re-executed with the AI software included into the process where the human legal professional performed the job previously. The purpose being to

determine how the addition of the software has augmented the metrics obtained from the original case.

- f. Care should be taken to record how long it took to setup the software and whether this is a once off process, time taken to train the software and to determine whether this would be an ongoing consultative cost from the vendor. These additional exercises is for the purpose of the next objective in determining the total cost of ownership of the software product.
- g. Finally, one would compare the new metrics which were augmented by the AI software with that of previous results. It would be beneficial if this could be compared against a competitor case, but it is unlikely to be feasible to get this information from a competing law firm.

The value of this recommendation is that the legal professional begins to further understand the availability, capability and possible benefit of using AI software in their legal functions. It also allows their company to review their current processes and gives them visibility into whether they could add efficiencies by changing their processes or removing and reducing waste. This would yield benefits whether AI software was added to the process or not. Further value achieved is that the company embarks on a competitive analysis exercise, which is always an imperative of corporate or business strategy (Hough, Strickland, Gamble, & Thompson, 2011). Since AI software is cutting edge technology and as such, will no doubt be expensive, this recommendation provides a company looking to adopt such technology, with a quantitative process for assessing the viability and suitability of these products.

### **5.2.3 Objective 3: Usage of AI if it was affordable**

#### **5.2.3.1 Conclusions for Objective 3**

The analysis and discussions of the results in the chapter four indicated that there was a general agreement that legal professionals would advocate that their companies investing in AI Solutions if it produced additional accurate work yield while being cost-effective. The trend was supported regardless of whether respondents were aware of availability of AI or whether they personally used AI tools. The addition of cost effective AI solutions into the conceptual framework and the results observed during data analysis show that there was a consistent increase in the level of advocating the investment of AI solutions across all job functions. The reasons explaining why the respondents reacted in this manner could not be ascertained within the boundaries of this study and is a potential recommendation for further studies into this body of knowledge.

Another interesting trend to notice from the investigation of this objective is why legal practitioners were least confident that they would use yield-generating technology for the job function of providing legal advice. The investigation of this trend is also another candidate for recommendation for further research for any future studies into this subject matter.

It can therefore be concluded that objective three was achieved both by the conceptual framework being followed, price of AI solutions being proven as a moderating variable and finally, empirically by legal professionals advocating the use of legal AI solutions for the purposes of improving the quality of their companies service offerings and turn-around times.

#### 5.2.3.2 Recommendations for Objective 3

The recommendations stemming out of the conclusions for the third research objective is to conduct a cost benefit analysis as part of the feasibility study conducted in the recommendations for research objective 2 (see section 5.2.2.2).

As was advised in the section 5.2.2.2, care should be taken to record how long it took to setup the software and whether this is a once-off process, time to train the AI software, time to train staff on how to use it, and annual licensing and support costs. The aim is determine the total cost of ownership (TCO) with regards to acquiring this AI capability.

Strategic financial employees of the company could utilise Activity Based Costing (ABC) to holistically understand the costs of the job function as part of the feasibility study. These costs will include licensing, consulting, facilities, operational, human resource, administrative and training costs. An exercise in capital budgeting should be conducted where the company decides on investment criteria which are critical success factors in determining the suitability and viability of investing in these AI solutions. There are many success factors that can be utilised to determine the investment criteria when making decisions. Some of these could be (1) does the decision rule adjust for the time value of money (i.e. the appreciating or depreciating value of money based on interest rates and inflation); (2) does the decision rule adjust for risk in making the investment (3) does the decision rule provide guidance on whether value is being created for the organisation? (Firer, Ross, Westerfield, & Jordan, 2012).

There are several investment criteria that can be used and several should be considered and used in conjunction with one another when making the financial investment decision. Firer et al. (2012) suggest that the most common type of investment decision tools used in primary decision making

are Net Present Value (NPV) and Internal Rate of Return (IRR) as these satisfy the three decision rule criteria discussed above. Payback period is often utilised as a secondary investment criteria to determine when a company is likely to start earning a positive return on investment (Firer et al., 2012).

This recommendation however, only focuses on the financial value of using this technology. Other considerations are the advancement of technology and the general competitive trend of the legal market. Strategic business analysis theory leads businesses to believe that they need to continually survey the micro and macro-economic landscape to understand the forces that influence business competitive environments and industries (Venter & Van Rensburg, 2014). Thus, a PESTLE (observing trends in politics, economical, social, technological, legal and environmental areas of the business landscape ) analysis will very quickly surface AI in the Technology component of the analysis. As Mills and Uebergang (2017) explain, AI is a progressing trend in the legal industry in first world countries such as the United States and UK and is bound to eventually make its way to South Africa. It may be a consideration to adopt AI technology as a pioneering strategy or if other law firms start to adopt it and if it provides them with a competitive advantage.

#### **5.2.4 Objective 4: Impact on legal professionals at law firms and legal publishers**

##### **5.2.4.1 Conclusions for Objective 4**

The progression of the line of questioning in the research instrument was meant to test the strength of the conceptual framework formulated in Chapter 2, which in turn was culmination of the research objectives described in Chapter 1. Conclusions outlined for the first three objectives suggest that the objectives, which have been tested thus far, have been achieved with regards to understanding whether legal professionals would advocate in investing in accurate, consistent, quick, cost effective AI software if it was available.

The consensus was that legal professionals agreed that AI solutions were not yet mature enough to replace human legal professionals. Regardless of this sentiment, they felt that they and marginally more so, their companies, would hire *fewer* legal professionals presented with the opportunity of value-adding legal AI solutions. Half of the professionals surveyed believe that human beings are the foundation of any AI technology as human experts are the only mechanism of training machine-learning software and as such, will never be replaced by intelligent software.

The other half believed that AI capabilities could surpass human ingenuity and knowledge in as little as three years, but more likely, somewhere after ten years.

Further analysis showed that usage of AI solutions had no bearing on whether users would advocate the investment in using legal AI solutions or whether they would advocate hiring less legal professionals as a result of investing in new AI technology. The reasoning behind this outcome could not be explained within the remit of this study and is a candidate for recommendation in future studies.

In conclusion, the evidence proposes that all four-research objectives were achieved and the conceptual model (see Figure 2.2) held true. Awareness of the advancement and the availability of AI solutions did not seem to alter the opinion received in the survey with regards to suggesting investment into the technology; however, it did appear to increase the level of advocacy of the job functions where respondents were aware of available software. This leads to ‘awareness’ possibly being a further mediating variable in the conceptual framework.

#### 5.2.4.2 Recommendations for Objective 4

In Parker and Thomson (2016) recap of The World Economic Forum in Davos 2016, the loss of a total of 5 million jobs by 2020 due to the rate of technological progression was discussed. This structural unemployment will largely be attributed to the automation of repetitive or administrative jobs. Mills and Uebergang (2017) discuss how prolific AI has become in the legal industry and if the current rate of advancement of AI techniques continues, many legal jobs functions will be able to be accomplished by software. This study also revealed that legal professionals from various companies in Durban, KwaZulu-Natal are of the opinion that they themselves, and the companies which they work for, may hire less human lawyers if there was an availability of fast, accurate, consistent, cost-effective legal AI software, which could perform legal job functions.

The recommendations stemming from this final objective is two-fold. The first is for legal professionals to follow the trend of AI and AI in Law. The 16<sup>th</sup> International Conference of AI and Law (ICAIL) took place in 2017 and occurs every two years. This conference is a rich source of information concerning the advancement of AI in the industry of law. Previous recommendations also suggested following the Big Four auditing consulting firms for services that they provide with regards to AI solutions in the fields of auditing, accounting and law (Lacity, 2017; Tysiac, 2017). This knowledge can augment the skillsets of legal professionals to harness the power of AI and as

such bolster their legal expertise making them and their companies more progressive and ready to adapt to the onset of AI into the global economic environment.

The second recommendation is for South African tertiary institutions of higher learning to start incorporating the topics of AI and Law into its Law Degree curriculum as is the case at US universities, such as Harvard Law School and the University of Minnesota (Harvard Law School, 2017; University of Minnesota, 2017). The value of this recommendation can be realised in making students aware of the advancement of AI in the area of Law and how it will affect their lives given that the McKinsey report suggests that 69% of paralegals work and 23% of a lawyers work is automatable (Chui et al., 2015). Therefore, tertiary institutions need to produce a new breed of legal professionals who are *au fait* with classical legal training, as well as the technological advancement of AI.

### **5.3 Significance of the Findings**

The significance of the findings of this study is that, as of the writing of this dissertation, it is the first of its kind in the field of law. The direction of the study was based on the Theory of Technological Unemployment while the conceptual model created to underpin the study and the results attained from the research instrument strongly corroborate the existing theory. The study also uncovered from the sample of legal professionals in Durban, KwaZulu-Natal and by inference, to the rest of South Africa, that there was a general lack of awareness of the advancement and availability of legal AI solutions. There was a fair representation of candidate attorneys in the sample set which were not aware of the advancement of AI in Law, and given that these professionals had recently graduated from tertiary institutions of higher learning, suggests that these institutions are not discussing this relevant technology within their curriculum, a problem which needs remedying. Lastly, the importance of this study is fortified by the opinion of the professionals surveyed, that espoused the sentiment that there was a strong possibility that they and in their opinion, their companies would hire fewer legal professionals if there was the availability of an economic beneficial legal AI solution which produced accurate, consistent, yield-producing output.

### **5.4 Recommendations for Further Research**

The initial sampling technique was to utilise probability sampling for the express purposes of using statistical inference to represent the legal population in the South African context. It was difficult to get access to law firms or even an all-encompassing list of legal professionals to draw samples

from a sampling frame and ultimately non-probability sampling was employed. The suggestion for future studies is to approach and conduct studies in conjunction with legal associations such as the Law Society of South Africa (LSSA), Corporate Counsel Association of South (CCASA) and the South African Bar Association. This will help to obtain a representative sample for the purposes of the study.

Further recommendations is to conduct the survey in other geographical locations in South Africa, particularly in Gauteng where all the large law head offices can be found. The researcher could try to utilise law conferences as a platform to introduce the research and the significance thereof to legal professionals in the attempt to garner more support for the research. Comparisons could be drawn against the results obtained in Durban to see if there was differing opinions with regards to the subject matter.

Since the study followed awareness and sought opinion of respondents as to whether they would use AI technology in categories of job functions, it would be prudent to know if the respondents' opinion would be different when asking them if they would hire less legal professionals based on the job function. Examples of this would be to see if respondents would hire less legal professionals to perform the most widely performed job functions of legal research, legal document creation, and contract management versus that of the least performed of legal advice services.

Future studies could also be qualitative to uncover the following trends

- a. Why did respondents know more about job functions of legal research, legal document creation, and contract management versus the rest?
- b. Why were respondents oblivious to the advancement and availability of AI solutions, which could perform job functions in Contract Analysis, Legal Advice, Case Outcome Prediction and Legislation Review and Commentary?
- c. Why would respondents advocate usage of AI solutions regardless of price?
- d. Why would respondents advocate usage of AI solutions if it was cost effective?
- e. Why was there such a low confidence that AI solutions could/should provide Legal Advice?
- f. Why did not usage of AI solutions effect opinion of respondent to advocate investment of AI solutions?



- g. Why did respondents who did not use AI or weren't aware of AI advocate its use regardless of its cost?

## **5.5 Summary of Chapter**

The purpose of this study was to discover whether the availability of capable, consistent, cost effective AI technologies in the legal industry could lead to legal practitioners and their roles becoming redundant as AI solutions become more advanced. Four objectives were proposed in order for the research to reach its culmination. A conceptual framework was created based on literature reviews and in particular the Theory of Technological Unemployment. The conceptual framework was used to satisfy the research objectives and prove the underlying theory to be sound.

A deductive, quantitative, cross-sectional study was selected after assessing the benefits and drawbacks of various research methodologies and designs, by utilising the research 'onion'. Non-probability sampling (snowball sampling in particular) was selected to draw the research sample, which was meant to be a representation of the legal industry as close as possible. Survey data was used to gather opinion of legal professionals at private law firms, legal publishers and law departments within private corporations in Durban, KwaZulu-Natal, South Africa via self-administered hard and electronic research questionnaires. The data that was collected, analysed and discussed proved the conceptual framework to be true, the underlying theory to hold fast and all four objectives to be satisfied.

The chapter focused on the conclusions and recommendation of each objective of the study. The findings highlighted that respondents were aware of advancement in legal AI software more than they were of their availability, especially in the following job functions: legal research, legal document creation, and contract management. The findings further emphasised that legal professionals agreed in advocating for the investment of legal AI software if it was accurate, quick, consistent and more so if it was cost effective. Respondents also felt that AI was not mature enough to replace human legal professionals, but did feel that they and their companies would hire less legal professionals if advanced cost effective legal AI solutions were available.

The significance of the study was detailed referring to the need to educate the legal industry about AI technology trends which are occurring internationally and which have not yet reached South African shores. The outcomes also highlighted the need for tertiary educational institutions to add the topics of AI in Law in the education curriculum to create a new breed of techno-lawyer who

can keep up with the pace of the progression of the Fourth Industrial Revolution. The chapter and the study concluded with recommendations for future studies and focused around a deeper understanding as to why respondents held the opinions expressed in the survey.

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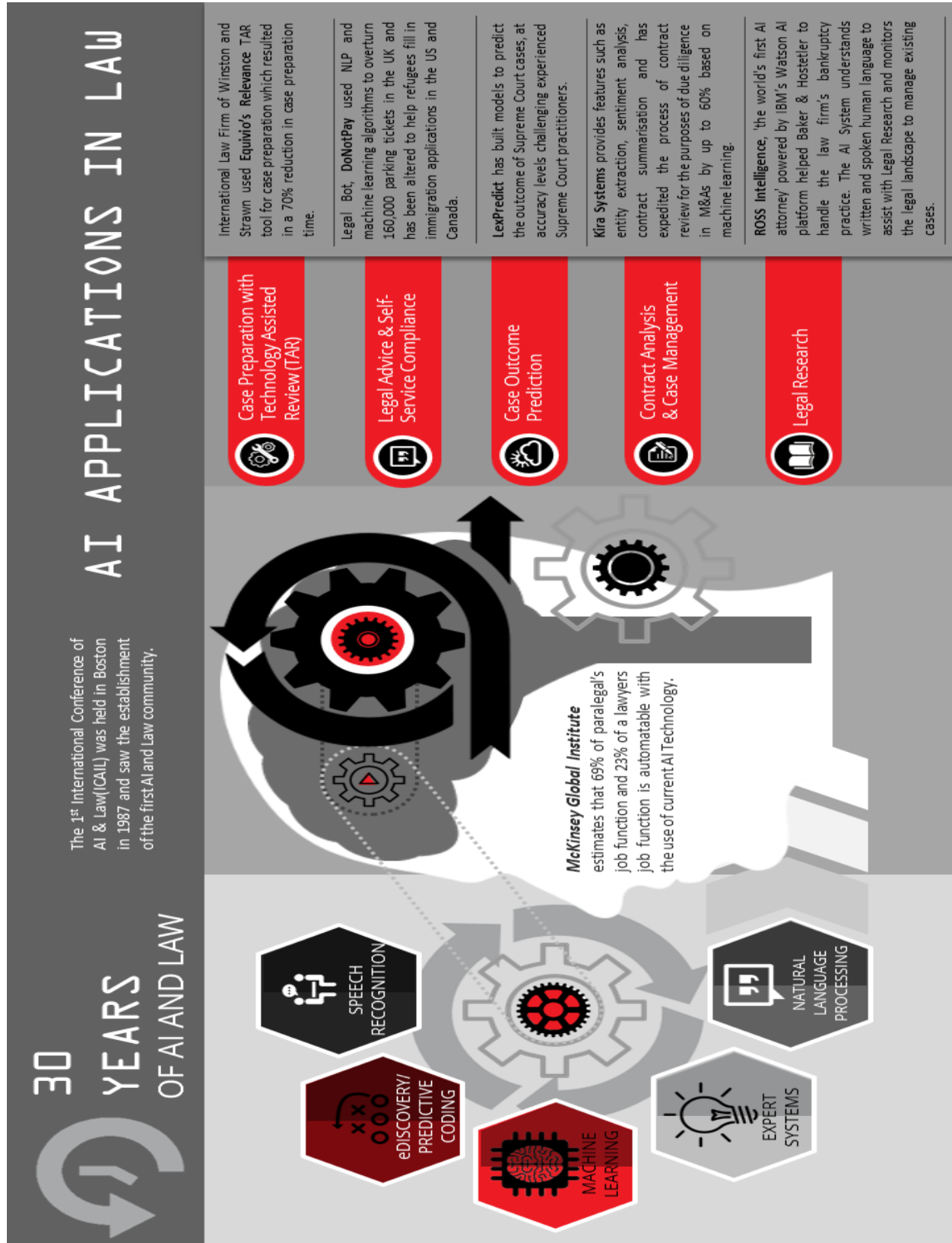
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## Appendix A: Research Infographic



## Appendix B: Letter of Approved Consent

UNIVERSITY OF KWAZULU-NATAL  
School of Management, IT and Governance

### Research Project

Researcher: Lee Adriaanse (Telephone number: 07168764392 (Email: [adriaansel@yahoo.com](mailto:adriaansel@yahoo.com))

Supervisor: Prof. Ziska Fields (Telephone number: 031 260 8103 (Email: [fields@ukzn.ac.za](mailto:fields@ukzn.ac.za))

Research Office: Humanities & Social Sciences Research Ethics Administration, Govan Mbeki Building,  
Westville Campus, Tel: + 27 (0)31 260 8350, Email: [hssreclms@ukzn.ac.za](mailto:hssreclms@ukzn.ac.za)

### CONSENT

I \_\_\_\_\_ (full names of participant)  
hereby confirm that I understand the contents of this document and the nature of the research project, and I consent to participating in the research project. I understand that I am at liberty to withdraw from the project at any time, should I so desire. Additional consent, where applicable

I hereby provide consent to:

Audio-record my interview / focus group discussion	YES / NO
Video-record my interview / focus group discussion	YES / NO
Use of my photographs for research purposes	YES / NO

\_\_\_\_\_  
Signature of Participant

\_\_\_\_\_  
Date

*This page is to be retained by researcher*

## Appendix C: Research Questionnaire

Dear Participant

The topic of AI and Law was officially established in Boston, U.S.A, 1987 at the International Conference of AI and Law (ICAIL) which unites the international leading subject matter experts in the field of AI and Law.

While the field and its research is approximately 30 years old, it is only due to the exponential growth in storage and computing capabilities that true Artificial Intelligence (AI) and Machine learning capabilities have been able to make an impact in the professional market. See infographic on 2<sup>nd</sup> page of this survey pack to understand the current capabilities of AI in the field of Law.

This questionnaire is part of a research project to understand legal professional's awareness of AI, which legal professional job functions it is currently performing, how well it is performing these tasks and whether this has an impact on the recruitment of various legal professional roles.

Ethical Clearance for this study has been obtained from the University of KwaZulu-Natal Ethics Committee and while your participation is extremely important to this field of study for the legal industry, participants are not obliged to complete this questionnaire. As bound by ethical consideration, note that confidentiality and anonymity will be ensured and the participant has the freedom to withdraw from participation at any point.

Please return the completed questionnaire to me, Lee Adriaanse or to the PA who delivered it to you by 30 September 2017. If you have any queries, feel free to contact me on 0716876492 or via email at [adriaansel@yahoo.com](mailto:adriaansel@yahoo.com)

Thank you for your help and participation

*LWAdriaanse*

Mr Lee Adriaanse

## Artificial Intelligence in Your Firm

We want to know about what your opinion is on the usage of AI in Law and if it would alter your hiring practices of legal professionals. Thank you.

### 1. Age

☐ 20 - 29   ☐ 30 – 39   ☐ 40 - 49   ☐ 50 - 59   ☐ 60+

### 2. Gender

☐ Male   ☐ Female

### 3. What type of company do you work for?

☐ Law Firm   ☐ Legal Publisher  
☐ Other

If Other, state Company Type

--

### 4. To which employee group do you belong?

☐ Senior Management/Executive   ☐ Middle Management  
☐ Supervisor   ☐ Staff

### 5. To which Job Role do you belong? (Tick all that apply)

5.1 Executive/ Director	
5.2 Partner	
5.3 Attorney/Fee Earner	
5.4 Candidate Attorney	
5.5 Company Secretary	
5.6 Para-legal	
5.7 Legal Researcher	
5.8 Editor	
5.9 Managing Researcher	
5.10 Other	

**6. My Company performs the following Job Functions (Tick all that apply)**

6.1 Legal Research	
6.2 Legal Document Creation	
6.3 Contract Management	
6.4 Contract Analysis	
6.5 Legal Advice	
6.6 Case Outcome Prediction	
6.7 Legislation Review and Commentary	
6.8 Case Law Treatment	

**7. Awareness of Artificial Intelligence in Law**

**Indicate your agreement with the following statements:**

7.1 I am aware of the advancements of AI Solutions in:

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
7.1.1 Legal Research					
7.1.2 Legal Document Creation					
7.1.3 Contract Management					
7.1.4 Contract Analysis					
7.1.5 Legal Advice					
7.1.6 Case Outcome Prediction					
7.1.7 Legislation Review and Commentary					
7.1.8 Case Law Treatment					

7.2 I am aware of the availability of AI Solutions in:

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
7.2.1 Legal Research					
7.2.2 Legal Document Creation					
7.2.3 Contract Management					
7.2.4 Contract Analysis					
7.2.5 Legal Advice					
7.2.6 Case Outcome Prediction					
7.2.7 Legislation Review and Commentary					
7.2.8 Case Law Treatment					

## 8. Utilisation of Artificial Intelligence Solutions – At Present

### 8.1 Indicate your personal usage of AI Solutions in your current job function

Never	Rarely	Sometimes	Often	Very often

### 8.2 Are you aware of the use of AI Solutions in other departments at your company?

Yes	No

## 9. Utilisation of Artificial Intelligence Solutions – Capability

Indicate your agreement that you would recommend that your company invest in AI Solutions in the following job functions *regardless of price*, if it helped legal professionals perform their jobs quicker and more accurately:

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
9.1 Legal Research					
9.2 Legal Document Creation					
9.3 Contract Management					
9.4 Contract Analysis					
9.5 Legal Advice					
9.6 Case Outcome Prediction					
9.7 Legislation Review and Commentary					
9.8 Case Law Treatment					

## 10. Utilisation of Artificial Intelligence Solutions – Affordability

Indicate your agreement that you would recommend that your company invest in AI Solutions in the following job functions to increase legal professional's productivity, if it was *quicker, more accurate and cost effective*:

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
10.1 Legal Research					
10.2 Legal Document Creation					
10.3 Contract Management					
10.4 Contract Analysis					
10.5 Legal Advice					
10.6 Case Outcome Prediction					
10.7 Legislation Review and Commentary					
10.8 Case Law Treatment					



## 11. Impact on Legal Professionals

### 11.1 Indicate your agreement with the following statements:

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
11.1.1 I believe that AI solutions <i>are not mature enough</i> yet to replace human legal professionals					
11.1.2 The availability of accurate, fast, consistent, and cost effective AI solutions <i>would</i> make <i>me</i> hire fewer legal professionals					
11.1.3 I am of the opinion that the availability of accurate, fast, consistent, and cost effective AI solutions <i>would</i> make <i>my company</i> hire fewer legal professionals					

### 11.2 Indicate your opinion on the number of years it will take for AI Solutions to replace lawyers

Under 3 years	3 - < 5 years	5 - < 10 years	10 years +	Never

## 12. Rate the extent of the influence that you have in the following areas:

	No influence at all 1	2	3	4	A great deal of influence 5
12.1 The usage of AI technology in the company					
12.2 The hiring behaviour in the company					

*This is the last page of the survey*

## Appendix D: Ethical Clearance Letter



27 September 2017

Mr Lee Adriaanse (961090611)  
Graduate School of Business & Leadership  
Westville Campus

Dear Mr Adriaanse,

Protocol reference number: HSS/1437/017M

Project title: The Impact of Artificial Intelligence (AI) Technologies on Legal Practitioners in Law Firms and Legal Publishers

### Approval Notification – Expedited Approval

In response to your application received on 11 August 2017, the Humanities & Social Sciences Research Ethics Committee has considered the abovementioned application and the protocol has been granted **FULL APPROVAL**.

Any alteration/s to the approved research protocol i.e. Questionnaire/Interview Schedule, Informed Consent Form, Title of the Project, Location of the Study, Research Approach and Methods must be reviewed and approved through the amendment/modification prior to its implementation. In case you have further queries, please quote the above reference number.

**PLEASE NOTE:** Research data should be securely stored in the discipline/department for a period of 5 years.

The ethical clearance certificate is only valid for a period of 3 years from the date of issue. Thereafter Recertification must be applied for on an annual basis.

I take this opportunity of wishing you everything of the best with your study.

Yours faithfully

Dr Shenuka Singh (Chair)

/ms

Cc Supervisor: Professor Ziska Fields  
Cc Academic Leader Research: Dr Muhammad Hoque  
Cc School Administrator: Ms Zarina Bullyraj

---

Humanities & Social Sciences Research Ethics Committee

Dr Shenuka Singh (Chair)

Westville Campus, Govan Mbeki Building

Postal Address: Private Bag X54001, Durban 4000

Telephone: +27 (0) 31 260 3587/8350/4557 Facsimile: +27 (0) 31 260 4609 Email: [ximbap@ukzn.ac.za](mailto:ximbap@ukzn.ac.za) / [snymanm@ukzn.ac.za](mailto:snymanm@ukzn.ac.za) / [mohunp@ukzn.ac.za](mailto:mohunp@ukzn.ac.za)

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## Appendix E: Turnitin Report Summary

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