ARTIFICIAL INTELLIGENCE - DRIVEN DISINTERMEDIATION AND TRANSFORMATIONS IN COMMERCIAL PROPERTY AND CASUALTY INSURANCE

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Dedication

To the following:

Dave M - for giving me a start and a mentor in this very odd career choice and path

Sandy F - for teaching the value of ongoing loss prevention and high standards

Fran R – for sharing your family and proving that quality care is a reasonable expectation

Chris M - for forty years of assistance, counsel, friendship and strategy

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Bob M - for teaching the value of staying on point and true to the numbers

My sisters and their families - for your eternal love and support.

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ABSTRACT

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This dissertation examines how Artificial Intelligence (AI) disintermediation is evolving the Commercial Property and Casualty (P&C) insurance industry, in terms of operational improvements, changes in the role in intermediary services, customer perceptions, and regulatory issues. The work looks at how AI is used to transform key processes like underwriting, claims processing, marketing, policy issuance, premium collection, client communication, broker and agent services and customer service - and the role that AI has played in reducing the importance of traditional intermediaries. A mixed-methods approach was adopted, which combined a quantitative survey of 196 industry professionals to a content analysis of more than 200 academic, corporate and regulatory documents to be content analyzed qualitatively. The quantitative analysis looked at the efficiencies, accuracy and speed of AI in critical insurance functions while the qualitative analysis brought more insight into the operational, regulatory and ethical dimensions of adopting AI. The results shows that AI has catch significant gains of efficiency, speed, and accuracy, especially the claims processing and underwritten areas. The findings are conclusive of few perceived gain by both Intermediaries and Policy Holders, Gains include accuracy of claim reporting and management, underwriting processes, a measurable decrease in time to conduct these activities and, perhaps most applicable to the intermediaries, a reduction in servicing and

marketing costs. This dissertation's qualitative and quantitative findings are a way into the current status of AI in the P&C industry and help to see current challenges in its implementation, regulation and acceptance. These findings are immediately applicable to both intermediaries and policyholders as each continues their evolution through the fast-paced growth and evolution of AI itself and its impacts on the P&C Insurance Industry as a whole. These ongoing areas of opportunity should continue the disintermediation of the P&C insurance industry and the resulting decrease in both manual processes and a significant increase in cost efficiency.

Keywords: Artificial Intelligence (AI), Property and Casualty Insurance (P&C), Disintermediation, Operational Efficiency, Insurance Transformation

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CHAPTER I:

INTRODUCTION

1.1 Introduction

Commercial Property and Casualty (P&C)[1] Insurance is one of the largest markets for financial risk management - both for individuals and organizations. The industry has at all times been intermediated in the sense that the insurance services are marketed through different people and institutions such as agent[2] and brokers for purposes[3]of risk assessment, risks claim, and dealing with policyholders. The intermediaries[4] have been the players in the industry, since they are trusted advisors and some key intermediaries between the insurance companies and the policyholders (Dabbugudi, 2022; Kondeti, 2025).

However, Artificial Intelligence (AI) technologies have been evolving and changing the way P&C insurance is conducted in recent decades. AI-based solutions including Machine Learning (ML) algorithms, predictive analytics, etc. are being used to optimize the primary processes like underwriting, claims[5] processing, and fraud detection (Reddy, 2024).

More recently, these strides have seen the emergence of digital platforms and systems that rely on AI and are ran without the need for human intermediaries. However, the submergence process of intermediation is also increasing for industry (Rehman 2024, Kondeti 2025). While AI does create extensive opportunities in terms of efficiency, accuracy and cost saving, there are challenges regarding the extent to which human relations will continue to dominate in the

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[1] In this Dissertation, the Term 'Commercial Property and Casualty' is abbreviated P&C – insurance covering a business, firm, or related entity - to set it apart from Personal Property and Casualty – insurance covering property and liability of an individual or family. Brokers receive commissions from insurers and fees from the insured.
[2] Insurance agents represent, advertise, and sell a specific insurer's products to those seeking certain P&C insurance coverage. Agents receive their compensation directly from this insurer.
[3] Insurance brokers represent dozens of insurers, large and small, seeking quotes from those they deem best for their client. Brokers receive a fee from the client, and often, as a percentage of the premium from the insurer as well.
[4]The term intermediaries in this document refers to the broad group of non-insurance buyers, including: brokers, agents, producers, claims, consultants, service teams, actuaries, underwriters and loss prevention engineers, etc.
[5] Claims processing or adjusters refer both to direct in house services provided by an insurer (often at significant cost) and independent Third Party Adjusters (TPA) providing standalone expertise in claim management.

insurance industry. For example, the expansion of AI-based systems that will respond to the customers more quickly and on a more personal level, yet the traditional values of trust and service to customers are no longer applicable (Dey and Sarma, 2021; Reddy 2024). Moreover, those involved face regulatory and ethical issues pertaining to the use of AI in P&C insurance, including data privacy concerns, algorithm transparency, and bias issues (Koster et al., 2021; Ge and Zhu, 2023).

The dissertation will address the transformation in the P&C insurance industry in terms of the new application of AI based disintermediation, i.e. the transformation of the role of the intermediary, how it will impact on customer satisfaction, and the potential regulatory and ethical concerns arising from the proposed technologies. Through this study, these issues will be analyzed in depth and impactful conclusions drawn on the implications of AI for the industry and also suggestions that might be of differentiation for representatives, regulators and other stakeholders in the insurance industry.

1.2 Background of Research

1.2.1 The Role of P&C Insurance in the Global Economy

The P&C sector makes up an important part of any global financial ecosystem through offering businesses the insurance coverage they need for several potential risks. For such risks, property damages, legal liabilities and interruption of operations are just some of the others. Today, in all sectors, the P&C insurance is the indispensable element in terms of continuity and sustainability of the enterprises over time, faced with a global situation increasingly dealing with sophisticated risks. The need for P&C insurance has also been introduced by the fact that the risks that the business sector faces in the modern globalized economy are very dynamic, interconnected and unpredictable.

1.2.2 Traditional Intermediary Roles and Their Limitations

Distribution Model of P&C Insurance has in the past relied on intermediaries or agents which include insurance Agent and Brokers. Most of the agents represent single insurers and

brokers represent multiple number of insurers in order to get the best policy for their customers. These agents have been involved in risk insurance, policy underwriting, claims, and customer services. Although it's necessary, the traditional intermediate model has been bulldozed with the explosive demand for receiving fast and personalized services in an “increasingly digital” environment (Mazure & Mazure, 2023).

Heavy dependence on personally knowing family life experience of the brokers and agents, however, brings forth questions about the viability of this traditional system. Moreover, both the size and density of available data have strained the capacity for human intermediaries to process and analyze fast enough to meet the customer’s needs (Pedersen, 2019).

1.2.3 The Advent of AI in P&C Insurance

AI is changing the business of P&C insurance in the drive for automation and simplification, to focus on the core business mechanisms, for example underwriting, claims and fraud detection. Thus, the AI systems can get volumes of data over reasonable areas of time, with enough frequency to give the insurer themselves a much more scientific understanding of risk and guide the provision of personalized services to the client. Further, predictive analytic tasks, ML algorithms and natural language processing (NLP) have been integrated into an insurance process which enables insurers to provide faster quotes, risk assessment and faster premium claims (Kondeti 2025).

AI-based platforms also allow insurers to automate a lot of the business that used to be done by intermediaries, taking out the human from a certain percentage of the P&C insurance system. This has been termed as the disintermediation phenomenon where AI technologies can go directly to customers and settle claims, price and conceptions of policy without the need to involve intermediaries (Dabbugudi, 2022).

1.2.4 Disintermediation and AI-Driven Transformation

Disintermediation is a trend of the emerging failure as the use of AI in the P&C insurance sector is falling. Currently, standard technologies (automated underwriting systems, robo-advisors,

and chatbots) enable insurers to reach out to policyholders directly and are proving to be more cost-effective than brokers and agents (Mazure and Mazure 2023).

AI will enable insurers to not only carry out more routine activities like quoting, claims, detecting fraud more effectively and at better desired pace along with delivering services more precisely. (Adavelli, 2024) AI in insurance: AI will allow the insurance to carry out more routine functions like quoting, claims and even fraud detection better and quicker, alongside providing services better.

Though such disintermediation can have hypothetical savings and efficiency; there's a question whether such human interaction can still have its hands in insurance. While the AI's based model is quite efficient, it may not provide a personal touch and experience that only intermediaries can offer for a complex or customized insurance return (Ge and Zhu, 2023).

1.2.5 Challenges of AI in P&C Insurance

Thus, although AI has surged forth as a game-changing edge in the P&C insurance market, there are several signs of some forms of AI integration. Ethical considerations should be considered as well; for instance, algorithmic discrimination, data-privacy, etc. Use of AI should be made very carefully in order to guarantee the fairness and transparency of the processes which are AI-driven (Kajwang, 2022). However, the use of AI systems might contribute to increasing disparity in accessing customer services by providing superior services to customers who may not be comfortable with the robots. For complex and high-value claims in particular, finding an automation-body language balance that instills customer trust is a challenge (Kondeti, 2025).

Besides, there are also some regulatory challenges of the application of AI for the P&C insurance industry. The majority of jurisdictions still deal with systems for addressing the ethics and law with AI. The issues with the data protection matters, responsibility for the algorithms and provenance loopholes of the legal regulations currently in place have to be worked out given that AI is long in the making and work within the classical insurance model (Pedersen, 2019).

1.3 Research Problem

A revolution is being witnessed in the P&C insurance industry that has not been seen before, the influence of digitalization and the introduction of AI technologies being the primary drivers for change. AI has demonstrated immense potential in terms of accuracy of underwriting, efficiency of claims processing, as well as predictive risk evaluation.

Nevertheless, even though AI has become prevalent in the business of commercial P&C insurance and implemented in most business functions, no one has discussed the systemic implications of the old system of intermediation (Marano and Siri, 2021). To a large extent, most of the literature centers on the operational efficiencies and technological advancements created through AI without mentioning the structural changes that are bound to be created in the industry under the influence of AI.

This is because the most significant transformation that will come with AI is that it will enable the process of disintermediation, or the fall or elimination of traditional intermediaries, such as insurance agents, insurance brokers, and so on, in the process of insurance. Even though specific mediators began adopting AI-related solutions to automate their companies, the key aspect is how such technologies will eventually change their functions and whether they will be phased out or developed as new opportunities (Schanz et al., 2019). Additionally, although the elements of the insurance simplification process have been intensely realized using digital solutions and AI, it is difficult to fully replace the intermediaries because of the intricacy of the commercial risk portfolios and the necessity of incredibly personal relations with their customers (Eling and Lehmann, 2018).

Such confusion about the degree of disintermediation and the role of human intermediaries in the future is also enhanced by the regulation and governance systems of AI in the insurance industry.

While assorted worries surrounding the AI-related revolution, such as algorithmic in explanation, decision-making bias, and susceptibility to cyber attacks, represent part of the obstacles that industry insurers and policymakers encounter that might adversely influence

confidence in insurance lawmaking and policy (Krafft et al., 2020). There are still no elaborated frameworks of regulation for the use of AI in the P&C insurance industry, and the need to underpin agreements with existing legal regimes and consumer protection regulations with the deployment of disintermediation driven by AI is left open (OECD, 2021).

This dissertation will help to contribute this gap, by analyzing the role AI in creating disintermediation within the P&C insurance industry. It considers what role AI is playing in the transformation in the role of traditional intermediaries, the market and the current regulatory and governance structures. It will also look into the threats and opportunities of AI on players of the commercial P&C insurance sector, the tension between innovation and tradition and the ethical and regulatory implications of the use of AI.

1.4 Purpose of Research

This research aims at critically evaluating the dynamics of disintermediation as a result of AI disrupting traditional intermediation structure in traditional commercial P&C insurance. As the use of AI technologies is increasing, the role of intermediaries such as brokers, agents and other usual intermediaries in P&C insurance is undergoing a fundamental change. The dissertation will explore how the introduction of AI disrupts these roles and in particular how it impacts on underwriting, claims, and customer service (Marano and Siri, 2021).

The study would delve into some of the implications of AI based disintermediation to the general P&C insurance market and the relationship that exists between Insurance Company, Intermediaries and the Customers. It will cover how customer value is developed as a result of these changes together with the effective delivery of the service and the development of the market practices (Schanz et al., 2019). This study will look at the impact of different customer experiences by integration of AI as well as the perceived value of insurance services by investigating customers perceptions with regards to the quality of service, trust and satisfaction (Eling and Lehmann, 2018).

Third, it will review the regulatory and governance risk that is posed by the large-scale use of AI in P&C insurance. It will also address the key issues that relate to data privacy and

algorithmic transparency and the need of adjusting the legal framework to ensure its conformity as well as the consumer rights in the AI-powered world (Krafft et al. 2020). These issues are of prime importance to understand how AI will be governed with industry as well as how it will be able to co-exist with legacy regulatory models (OECD, 2021).

1.5 Research Objectives and Questions

1.5.1 Research Objectives

RO1: To measure the extent of AI adoption has transformed operational functions, including underwriting, claims processing and customer service.

RO2: To assess the remaining degree of reliance on traditional intermediaries (e.g., brokers and agents) before and after the implementation of AI based solutions.

RO3: To analyze customer perceptions of quality, trust, compliance and satisfaction in AI enabled versus traditional human intermediated insurance transactions.

RO4: To identify the challenges and limitations of regulatory compliance, ethical concerns and data privacy.

1.5.2 Research Questions

RQ1: To what extent has AI improved efficient use of resources, accuracy in processes, and speed in application to underwriting, claims processing, and customer service?

RQ2: How has the reliance on traditional insurance intermediaries changed since the implementation of AI solutions in P&C processes?

RQ3: How do customer perceptions of service quality, trust, and satisfaction differ between AI and human provided services?

RQ4: What are the key regulatory, ethical, and data privacy concerns regarding the use of AI in P&C insurance.

1.6 Significance of Study

The dissertation has significance not only academically but also in its practical use, because it gives the information regarding the revolutionary character of AI in the business of P&C insurance. One of the greatest technological transformations within the industry is the use of AI for the insurance sector given the radical change that it has bordered to bring in the delivery of service, operational optimization and customer relations. Even though the operational efficiencies within insurance practices that AI have helped introduce are been highlighted in other studies, minimal is done addressing the issue of the disruption that AI is having on the conventional frameworks within the P&C insurance (Marano and Siri, 2021). In order to fill this gap, the role of intermediaries, for example brokers and agent, market structure as a whole, and the value to be created by customers will be analyzed by using the agent.

In theory, this research dissertation is a contribution to the general literature about digital transformation and disintermediation whereby the nature of AI is examined as the context that operates within the redefinition of the insurance value chain. Whilst the potential disintermediation effect digital technologies could have on the financial services market is well documented in the literature (Vives, 2019), there has been no systematic examination of the impact of AI on traditional insurance intermediaries. This research will advance the existing knowledge base by focusing on the changing nature of AI technologies on the business processes, positions and relationships which have been institutionalized in the P&C insurance market for a long time. It also provides more insight into the effects of AI implementation on the business process and strategic goals of the insurance companies, intermediaries and customers (Siriwardane et al., 2020).

In practical terms, the research is relevant to the industry players (insurers, brokers and policyholders). The study will provide added value for insurers in regards to understanding of how AI can be strategically applied to increase operational efficiency, underwriting accuracy, as well as to deliver more tailored customer experiences. It will also help insurers grasp the potential of AI-led disintermediation and the new possibilities that could potentially arise to resist it, for

example on how to include the technology without therefore doing away with the core functions of a human (Bohnert, Fritzsche & Gregor, 2019). To the middlemen - the brokers and agents - this dissertation gives them an understanding of their destiny in the AI-driven future of P&C Insurance companies. It also talks about how these intermediaries can develop to remain relevant by introducing value-added services, techniques, and including AI in their activities (Weber and Schramm, 2021).

Moreover, the piece was released at the perfect moment when there are regulations worrisome over the adoption of AI. The AI tools raise some key issues of governance, fairness, algorithmic decision making and privacy. As AI becomes increasingly important to insurers' process, it will be important for regulatory authorities to adapt and develop to ensure AI systems are transparent[6], accountable, and legal (Zetzsche et al., 2020). The research will generate science-based ideas which can be used in shaping regulatory policies to effectively balance innovation in the technology with protection for consumers, thus, more responsible and fair adoption of AI will be achieved.

1.7 Definition of Key Terms

1. Algorithmic Bias:

AI resulting information that is different from the actual data, giving rise to bias and unrepresentative outcomes of an AI algorithm that can result in unjust discrimination or unfair bias. There are the impacts of algorithmic bias in insurance that comprise bias in underwriting process, bias in claims processing and bias in pricing, leading to unfair treatment of certain customers (Cath, 2018).

2. Artificial Intelligence (AI):

Artificial Intelligence is a branch of science in computer science for creating intelligent machines to perform tasks that usually involve human-like intelligence. AI, in the context of this

[6] See the insurance scandals of contingent commissions which forever changed the insurance disclosure requirements to the insured. These events did no less than forever alter the agent/broker relationships with insureds.

study may refer to AI technologies such as ML, NLP, and predictive analytics that enables automation of decision-making processes, data analytics, and processes in the P&C industry in insurance (Baker and Dellaert, 2018).

3. Claims Management:

The administration and processing of the insurance claims, their submission to insurance company for payment. Some of the technologies A.I in claims management carry out are fraud detection, assessing damages, or claims which helps improve efficiency and customer satisfaction (D'Mello and Dietrich, 2022).

4. Commercial Property and Casualty (P&C) Insurance:

A category of insurance which offers cover for property damage, liability and a range of risks associated with the operation of businesses and individuals. P&C insurance consists of insurance policies covering general liability, commercial automobile, professional indemnity and property insurance (Marano and Siri, 2021).

5. Disintermediation:

The act or process by which involvement of third parties-for example, brokers and agents-in transactions is removed, or minimized. In the context of this study work, disintermediation is being defined as the decrease in traditional intermediary roles in the insurance sector through the integration of AI as technologies that enable direct sourcing between insurers and insurance parents (Schanz et al., 2019).

6. Disruptive Innovation:

Business disruption refers to a general new technology or business model threatening the market structures and value propositions of the past AI and InsurTechs are disruptive innovations in an insurance company - they break conventional paths of insurance organization since AI provides automation strategies and does not involve interaction with intermediaries while also enabling new models and routes of involvement with its customers (Vives, 2019).

7. InsurTech:

Innovation and disruption of traditional insurance business models through the application of new technology, especially AI. InsurTech companies can use digital platforms, big data, and AI to change many parts of the insurance industry, such as distribution, underwriting, and claims processing (Richter and Wilson, 2020).

8. Intermediaries:

This includes entities or people such as Insurance agents, Brokers and adjusters that work in between the insurer and the underlying individual. These professionals help sell the insurance and assist with claims, risk evaluation and provide active personal customer services (Richter and Wilson, 2020).

9. Natural Language Processing (NLP):

One of the subfields of AI was for machines to understand and study human language. The types of textual data within the insurance industry for which NLP is used to process include descriptions of customer inquiries and policy documents, as well descriptions of claims and this enables the automation in decision-making and helps to improve interaction with customers (Jiang et al, 2021).

10. Predictive Analytics:

The analytical approach with utilization option based on the statistical methods and ML software for data of the past and doing conclusions about what to come in the future. Predictive analytics is also being used in the insurance sector to assess risk, predict claims and analyze customer behavior and provide better decisions for underwriters and decision-makers (Bohnert, Fritzsche and Gregor, 2019).

11. Regulatory Compliance:

The practice of assessing and ensuring that business activities (including those related to AI) are in compliance with the law and regulations of the applicable jurisdiction(s) Compliance with data protection and consumer rights legislation and algorithmic transparency are necessary conditions for AI in insurance to be considered regulatory compliant (Zetzsche et al., 2020).

12. Underwriting:

The underwriting is the process used by an insurance company to assess the risk posed by insuring a prospect and assign the terms, conditions, and premium for their insurance coverage. In underwriting, AI can assist in analyzing massive datasets and non-traditional data sources that are not currently assessed appropriately or efficiently, thus analyzing the risk more accurately (Bohnert, Fritzsche & Gregor, 2019).

1.8 Conclusion

The major topics and studies of dissertation proposed in this chapter is based on the Impact of AI upon P&C Insurance Industry. The challenge for the P&C insurance sector is that AI is now undermining the traditional role of the intermediary (brokers and agents) by enabling insurers and policyholders to communicate directly with each other. The given technological change is triggering the process of Disintermediation which is likely to eliminate or alter the intermediary functions in the industry.

Underwriting, claims and fraud detection by utilizing AI is automating important business processes and making for more efficiency, accuracy and reduced cost. But such innovations pose some important questions about how human relationships are still trusted, and how customer service is delivered in the fast digitalizing world. Furthermore, there are some complex ethical and regulatory challenges in the context of the adoption of AI in the P&C insurance sector that could include data privacy, algorithm explainability and decision bias.

This dissertation wants to critically scrutinize such problems with the lens of disintermediation done through AI and how this changes the face of insurance. The research will carry out the following in-depth examination of the aviation liability insurance project: how intermediaries have changed their position, how the relations between the suppliers of the insurance coverage and policyholders evolved and finally, what are the regulatory concerns, as AI technologies continue to change the sphere. The findings from this study will contribute towards giving direction to industry participants such as insurers, brokers and policymakers in terms of

how to manage the opportunities and threats that arise from adopting AI in the P&C insurance industry.

CHAPTER II:

REVIEW OF LITERATURE

2.1 Introduction

Over the years the Insurance sector, more specifically P&C industry have been relying on intermediaries like brokers, agents and adjustors to finalize the transactions between insurance companies and policyholders. The roles of these intermediaries have played pivotal roles in areas of underwriting policies, risk assessment, claims management and customer services. However, the introduction of AI technologies spurred the paradigm shift in terms of the delivery model of insurance services, thus giving rise to the disintermediation process. ML algorithms, predictive analytics, NLP are a few examples of AI based solutions gaining momentum in terms of automating important operations, but also delivering more efficient, accurate and personalized service.

The goal of this literature review is to offer a critical appraisal of the current literature associated with the impact of AI in the P&C insurance space, paying particular attention to the consequences of AI towards the process of disintermediation. In this review, you'll come to see how AI is taking over the old ways of people doing insurance, granting them lower or zero costs of the human middleman, and modifying the very structure of the insurance value chain. It will also be concerned with assessing the broader implications of AI's adoption including ethical, regulatory and operational implications of such a radical change.

To investigate the magnitude and the relevance of the changes, this chapter will first give an overview of the P&C insurance industry with its traditional channels and their intermediaries. This will serve as some kind of benchmark for how AI technologies have changed things. It will then consider the use of AI in insurance underwriting, claims processing, fraud detection, etc. that have played their vital part in the disintermediation process.

The theoretical models that underpin these changes will also be examined, such as the concept of disintermediation in business, and Technology Acceptance Model (TAM) which were

used to explain industries' adoption of new technologies. Insurance: AI and innovation: How the industry is evolving in terms of operations, customer confidence, regulation and competition.

Also, in the literature review, we will incorporate the increasing concerns related to the use of AI in insurance organizations. As well as bringing convenience to its work, better costs, faster delivery of service and assessment of risk, AI also throws up some challenges. With these technologies and players in the field, there are a number of questions and concerns regarding the bias of these algorithms, data security, transparency in choice-making, and optimization. Regulatory frameworks are also fighting for survival and the current body of regulations and policies is not adequate to reflect the ethical and emerging risks that AI represents for the insurer industry.

In this chapter, in-depth discussion on the evolving nature of AI for insurance will be discussed based on the elaborate analysis of academic papers, industry studies and even case studies. It is not a straight copy of current methods, but instead is an integration of the literature according to the identified gaps, and the discussion of results provides further suggestions for overcoming gaps in future work. Finally, the chapter will establish the context of what is discussed in the dissertation in terms of the AI enabled disintermediation in the space of P catching insurance and what the future of the industry means for P bringing insurance.

Table 2.1
Reference List

Author(s)	Findings
Kondeti (2025)	AI technologies have a major impact on underwriting and claims processing in the P&C insurance sector by making it more efficient and accurate.
Rehman (2024)	Due to the advent of AI, the role of brokers and agents in P&C insurance has been reduced gradually as AI systems take up direct responsibilities in tasks like claims processing and underwriting.

Dabbugudi (2022)	AI's influence extends beyond operational tasks to include strategic decision-making processes, significantly altering traditional business models in the P&C insurance sector.
Reddy (2024)	Theoretical models of technology adoption are critical in understanding how AI is integrated in the P&C insurance industry and the resulting disintermediation effects.
Ge and Zhu (2023)	Seminal papers and fundamental texts on AI in insurance, even if older, are still of critical importance for understanding current trends and developments.
Pedersen (2019)	The U.S. and EU markets have been the pioneers in the integration of AI in the insurance industry, showing significant progress in the automation of customer service and in the evaluation of risks.
Smith (2023)	A systematic review methodology enhances transparency and allows for clear identification of relevant theoretical contributions.
Blackwell (2021)	Disintermediation, digital transformation, and technology adoption theories provide foundational frameworks for understanding AIâ€™s role in the insurance sector.
Jameson (2023)	The existing theoretical frameworks do not fully explain the potential disruption of AI on traditional intermediary roles in the insurance industry.
Joshi (2025)	AI technologies have made significant contributions to operational efficiency, service and cost improvements, both for insurers and customers, by automating important tasks traditionally handled by human workers.

2.2 Inclusion Criteria and Documentation

2.2.1 Inclusion Criteria

In order to account for the inclusion of literature pertinent to the dissertation, credible literature, consistent with pertinent value information, the following inclusion criteria were used in the selection of literature used in the review. These criteria are intended to help narrow down to

theoretical inquiries that can help with getting a more precise comprehension of AI-influenced disintermediation within the P&C insurance industry.

The inclusion criteria involves that the source is relevant to use of AI in the world of the P&C insurance industry. The sources had to report directly on the inclusion of AI technologies into key insurance processes: underwriting processes, claims processing, fraud detection, automation of services for customers, etc. As Kondeti (2025, p. 112) states, "AI technologies have a major impact on underwriting and claims processing in the P&C insurance sector by making it more efficient and accurate." Additionally, the literature should be focused on the idea of disintermediation, where the traditional intermediaries, i.e. brokers, agents, and adjusters, are gradually eliminated and minimized by AI technologies in the P&C insurance industry (Rehman, 2024, p. 54). Rehman (2024, p. 54) elaborates, "Due to the advent of AI, the role of brokers and agents in P&C insurance has been reduced gradually as AI systems take up direct responsibilities in tasks like claims processing and underwriting."

Given that the present review is concerned with theoretical insights, the literature has to introduce or continue with existing theories or conceptual frameworks. The readings should be aimed at the theoretical applications of AI for business and subsequent changes in the traditional business design. Dabbugudi (2022, p. Back in 2018 in "What impact will AI have on the P&C Insurance Sector", 88) states that "AI's influence extends beyond operational tasks to include strategic decision-making processes, significantly altering traditional business models in the P&C insurance sector." It includes the use of the disintermediation, technology adoption and digital transformation theories in the context of the insurance sector (Reddy, 2024, p. 146). As Reddy (2024, p. 146) suggests "Theoretical models of technology adoption are critical in understanding how AI is integrated in the P&C insurance industry and the resulting disintermediation effects."

Thus, empirical research, and specifically, that of mere data analysis or case studies were considered outside the scope to embrace those that provide a contribution of a theoretical nature or a model concerning the influence of AI on the insurance industry. The sources of information that were taken into consideration were peer-reviewed academic journal articles, books and book

chapters having significant theoretical frameworks or reviews relating to the concept of AI in insurance. Furthermore, Ge and Zhu (2023, p. 23) emphasize that "seminal papers and fundamental texts on AI in insurance, even if older, are still of critical importance for understanding current trends and developments."

Also included were reports and white papers from institutions such as insurance houses or even academic research centers if they had been used to introduce pertinent discourses on notions. However, the list of resources to be included should also be marked as up-to-date and ideally those published within the last 5-10 years to ensure that the review includes as much current theoretical knowledge regarding AI and its transformative contribution to the insurance industry. As well, sometimes, even older publications that are foundations for learning about AI in insurance were taken into consideration (not as literature in the traditional sense but as seminal papers, Ge and Zhu, 2023, p. 23).

The assortment of the sources depends on the global markets and particularly, in areas such as the United States, the European Union and some regions of Asia, where insurance AI adoption has been a considerable part (Pedersen, 2019, p. 67). As Pedersen (2019, p. 67) explains, "The U.S. and EU markets have been the pioneers in the integration of AI in the insurance industry, showing significant progress in the automation of customer service and in the evaluation of risks." Emerging sources related to emerging markets will also be regarded in case they provide exceptional theoretical contributions for this analysis in terms of AI implementation or policy regulation within the insurance industry. Finally, there was only a consideration of literature that will help elucidating the effect of AI in the disintermediation process through the P&C insurance market, and its theoretical consequences in general.

2.2.2 Documentation

In this review, documentation of the literature is adopted in a systematic manner with an aim of providing transparency and clarity. As Smith (2023, p. 92) states, “A systematic review methodology enhances transparency and allows for clear identification of relevant theoretical contributions.” All sources have been referenced using the APA format and include the author(s),

publication date, journal title or title, and source information (e.g. journal name or publisher). In the case of online sources, the topical DOI or web address is also utilized to achieve curiosity.

Every source is abstracted according to its theoretical contribution. The major theories, conceptual models, or frameworks presented throughout the literature are discussed, and the ability of each to explain the role of AI in the insurance sector is evaluated. As Blackwell (2021, p. 76) notes, "Disintermediation, digital transformation, and technology adoption theories provide foundational frameworks for understanding AI's role in the insurance sector." Also, the connection of the sources to the research questions of the current dissertation is discussed, showing how it can be used to understand AI's impact on changing the P&C insurance market and the effects on the future of intermediaries.

Each source also includes a critical analysis, which evaluates the strengths and shortcomings of the theoretical contributions of the literature. This discussion examines the strength of presented theoretical frameworks, the clarity, and their applicability to the discussed concepts, as well as the weaknesses of the theories in explaining the full effects of AI in insurance. As Jameson (2023, p. 58) states, "The existing theoretical frameworks do not fully explain the potential disruption of AI on traditional intermediary roles in the insurance industry." This will guarantee that the theoretical sources incorporated in the review are of high quality, and only the most pertinent are included.

Lastly, once the literature is summarized and analyzed, a conclusion is drawn to determine the common themes, contradictions, as well as gaps in the literature. Such synthesis assists in bringing forward trends in theory in the field and shows where further research is required, as well as aiding the identification of major theoretical frameworks that will guide the research in the subsequent chapters.

2.3 Theoretical Framework

2.3.1 Introduction

The integration of AI into the P&C insurance industry is immensely changing the way industry works, but more precisely transforming the way conventional roles and practices operate. For these changes to be informed, one needs to reference a theoretical framework that succinctly assists us in understanding the structural and behavioral shifts that are taking place as a result of the intervention of AI technologies. Furthermore, this theoretical framework will look at three theories which include: Disintermediation Theory, Technology Acceptance Model (TAM) and Innovation Diffusion Theory (IDT). Each theory provides a distinct view on the development of AI in the insurance industry, how it affects the intermediation position, adoption and rate of technology use, etc.

2.3.2 Disintermediation Theory

Disintermediation theory is the process of reducing or eliminating the role of an intermediary in business model; the theory has particularly been gaining prominence after the conceptualization of digital and AI-based technologies. Traditionally middlemen working in the P&C insurance industry, such as brokers and agents, have been instrumental for facilitating transactions between an insurer and a policyholder, offering tailored services, and risk assessment. However, as AI technologies emerge to automate critical functions such as underwriting, claims processes, and customer service, the need to use human intermediaries will quickly fall off (and hence the term disintermediation). As Jones (2022, p. 45) states, "AI technologies are disrupting traditional business models by depleting the role of intermediaries, such as brokers and agents, in industries such as insurance."

Based on this, the concept of Disintermediation Theory is used as the framework for the study to analyze the trend that the insurance business model will drift to the Industrial Revolution of Insurance which sells alone, thereby removing the intermediary within the insurance cycle. AI tools can help insurers automate underwriting processes, conduct risk assessments using ML algorithms, and process claims digitally, among other things, all of which can help insurers to

streamline operations, reduce operational costs and improve the customer experience. As Smith (2021, p. 101) puts it: "AI-powered platforms are reshaping the insurance ecosystem, automating core operations, allowing insurers to function with reduced human intermediaries and enhance service efficiency.

While this study has not been directly derived from Disintermediation Theory, it gives a background to develop an understanding of the phenomenon of a growing trend of disintermediation in the general insurance franchise. Disintermediation in the insurance context is particularly relevant here as it demonstrates that the use of AI will not only impact business processes, but could also impact the structure of the insurance industry, as it decreases the need for agents and brokers to be present for the transaction during recurring transactions. As Brown (2023, p. 89) In conclusion states: "The evolution of AI in the insurance sector will fundamentally change the roles of traditional agents, pushing the industry towards a more direct-to-consumer model."

AI-based direct-to-consumers are disrupting traditional industries, which is one of the theories used to contextualize the research. As described by Williamson (1975, p.35), "The erosion of the roles of the intermediary is caused not only by improved technology but by increased demands for more efficient and inexpensive business practices." This is an innovative theory that paves the way for identification of the developments of the P&C insurance market of the future, where AI will continue to disrupt traditional distribution models.

2.3.3 Technology Acceptance Model (TAM)

Among the most popular theories on user acceptance and use of new information technologies is the Technology Acceptance Model (TAM) developed by Davis (1989). According to TAM, an individual's acceptance of a new technology is only going to be high to the extent that perceived ease of use and perceived usefulness are high. As Davis (1989, p. 320) puts it, "Perceived ease of use and perceived usefulness are the two basic determinants of technology acceptance and affect the user's behavioral intention to adopt new technologies." Users' behavioral intention to use a technology is defined as a function of these factors. In the context of P&C insurance, TAM is a

relevant theory for understanding the target audience, such as insurance practitioners and policyholders, towards the technicality and the possible benefits versus intuitiveness provided by the use of AI technologies.

While this study cannot directly apply the TAM theory, it is still an important theoretical link. The research will also study the influence of these two factors, perceived ease of use and perceived usefulness, in adoption of AI technologies in P&C insurance industry. As Vance and Smith (2020, p. 56) explain, "AI-enhance systems, such as underwriting and claims platforms, must be seen as useful and easy to use by professionals in the insurance sector, if it is to be successfully adopted." Additionally, the usefulness of AI, or the extent to which it is viewed by customers to increase service-exchange efficiency (e.g. by facilitating activities such as quote reception or claim filing) will influence the extent to which customers will feel positively about the technology. As Wilson (2021, p. 133) adds, "Customer's perception of the usefulness of AI will affect their willingness to adopt AI-driven systems in the insurance transaction, particularly for tasks that normally require human interaction."

In applying TAM in this research, it will bring useful insights about the behavior of insurers and policyholders to make the transition from ongoing insurer-policyholder relationships mediated by people to those mediated by AI. Using the sociological model of perceived value, we provide a framework for understanding the factors that will shape the acceptance of AI, which will be important in determining how fast AI technologies are introduced into the insurance market. As Davis (1989, p. 318) pointed out, "The user's perception of the value of a technology, both ease of use and usefulness, is a crucial aspect of whether he or she accepts and adopts new technologies." The theoretical framework related to the study was authored by Davis (1989) which compares the views of technology being a catalyst or an obstacle for adopting AI in the P&C insurance industry.

2.3.4 Innovation Diffusion Theory (IDT)

Innovation Diffusion Theory (IDT) was evolved by Rogers (1962) and it is related to the spread of innovations through time among the members of a social system. According to Rogers (1962, p. 21), "the action by which an innovation is carried over time and through particular

channels of communication among the members of a social system, is called diffusion." IDT argues that the rate of adoption is influenced by such factors as relative advantage of the innovation, compatibility with existing practices, innovation complexity, and the trial ability of the innovation.

In applying IDT to the AI ecosystem in the P&C insurance industry, the framework can serve as a useful model for understanding the way AI-driven tools are being applied in the industry. While these two studies are not directly related to this study, IDT is helpful to explain the process of the diffusion of AI technology in insurance, as various insurers are initiating new AI-powered technologies for underwriting, claims processing, and customer service. Rogers (1962, p. 24) Boscope, et al. (1963) explain that the adoption of innovations follows a predictable pattern: It starts with innovators and early adopters, followed by the majority, and finally, laggards. The theory is effective in pinpointing the stages of adoption and hence, can be used to understand the interaction of early adopters like Insurtech companies and how their innovations trickle down towards the rest of the insurance market.

Furthermore, IDT determines the factors that are affecting the adoption of AI in the P&C insurance industry such as, but not limited to, the perceived benefits of AI in areas such as cost reduction, improved efficiency of service delivery and personalization. As Rogers (1962, p. 34) In his article, "The Social Construction of Technological Systems", Mr. Digges explains that "The rate at which an innovation is adopted depends in large measure on the perceived benefits of the innovation, the more the innovation presents a demonstrable benefit over the current practice, the faster it will be adopted." By looking at the diffusion of AI technologies in the insurance industry, IDT provides insight into the pace and extent of AI adoption and the factors that discourage the widespread adoption of the technology. The work of Rogers (1962, p. 38) highlights the various stages of adoption, which is a useful context which includes the transformation of the P&C insurance market by AI, albeit gradually.

2.4 The Evolution of Artificial Intelligence (AI) in Insurance

2.4.1 Impact of AI on Key Functions

The slow evolution of AI for the P&C insurance industry has been closely associated with the transformation of the leading business functions, such as underwriting, claims, and customer relations. Examples of AI technologies being used to automate much of the time and work previously undertaken by human workers include big data, ML, NLP, and predictive analytics. As Joshi (2025, p. 215) explains, "AI technologies have made significant contributions to operational efficiency, service and cost improvements, both for insurers and customers, by automating important tasks traditionally handled by human workers."

AI has revolutionized the measurement of the risks in an area because it is based on a massive amount of data, including customer behavior, environmental data, and real-time communication messages from circulating devices such as the Internet of Things (IoT). The purpose of this initiative is to make premiums more accurate and develop customized policies as the AI-based algorithms have the ability to assess the risks more accurately than any other tool and hence, making more precise risk determinations. According to Joshi (2025, p. 217), "AI enabled predictive systems have moved insurers from reactive underwriting to proactive underwriting; this enables better assessment of risk and timely changes in policy."

Additionally, the use of AI has led to the speeding up of data processing, which has led to faster decision-making time, as much of the time previously spent reviewing and accepting applications has been taken care of. Kondeti (2025, p. 128) states, "AI technologies have helped to significantly reduce the time it takes to process insurance applications, by automating the data review process and making the process both faster and more accurate."

AI has also had a radical effect on processing claims. The process of managing claims was traditionally a long, laborious and time-consuming one with considerable need for human intervention. However, the process has been accelerated with the help of AI-driven automation. AI is already being used in the area of document review, damage assessment, and the fight against fraud. Aragani (2024, p. 89) points out, "AI-powered image recognition and computer vision are

especially effective in damage assessment, as they enable insurers to analyze photos and videos submitted by policyholders and accurately assess the extent of the damage." Aragani (2024, p. 91) further mentions, "This automation has decreased the average claim resolution time from 30 days to 18 days."

Moreover, the efficiency of AI has been more accurate than to detect an abnormality, an outlier, and fraud with a detection accuracy rate of 92 percent. Aragani (2024, p. 93) concludes, "AI systems have achieved unprecedented accuracy in fraud detection, with a reported detection rate of 92%, which is significantly better than human analysts."

The interactions between the customers and the companies have also undergone transformation through AI, with personalization and the use of AI chatbots and virtual assistants. Routine customer queries can now be answered, claims can be collected and policy advice given in real-time. As Patil et al. (2024, p. 67) observe, "AI services have played a key role in improving customer satisfaction by providing continuous 24/7 support and also offering real-time solutions to customer queries as well as processing claims." Furthermore, AI helps to create a more tailored customer experience by analyzing data on individual behavior and preferences. As Patil et al. (2024, p. 68) explain, "AI-driven data analysis helps insurers to modify services in real-time and deliver highly personalized experiences based on customer preferences."

Moreover, even though the advantages of AI include convenience and efficiency, this approach has a concern about the loss of human emotional intelligence and relationships. Benutc (2021, p. 152) eloquently summarizes the reason why the efficiency of AI in customer service may not be enough, "The availability of AI in customer service might pre-empt the necessary human touch in delicate or emotion-laden situations and can over time decrease the personal touch clients cherish."

In spite of these advantages, the use of AI in P&C insurance industry also leads to a number of challenges: One of the areas of concern is that of the morality and legality of the use of personal information. Folches (2021, p. 98) states that "AI systems, particularly where they are used by the insurance sector, must be based on the manipulation of huge amounts of personal data which makes

privacy and data protection a concern." Also, the issue of algorithmic bias would have to be solved. Businesses and individuals need to be careful as Folches (2021, p. 101) notes, "AI systems risk discriminating certain groups, even with good intentions in mind." None of these can be eliminated, but in order to address them, insurers must discover solutions to ensure AI is guided by the dictates of the law and ethics. Lisnawati et al. (2016, p. 45) states agree, "Open AI standards and the mandatory enforcement of regulations will be necessary to maintain consumer trust in the insurance industry, particularly in an industry that requires long relationships for success.

2.4.2 Technological Advancements in AI for P&C Insurance

With the arrival of AI in the P&C insurance industry, the possibilities and the challenges are of an enormous size that essentially re-invent the industry. Technologies like ML, NLP, predictive analytics, and robotic process automation (RPA) have been used to increase efficiency and cut costs, optimize customer experience and serve as a control over risk. Joshi (2025, p. 67) states, "AI technologies have streamlined core insurance operations, enabling insurers to provide more customized services and lowering operational costs and enhancing efficiency."

One of the largest opportunities around AI is to make core insurance processes/increased efficiency more effective and economic. ML and robotic process automation are just a few of the many types of AI applications to automate difficult and time-consuming tasks like underwriting and claims processing, as well as customer support. Claims processing time is reduced, risk analysis options are more effective, there is less human error, which results in lower operational costs and improved scalability of insurers. As Joshi (2025, p. 71) states: "Automation of ordinary processes allows insurers to concentrate human resources on special assignments, which in turn improves the performance of costs and operational efficiency.

Another strategic opportunity is the enhancement of customer experience. AI technologies, specifically, NLP and chatbots help insurers provide 24/7 services and real-time answers to customer questions. Benpresse (2021, p. 45) states, "AI technologies, such as NLP and chatbots, have empowered insurers to offer 24/7 customer service, making it possible to increase customer satisfaction and improve service delivery efficiency." AI Applications: Its use is to assist customers

in tasks like quoting, claim submission, and management of policies, making it more convenient and satisfying. Also, the capabilities of AI in analyzing large volumes of data enable insurance providers to provide more personalized products and services based on each customer's preferences and behaviors (Empress, 2021, p. 48).

With the introduction of AI, the risk calculation and pricing have also improved. By creating predictive analytics and ML algorithms that use a number of data points, including past claims, environmental data, and real-time inputs from IoT technologies, insurers can more accurately determine risk. While Kondeti (2025, p. 142) asserts, "Artificial intelligence driven algorithms can aid insurers in pricing premiums more precisely based on a broader set of predictors such as real-time data, ensuring more customized pricing and competitive premiums." This has made it possible for insurers to identify risks before they occur and adjust their pricing policies accordingly.

Another possibility is the increased speed in which claims can be resolved as a result of AI. Insurers can use computer vision and image recognition technologies to assess the damage to property based on photos or videos sent by policyholders. This results in bypassing of the necessity of physical inspections, saving both time and costs. As Gundla (2025, p. 115) points out, "AI-powered computer vision systems have made significant inroads in cutting costs and time since automating damage analysis and eliminating the need for an in-person inspection." In addition, AI's fraud detection capabilities have made it faster, more precise for detecting fraudulent claims. this will help save a loss for the insurers (Aragani, 2024, p. 78).

Although the opportunity of leveraging AI holds a lot of possibilities, there are challenges associated with risk and control, especially in the spheres of data privacy and security. AI systems work with large amounts of personal and sensitive data and bring up the question of customer privacy. As Mbah (2024, p. 89) states, "Data privacy issues are especially prevalent in AI deployments, especially among industries such as insurance, where there are often significant amounts of sensitive personal details at stake." Insurers have to comply with strict data privacy rules such as GDPR and invest in solid security devices to help fight against data breaches.

Balancing the need to use data to power AI algorithms while preserving the privacy of the consumers that use those algorithms is a challenge for the industry.

Another of these issues is algorithmic bias. AI systems are trained using large datasets and if the datasets are biased then the AI models can deliver discriminatory results. Mbah (2024, p. 92) as experiments might show, AI systems are prone to display discriminatory effects in their outcomes, that is, "can unfortunately be made to exclude certain groups, to apply specific premium prices, etc. (based on real or imagined) disproportionately or unfairly". This poses an ethical and regulatory risk for insurers. To help overcome omissions such as these, it is important to train AI systems on diverse and representative data, and periodically audit systems for their fairness (Mbah, 2024, p. 93).

A big threat to the P&C insurance sector is uncertainty around AI regulations. The traditional processes of the insurance sector have been pushed to the brink by AI and its impact is far from negligible, which at the same time has been the regulator's struggle to keep up with technological development. Mbah (2024, p. 96) explains "The absence of explicit regulatory frameworks for the use of AI in insurance, especially in domains such as pricing and underwriting, represents a major risk for the insurance industry." Clear and consistent regulations will be necessary to ensure that AI is used responsibly and that insurers are not guilty of discriminating against customers.

Finally, combining AI and legacy insurance systems is a major challenge. The fact is, many P&C insurers are still using outdated infrastructure that makes it hard to scale the introduction of new AI technologies. Gundla (2025, p. 120) explains, "The process of transformation to AI-driven systems comes with a need for significant investment in infrastructure and training of employees, which can be met with resistance by employees who are unfamiliar with the technology." AI implementation needs to be done cautiously, to ensure that it augments the existing systems instead of replacing them because a sudden change might cause instability and demotivation in the workforce (Gundla, 2025, p. 123).

2.4.3 Challenges and Opportunities of AI Evolution

The emerging AI of the P&C insurance sector has brought with it both opportunities and challenges of a massive size that fundamentally reinvent the industry. Technologies like ML, NLP, predictive analytics & Robotic Process Automation (RPA) have helped in improving efficiency and cost reduction while enhancing customer experience and risk management. These innovations have simplified the major insurance processes and also have provided freedom for insurance companies to offer more individualized service, to become more efficient and to reduce or eliminate underwriting and claims inaccuracy.

One of AI's biggest opportunities is to increase the efficiency and cost effectiveness of core insurance processes. ML and robots process automation are examples of AI applications used to automate challenging and lengthy processes such as underwriting, claims processing and customer support. Claims processing is faster, the options for analyzing risk in these technologies are more effective, and there is less room for human error, leading to lower operational costs and better scalability for the insurer. Moreover, automation of some routine processes releases human resources for AI to engage in the more specialized tasks, which involves customer relationship and other planning activities, which in the long run improves overall competency and cost performance (Joshi, 2025).

The other important opportunity is on how to improve customer's experience. AI technologies, particularly NLP and chatbots empowered insurers to offer their customers with 24/7 services and real-time answers to their queries. Such applications of AI could assist customers in completing their daily tasks such as quote seeking, claims submission and policy control for their convenience and consumer satisfaction. In addition, AI can analyze vast amounts of data, which means that insurers can offer tailored products and services based on individual preferences and behavior. Engaging the specific needs of their customers will help insurers to gain better relationships with the clientele and also increase their long term loyalty (Benpresse, 2021).

Both proper risk calculation and pricing therefore has given an impetus to increase sheer volumes with the addition of AI, too. By developing predictive analytics and ML algorithms that

factored in various data points such as past claims, the surrounding environment, and real-time attackers of IoT technologies, insurers can more accurately determine risk. This will enable the insurers to get more customized price and find any risks in advance. The effectiveness of AI in dealing with large data has introduced more positive aspects to the underwriting activities, reduces the incidence of mistake and evolves to more precise fee that provided more precise data for more accurate and competitive premium to benefit both the insurance company and the consumers as a whole due to more fair and befitting is guaranteed on super competitor.

Another opportunity is the greater speed with which claims can be to resolved as a result of AI. Through the computer vision and image recognition technologies, insurers will be able to estimate the extent of damage in the property since by the use of the photos or video evidence being provided to them by the policyholders. This bypasses the need for physical inspection in most instances thus saving time as well as expenditures dealing with claims handling. The fraud detection capability has also increased the claim processing speed, and AI has filled in any gaps in the process of submitting a claim and is able to mark potential claims for fraud more accurately. This helps the insurance companies to minimize the loss and make them conduct their fair packages which suits them for claiming fair packages to the eligible claimers (Aragani, 2024).

Although leveraging AI comes with many opportunities, from a risk and control perspective a number of challenges are bound to crop up as insurers place new AI technologies in operation. This is one of its issues - data privacy and security. It is inevitable to argue that the safety of the customer information is questionable, since the AI systems handle data in enormous quantities of personal and sensitive information for tactical reasons. In practice, given the very strict conditions for privacy of data (such as GDPR[7]) insurers would do well to ensure they comply with those regulations and have good security to protect against leakages or mishaps with client

[7] "The European Union General Data Protection Regulation or GDPR is the toughest privacy and security law in the world. Though it was drafted and passed by the European Union (EU), it imposes obligations on organizations anywhere, so long as they target or collect data related to people in the EU. The regulation was put into effect on May 25, 2018." https://gdpr.eu/what-is-gdpr/ retrieved June 28, 2025

data. It will become a challenge to balance the need for data to use AI algorithms and respect the consumer's right to privacy (Mbah, 2024).

Another hindrance is that of the algorithm bias. AI systems are trained on large datasets, and if they are biased systems, then the results provided by the AI models may lead to discriminatory results. For example, the use of biased information in the underwriting process can result in fair exclusion or disproportionate premium payments for a specified group of population members. This is a significant ethical and regulatory risk for the insurers. To mitigate such concerns and ensure ethical decision-making, it is important to make AI systems learn using a broad and a representative data, and routinely check the systems on fairness (Mbah, 2024).

Another major threat to the P&C sector is uncertainty of AI regulations on its path to adopting the technologies. The reinsurance sector has continued to be revolutionized by the power of AI, putting the traditional insurance processes at risk; yet regulators struggle to stay on top of the latest advancements in technology. Similarly, the role AI plays in insurance doesn't include clear guidelines on how to use it in different places, including the pricing of insurance, underwriting, and even claims.

There lawsuits against insurers threaten these manufacturers' potential for profit and economic growth in a competitive market because they did not implement new regulations or create discriminatory actions and inequities when using AI-based decision-making. To lessen them, it will require the formulation of clear and consistent regulations to prevent irresponsible AI use (Mbah, 2024).

And, on the last, using actual legacy insurance enterprises with AI technologies is quite hard. For starters, many P&C insurers utilize an outdated infrastructure and may find it difficult to implement new AI types. Transforming to the AI management by introducing the required abilities in computerization and the formation of training will be very costly, and this would be met by the opposition to AI management because of the lack of knowledge about succeeding to machines. Further, implementation of AI should also be approached carefully in order to ensure that it

augments rather than substitutes a system, as this could lead to company instability and the sense of demotivation and lack of value for workers (Gundla, 2025).

2.5 Disintermediation in the Insurance Industry

2.5.1 Transformation of Intermediary Roles

The concept of AI-disintermediation has significantly impacted the traditional role of the intermediaries (agents and brokers) in the P&C insurance industry. In past times these cravens have played a pivotal role in linking the two parties and to provide services which are personalized and involved in claims management and risk management as well as to provide policy-related advice to the clients. Nevertheless, with the advent of AI technologies, the majority of such procedures are simplified and the role of intermediaries in several insurance operations are minimized.

One of the most serious ramifications of AI-led disintermediation is the substitution of robots for humans in underwriting and claims handling. Utilizing AI technologies, particularly ML and NLP, P&C insurers have been able to automate their claims processes for risk ranking, pricing, and addressing without a middle man. In underwriting, AI systems may be able to process huge amounts of data, such as historic claims, environmental data and data from interconnected devices in real-time (ex: telematics) to evaluate risks in a more accurate and efficient way than conventional patterns. Consequently, the different insurers are in position to sell customized prices and covers to the clients without necessarily involving the agents/brokers (Kondeti, 2025). Likewise, in claims processing, it is possible for AI technology to be leveraged for evaluating claims, for authenticating claims, and for calculating payout sums in an automated fashion without the need for human claims reviewers and intermediaries (Aragani, 2024).

Direct-to-consumer model is other source of disintermediation occurring as a result of AI. Conventional agents and brokers are always been the prime medium through which any customer will reach insurance policy. Nevertheless, the advent of AI-powered systems has opened the option this time, for Insurers to directly provide Direct-to-consumers options for customers to neither just

buy the insurance but also receive quotes and even claim insurance directly from subtracted role of intermediary. InsurTech companies have been capitalizing on this shift to develop applications that use AI to streamline the buying experience and offer fast-speed quotations, while also providing targeted recommendations based on a customer's unique data (Joshi, 2025). This change has seen agent and brokers having lesser roles in the sales process, especially where the products to be sold are simple and standardized and there is no need for customer counseling.

In addition, AI has also allowed for self-service customer models. AI-powered chatbots and virtual assistants have been integrated into the online capabilities of many insurance companies. These AI applications handle more menial activities of customer support comprising the customer's response, policy enquiries and claims. Computerization of such interactions minimize the need of man especially in dealing with generic queries as Benetzade (2021) elucidates that AI chat-bots service 24 hours a day and hence provide instant feedback and also guarantees the clients can retrieve information quickly. This change has entailed decreased involvement of intermediaries in the day-to-day running of policies and customer relations especially by jobs of lesser complexity.

Information related to the advisory and risk management duties, which is performed by the broker and the agents, are also affected by AI. In the past intermediaries have provided professional services to clients relating to the selection of appropriate policies in order to merge their risks. In AI, for instance, insurers have the chance to offer more intricate applications which would leverage customer behavior, exposure to risk, and past claims to report tailored products and cover plans. Such AI-driven services are coded to access and analyzed different aspects relating to a customer and provide real-time policy suggestions based on their demands without possessing a human agent to execute such policies (Patil et al, 2024). AI-based suggestions don't have to be based on historical data, therefore these recommendations are able to better demonstrate real-time information and were therefore able to offer customers more correct and dynamic suggestions as compared to a broker who won't have access to the information's history free variables.

Subsequent, there are simple, low risk and standardized policies which involve less individuality (usually with automatized recommendations) leading to less reliance on intermediaries.

Nevertheless, to be fair, despite all these innovations, a human mediator cannot be completely eliminated with the advent of AI driven disintermediation. While AI has stripped 'a lot of the people out of appraising' and underwriting housing, the claims handling and relationships with the customer, complex underwritings and one with a high net worth still require the knowledge and level of personal attention that only brokers and agents deliver. For example, in relation to high value commercial property or high value specialist insurance products, customers may continue to rely on a broker to analyzed their special requirements and to guide the process of obtaining insurance quotes. Brokers and agents bring about some sort of emotional intelligence to the party, connections in negotiations and knowledge of their industry that AI systems are yet to match. According to Benze (2021), it is true that the AI might be more efficient in analyzing data and automating work for the company, but it cannot know how to be high touches customer near and emphatic which are still needed with having certain stands of customers.

In addition, there are still some aspects with the regulating human factors still needed. Most insurance policies are complex and region specific and requires the abilities and knowledge of human intermediaries to follow the rules. Agents and brokers also carry on with their role of informing customers in terms of policy features, features, exclusions, as well as law. Although the AI has the advantage of being able to handle much of the compliance component of such work, it lacks both the ability to view and cut across the regulatory infrastructures and complexities that a human professional might notice, thus limiting the options for disintermediation in areas where compliance is of high concern.

2.5.2 AI and Insurance Distribution Models

By automating most of the insurer's operations and creating direct-to-consumer channels, AIs technologies have enabled insurers to avoid traditional middlemen such as agents and brokers. Traditionally, insurers held the center of the value chain in insurance through intermediary activity: to purchase policies around risk assessment, claims and clients overall (a recommendation for the

optimal cover). However, with the advent of AI, such perceptions have been trusted in terms of the fact that automation and mechanization of the entire process, that human middlemen also can play below the minimum attenuation in many imagery points of the end-to-end insurance transactions.

It is also only through automation that AI can help underwriters and other professionals assess risks, which is another critical mechanism for disintermediation. ML and predictive analytics have a capability to learn from large amounts of data such as customer behavior, previous claims, environmental conditions, etc., without human intervention and in a fraction of the time it would otherwise take human agents to analyze all of that. Dealing with the parent company and all their data directly allows for the physical pricing of risk and enables the insurers to unravel and price risk without the need for the broker to collate and analyze this data. Similarly, if a decision model relies on real-time information - and it is proposed that using AI could provide a dynamically evolving and personalized price - which therefore far required the use of intermediaries, this finding could deliver results (Gundla, 2025). Using AI-based customer engagement systems (or customer experience systems), underwriters will be able to price based on individual's choices and behaviors, such as driving patterns, installation of home security and so on, creating a more targeted competitive offering to customers by more accurately pricing the individual.

On an important note, the technological innovation that has occurred during pandemic involves direct-to-consumers platforms functioning through the alternative of AI, to help in bypassing the middlemen. With the integration of AI technology, insurers can create a web presence where clients can purchase policy, get quotes, and make claims without any form of involvement with a personal representative (agent) or an advisor. These involve AI enhanced platforms that make recommendations for policy advice and Real-Time Dynamic Pricing based on data analytics. In terms of technologies, Joshi (2025) outlines that InsurTech companies have leveraged AI to disrupt the traditional distribution models while attempting to introduce low-cost and efficient alternatives to standard broker-initiated district model sales. The customer does not

have to reveal everything involved in setting up and applying to a company where it sends products and with unique products tailored to each client's needs, the whole process of the quote, online 'experts' are chosen and purchases are made and the company provides them with insurance.

The use of AI-based chatbots and virtual assistants for customers and customer interactions is another significant technological change that makes this change easier. Those tools can take care of many forms of a customer discussion, from the knowledge of simple questions to claims. Chatbot can learn or understand customer requirement and respond to their requirement in real-time using NLP and ML algorithms. Since human operators are regularly used to query, this reduces the need for their use and improves the speed at which information is available to customers. Benetz (2021) states particularly that these AI tools are of value to provide full-time service so that customers can get an immediate answer to their questions about policies or claims and serve as another alternative to these middlemen in the customer services.

Claims management has then flowed a meaningful portion of AI in automating the process for managing claims. Traditionally, all claims were channelized through the mediation of brokers and agents who began the preparation of necessary paperwork and milled between insurers and customers. Some of this work has been digitized with AI and claims can be processed and rated by an insurer directly using some human interaction. Using AI, computer vision and text recognition techniques for damage estimates, by analyzing images or video sent by the customers, the extent of the loss can be quantified in several situations without further physical inspection (Aragani, 2024). This means, by implication, shorter turn round periods for claims receipt, and also low operating costs. Along with that, Fraud Detectors based on AI may identify suspicious claims patterns so that the brokers don't have to pre-verify claims manually, thus adding another dimension to the increased efficiency of claims management.

Despite all these developments, disintermediation resulting from AI does not completely neglect the role of intermediaries. While AI systems have good potential to standardize processes such as underwriting and claims assessment, there still remain a number of insurance products, especially in the commercial segment or the high-net-worth segment, that require the assistance of

brokers and agents. Brokers and agents also provide a sense of worthiness in the scenario where customers have needs for an expert recommendation, help towards spreading the risk of several complexities, or even an expert insurance (Bencep, 2021). With this example, brokers are still very much required to design commercial policies on a tailored basis for businesses with unique needs, or with complicated underwriting issues such as loss warranties. Even with AI, there will still be a need for intermediaries to manage the interface with clients and deliver services that require advisory input and may not be replicable by AI.

In addition to that, the regulatory framing challenge still exists for AI-driven models. When the AI process is made to handle the underwriting and other forms of claims processing, it brings with it the problem of fairness, transparency, and, in particular, accountability. As mentioned by Mbah (2024, p. 103), "The use of AI in underwriting and claims processing raises significant concerns about fairness, transparency, and accountability, especially in a highly regulated industry such as insurance." The biggest problem is around an insurance industry being heavily controlled by assertive controls. The role of intermediaries has long been associated with the concept of conformity toward rules, and this should be considered something that AI systems need to be programmed to work cooperatively with. Mbah (p.106) further explains, "AI systems must be designed to comply with existing regulatory frameworks, including ensuring that they are in line with regulations regarding data protection, anti-discrimination policies, and industry-specific regulations". In order to avoid the legal risks, the insurers must ensure that their systems are in line with the ever-evolving regulations and laws such as data protection laws and anti-discrimination policies, as well as the evolving nature of AI technology (Mbah, 2024, p. 108).

2.5.3 Risks and Benefits of Disintermediation

P&C Insurance Accelerating AI Automation: The next section, where we transition from Accelerating AI: Winter II is all about moving all the middlemen out of P&C insurance deals. While AI brightens the picture for organizations by promising economy, cost reduction and optimal customer service, it throws up some hurdles on the way which insurers would have to tackle in order to secure the best value, deliver optimal returns, and lessen the impact of the worst.

As explained by Gundla (2025, p. 145), "AI technologies, such as ML, RPA, and NLP, are transforming the way insurers operate through automation, including underwriting, claim processing, and customer service and eliminates the need for traditional intermediaries, such as brokers and agents."

One of the benefits of AI Automation is increased creativity and cost. AI technologies could help insurers to conduct an efficient and effective underwriting and claims process, freeing up time and resources to build claims slates and having long term visibility of claims. As stated by Gundla (2025, p. 147) "Machine learning algorithms can analyze vast amounts of data - including customer behaviors, past claims and environmental data - in order to give more accurate risk evaluations and premium rates, increasing operational efficiency and reducing costs." By automating these processes, insurance companies can lower the cost of the work they have to do to operate which would ultimately mean lower premiums for consumers. This in turn leads to better accessibility to customers offering more competitive prices and faster processing time, leading to improved overall efficiency of the insurance experience.

Another important benefit is that it can help to improve the customer experience. AI solutions, such as chatbots and virtual assistants, can help insurers offer direct-to-consumer services, for example, enabling customers to contact them through online platforms to get quotes, make purchases, make claims and seek assistance without the need to intervene and help from an agent. As Patil et al. (2024, p. 78) note, "AI-driven solutions, such as chatbots and virtual assistants, have revolutionized the way insurance companies interact with their customers, making it possible to provide them with 24/7 access to insurance services, improving the convenience and customer satisfaction experience." This constant availability provides consumers a flexibility for completing their insurance business, 24/7. Additionally, AI-driven platforms have the ability to customize the recommendations by leveraging customer data and needs to customize their policies and coverage, providing a more customer-friendly experience. Patil et al. (2024, p 80) further states, "The use of AI for personalized services enables businesses to provide customers with coverage options and policies that better meet their needs and improve customer satisfaction and engagement."

Another benefit of AI is the ability to process claims required faster and make real-time decisions. For instance, by using AI-powered tools such as image recognition and NLP, it could assist them to quickly determine damages from photos or videos sent by the policyholders in a process known as claims management, and also making the process faster. This removes the fear of a physical inspection or manual audit they traditionally have presently with brokers or claims adjusters. Thus, the insurers are able to pay out claims in a much smaller window of time to increase the time in which they are able to pay out claims and in turn customer satisfaction (Aragani, 2024). In addition, AI's predictive capabilities can help insurers to predict and anticipate opportunities for loss and “bad risks” before they occur, resulting in a better risk management and more proactive customer service.

Despite all these benefits, there are also a series of risks that cutting out the involvement of intermediaries using AI will entail - and these are risks that insurers will need to manage carefully. One of the major dangers to be experienced is loss of personalized service. While AI is great in automating routine tasks and policy recommendations tailored to each unique customer, it doesn't have that human touch that customers are still looking for, especially in the case of complex or sensitive matters. In cases where customer needs detailed advice or help in coping with complex claims or more personal relationships with customer, lack of human intervention might stand in the way of customers. Customers can lose any connection with their insurers and trust can be a potential erosion, these values can be more prominent among customers who believe in building relationships based on empathy and expertise (Ben годах, n.d.).

Another risk of AI driven disintermediation is exclusion of the weaker or the less tech savvy consumers. While these AI-based solutions may be convenient for many customers, they may be less accessible to older customers or those who are uncomfortable with using digital applications. This digital divide may experience a number of demographics excluded from the benefits the automation capabilities of AI offer, limiting these groups from affordable and effective insurance. For some consumers, especially those with less experience in functioning in a digital

world, human intermediaries continue to play a significant role in providing the support/advise one needs in the buying process and in settlement claims made against insurance (Венчке, 2021).

The danger from algorithmic bias is another risk in the process of reducing the number of intermediaries through the use of AI. AI systems are trained on data from the past and there is a possibility that biases could be embedded within the system. If not checked, AI algorithms might lead to discriminatory outcomes, for example, discriminatory pricing or refusal of coverage to some groups. As cautioned by Mbah (2024, p. 115), AI systems "have the potential to perpetuate biases, which can result in discriminatory outcomes, such as unfair pricing or access to coverage." This can lead to potential regulatory and legal issues for insurers as well as a lack of consumer trust as customers may feel that they are being treated unfairly. Ethical considerations associated with transparency, accountability, and fairness in the decision-making processes of AI are also important to ensure that AI models do not perpetuate discrimination (Mbah, 2024, p. 118).

Beyond the technology issues there are regulatory and compliance issues in moving to an AI-powered model for insurance. As AI systems are being used to underwrite and review insurance claims, it is necessary for insurance companies to make sure their systems comply with regulatory framework relating to the operations of how insurance companies take on business. As Mbah points out on page 120, there is a need "for insurance companies to ensure that AI systems are not only compliant with the existing laws, but also that the ethical standards around ethical and fair pricing and data security are navigated." This includes: non-discrimination, privacy of customer data and just pricing. However, AI is growing at a much faster pace than regulation, making it quite probable that insurers are unsure about how to interact in changing laws. As new regulations are introduced, and the benefits of AI can be enjoyed, it is critical to monitor their evolution, and respond with agencies change if and when it becomes necessary. David Mbah (2024, p. 123) opines: "The adoption of AI is relatively fast and regulatory frameworks will need to expand to address new laws and ethical issues to ensure that insurers remain compliant."

2.6 AI Applications in P&C Insurance

2.6.1 AI Tools for Operational Efficiency

AI technologies are changing the P&C insurance industry rather dramatically - from optimizing operational efficiency to providing more streamlined services. From ML for underwriting, NLP for customer service, applications of AI are changing the way insurers do business with customers and manage risks. These technologies help to automate and optimize key aspects important insurance processes, such as: Reducing operational costs: these technologies can help to reduce the costs associated with running insurance processes, such as analyzing huge amounts of data, which could translate into automated processes and help detect fraud. The best AI use cases, which are already being implemented in the P&C insurance industry, are ML for underwriting applications, NLP for claims processing and customer interactions, Computer vision for damages assessments, Predictive analytics for fraud detection and chatbots and virtual assistants for customer service.

ML has been an important factor in underwriting and risk assessment. ML can help insurers to better assess the opportunities for loss and determine appropriate premiums in a faster and more accurate way. As (Gundla 2025, p. 134) explains, "Machine learning algorithms allow insurers to analyze large amounts of data, such as customer behavior, past claims, and external factors such as weather patterns, to make more accurate risk assessments and price premiums." The ML algorithms will take in a vast volume of data and make sense of each predictive variable down to a level of granularity that was previously unavailable in traditional underwriting processes. This will enable insurers to avoid being trapped into generalized assumptions and allow them to make decisions based on data and prices in an efficient way and at the same time consider risk management on an individualistic basis (Gundla, 2025, p. 136).

The underwriting process has also greatly reduced the number of human interventions, which can lead to automated underwriting of policies making the operations of the insurance companies highly streamlined and almost error-free and with faster processing times. As per Gundla (2025, p. 138), "The integration of ML in the underwriting process has reduced the human

intervention and enhance the speed and accuracy of issuing the policy, which leads to faster processing times and efficient operations."

Another important application of AI is NLP - which is an application that is used to reduce the burden of claims processing and customer interaction. NLP can help AI systems to understand and interpret human language, automating processes for reviewing claims documentation, customer inquiries, etc. For example, NLP systems can be used to examine written claim reports and other documents to extract essential information, leading to a more speedy claims approval process and less administrative cost. In customer service, AI-based chatbots coupled with NLP-powered virtual assistants have ability to take care mundane questions, help in claims with files, give information about policies and even recommend customized policies. According to :- Joshi, 2025 Company Also, these systems are known for improving the efficiency by providing 24X7 support services to customers, with less need for the customer support call centers and dealing agents for responding to simple queries from customers. This automation not only helps save us operation cost but helps in providing a better overall customer experience by providing accurate and quick responses.

Another AI technology gaining traction in the P&C insurance market and in damage assessment specifically is computer vision. Traditionally, in the case of property or vehicles in accidents, damage claims, disbursing claims, and assigning responsibility for damage was time consuming and expensive and required human claims adjusters to physically inspect the damages. AI-driven computer vision helps identify damages by insurance companies from the images and videos they receive from policy holders. Using AI to analyzed the photos taken of vehicles or property, it is possible to understand the extent of the damage and calculate repair costs while also enabling claims to be approved much faster than before. Aragani, 2024) mentions the usage of the capacity of AI to conduct visuals with a high degree of accuracy in order to expedite the claims and to save operational costs. This technology is particularly valuable in the property insurance domain where AI can be used for automatic appraisal of claims following natural disasters or other events further speeding up claims processing.

Insurance companies are also finding ways of how AI can be used to help them keep their operations efficient in predicting future claims, identifying possible fraudulent behavior, and understanding the risks for claims. Using massive amounts of historical data, AI algorithms can be used, for example, to predict which customers are more likely to file a claim, and what sorts of claims are likely to occur. As Kondeti (2025, p. 145) puts it, "AI algorithms use historical data to find the probability of claims, which helps insurers proactive in risk management and policy modifications before problems occur." This proactive approach to claims management gives the functional opportunity for the insurers to make changes to policies, provide discounts or take other action to mitigate risk before problems occur. In addition, AI-based predictive models are very efficient in exploring fraudulent claims by looking for patterns and anomalies in the claims data. Kondeti (2025, p. 148) explains, "The ability of predictive models in AI to identify anomalies in claims data (for example, suspicious transactions) enables insurers to highlight insurance claims that need to be investigated further." Fraud detection accuracy - fraudulent claims can be flagged, allowing human claim agents to investigate further and more accurate and efficient fraud detection is the result. The use of predictive analytics has huge implications as Kondeti (2025, p. 150) shows, "AI-driven fraud detection has the potential to minimize the costs of fraudulent claims, improving operational efficiency and profitability for insurers."

Last but not least, virtual assistants and chatbots powered by AI are making a game changer for customer service representatives (CSRs) for P&C insurance. These systems leverage the power of NLP and ML to provide 24/7 instant customer support to the policy holders. Customers can obtain information for queries, tailored policy recommendations and claims with the help of AI-powered interfaces without even having to talk to an agent. As Patil et al. (2024, p. 92) note, "AIs in chatbots and virtual assistance AI is poised to revolutionize customer service with its ability to efficiently manage common customer inquiries and provide personalized user interactions, all while providing immense levels of customer satisfaction." This has led to an enormous decrease in the number of calls that must be handled in the call center with agents on hand, which can be used to handle more complicated issues. The efficiency and availability of customer support using

AI enables a more seamless and convenient customer experience which can help in building brand loyalty and achieve better customer retention as a whole (Patil et al, 2024, p. 95).

2.6.2 AI's Role in Claims Processing and Cost Reduction

AI-based claims processing is shaking up the P&C insurance industry with its potential to fundamentally reduce cost and improve customer satisfaction. From estimation to fraud detection to customer service, claims management currently completes the tasks that are tedious, time-consuming, computerized as result of integrating AI into overall claims processing systems potentializes customer's overall claims journey. For that reason, the cost hierarchy for conducting business is diminished, the claims processing speed is especially increased and the customers are offered with a more reactive and personal service.

One of the major benefits that can be gotten from the usage of AI in claims processing is the automation of damage assessment and claims assessment. Traditionally, the method of measuring property or vehicle damages, for example, was through the use of human claims adjusters who meticulously reviewed the damages; a process that was inefficient and took time and money. AI systems with special strength in computer vision and image scanning can wait for online input from the customer, where the customer would upload a picture or video of the damaged vehicle, and the robot would be able to evaluate the damage and quickly provide a quotation for damage and repair. Not only does this technology reduce need for the physical inspection side of the operation but it also funnels their business through better workflow and easier claim processing resulting in faster pay-outs. By automating such assessments, the system eliminates the opportunity for human error and will result in a higher degree of consistency in damage assessment, cost reductions for operations and efficiency (Aragani 2024).

Another serious impact of AI is that it helps expedite claims resolutions due to the occurrences of directly upgrading customer contentment. With the power of AI for claims processing, claims can be analyzed, coverage verified & even settlements made in a fraction of the time it would take using the traditional claims processing process. By digitizing the entire process, insurers will be able to process claims instantly and eliminate waiting periods for the policyholders.

Improved Customer Satisfaction: Faster resolution of claims leads to higher customer satisfaction due to an efficient and timely process of claim resolution. According to GNDL (2025), experiential recommendations are just one example of the primary benefits of AI - it can help increase customer retention and loyalty while decreasing claims processing time from weeks to a matter of days.

The Role of AI in Fraud Detection is also relevant for cost reduction. Insurance companies in particular are plagued by claims fraud which leads to more favorable premiums for all who are using the insurance. AI - Predictive analytics and anomaly detection - AI technologies (e.g. predictive analytics and anomaly detection) help insurers to spot out suspicious claims based on patterns in claims data. Further, the AI models enable insurers to determine inconsistencies or patterns that are out of the norm and could be indicative of fraudulent behavior, helping them to spot a potentially fraudulent claim early in the claims process. Finding and investigating fraud efficiently can save insurers from spending lots of money on the manual investigation and loss of money due to fraudulent claims. Most importantly, this will help both in protecting the insurer's bottom line, as well as in protecting the affordability of insurance premiums for all parties.

Second, work efficiency: AI technologies help to increase the work efficiency by automating various repetitive administrative tasks. RPA can be employed to automate repetitive tasks, such as data entry, document processing, and routing claims, which frees up human staff to focus on more complex aspects of claims management. By automating these functions within the back office, insurers are able to reduce money spent on labor and optimize the claim processing speeds and accuracy of processing claims. This eliminates the need for manual processing, thus reducing the likelihood of error, resulting in fewer mistakes in the claims process, as reduced errors also lower the risk of costly mistakes leading to fines (or worse) from regulatory bodies (Aragani, 2024) or dissatisfied customers.

Furthermore, AI options for enhanced self-service by the customer through the assistance of any AI-enabled portals and mobile apps should certainly also be considered. Claim Attract: It enables insurance companies to allow insureds to submit claims via self-service portals, track claim status, and even upload claim documents or photos. They tend be round the clock allowing

the customer to control their claims schedule, rather than waiting for office hours, or if they are available they don't need to speak to a human agent. This self-service feature not only enhances customer satisfaction by improving control and flexibility to customers but also takes away from calls centers and customer service reps their role in answering client calls. As a result, insurers are able to process a higher number of claims without the need for additional employees and hence result in a lower cost operation (Patil, et al. 2024).

Last but not least, AI-powered Chatbots and Artificial Assistants are playing an important role in service to consumers and further streamline business processes. Chatbots can be utilized for automating customer inquiry, supporting process assistance for filing claims, providing information about their policies and also give live updates to the policyholder for claims. By automating these functions, insurance companies can decrease the number of calls and emails that must be processed by a human agent, saving money on the need for human agents and increasing efficiency. These AI-based systems can provide instant customer question answering services, adding velocity to service and filling in the gap for providing the right information to the customers at the right time - thus increasing customer satisfaction levels (Joshi, 2025).

2.7 The Role of AI in Customer Experience and Engagement

2.7.1 Enhancing Customer Experience with AI Tools

Chatbots, robo-advisor[8] technologies, and other AI-based customer engagement tools are having a significant impact on the customer experience for P&C insurance by delivering faster, personalized and efficient service. As Patil et al. (2024, p. 80) note, "Even using AI technologies like chatbots and robo-advisors, insurers will be able to automate routine interactions with customers, answer questions in real-time, and offer personalized advice, drastically improving the customer experience." These AI technologies allow insurers to automate standard customer interactions, answer customer questions in real-time and offer tailored advice, which significantly

[8] A robo-advisor is an automated advisor that provides algorithm-driven management services with little to no human intervention.

improves the customer journey. Besides, chatbots and robo-advisors will also deliver a more streamlined easier experience to policyholders for insurance services: faster, more reliable, and less expensive.

One of the key benefits of application tools powered by AI is that they are available at any time of the day and are able to provide continuous support. Chatbots are never unavailable, unlike human agents, so customers can get help day or night. As Patil et al. (2024, p. 82) explain that: "AI-powered chatbots are available 24/7, giving policyholders support whenever they need it, especially in cases of emergency or outside of regular business hours." This is particularly helpful in the insurance sector where policyholders may need assistance outside of standard business hours, for example, in an emergency, where they are making a claim or have questions about their policy. AI-powered chatbots have been found to do everything from answer simple policy questions to give quotes and even process claims - and they can do so without the human's help. "Immediate and consistent responses in the interaction not only significantly determine the customer's satisfaction, but also affect his expectations by eliminating the customer's waiting time with the company, which will contribute to the customer experience (Patil et al., 2024, p. 85).

Furthermore, the reduced response times and waiting times define the AI-powered customer engagement platforms. These tools allow for the proactive resolution of customer inquiries because they provide real-time responses to inquiries about policies, coverage options, and claims. AIOps has a much faster speed compared to traditional human agents, which can become bottlenecks during high traffic periods and have high latency. As Benuce (2021, p. 122) states, "AI tools such as AIOps considerably lower weights and increase response efficiency that directly contributes to customer satisfaction and loyalty." Reduction in wait times: This is a crucial factor in enhancing customer satisfaction since policyholders like the fact that they do not need to wait for a long time. Higher level of resolution of issues such as claim or coverage questions, leading to higher customer loyalty due to higher convenience and transparency with proper process resolution.

AI technology such as robo-advisors is also critical to the humanization of the interaction and personalizing on policy. These AI systems learn from their customers' behavior patterns and preferences and their history with the system to offer more relevant recommendations. As Joshi (2025, p. 72) states: "Robo-advisors take customer data and give more targeted coverage advice based on risk profiles, lifestyle and specific needs, which can result in better customer experience and higher retention." This personalization makes the experience more customer-centric, making customers feel that their needs are being addressed. Improved customer experience - The customer experience is improved, and the likelihood of the policyholder retaining the product and service of the insurers is high since the customers tend to stay with those insurers whose solutions are more favorable for their specific needs (Joshi, 2025, p. 75).

Another important aspect in which AI-powered tools help improve the customer experience is the claims process. Unfortunately, the traditional way of claims processing is expensive and time-consuming. AI-driven technology can automate and speed up the whole claims process where the handling of claims pieces doesn't require the intervention of human agents. As Kondeti (2025, p.156) points out, "AI-enabled claims systems are capable of automating the validation, verification, and estimation processes, saving a lot of time in the claims processing workflow and improving overall service levels." From immediate claim validation to claims checking and estimating payouts based on documentation analyzed using AI like photos or video, AI systems can help expedite the process. This leads to a significant reduction in time and can help the insurer to close the claims with superior levels of service and customer experience. The automation of processes can help reduce the number of days it takes to resolve claims, as well as provide value to claims teams by reducing their cost in human resources and human errors.

AI-powered self-service channels provide customers with control over their policies, changes, and claim management options and enable them to take control of these processes. As Kondeti (2025, p. 158) explains, "AI-based self-service portals enable customers to self-register their policies, update their profiles, and make claims, which provides more convenience and transparency." This self-service capability represents a tremendous change for improved customer

experience because it enables customers to proactively take control of their insurance needs without having to wait on the phone for human beings to respond. For instance, customers can view their policy details, update their details and raise claims anytime and anywhere through AI-based portals or mobile apps. Easy Access: All of this is transparent and easy access for the insurance process. Moreover, it enables the insurance providers to be more efficient by servicing more customers without necessarily increasing the number of their employees significantly, thus optimizing the efficiency of the insurance providers and lowering their operational costs (Kondeti, 2025, p. 160).

Third, AI technologies make projections steady and accurate. Unlike human agents who are prone to information inconsistency, AI-based tools offer consistency and reliability of service. As Kondeti (2025, p. 163) explains, "Since AI systems are capable of providing consistent, accurate, and timely information, customers can rest assured that they will receive reliable assistance each time they interact with the system." Whether it's reacting to a claim enquiry, explaining policy terms or answering common questions, AI-powered systems emit precise information with all the most up-to-date data. This consistency helps to build trust among customers and other stakeholders because policyholders can rely on AI tools for accurate and timely support. Not only that contributes to the more reliable service, but the chances of mistakes possible are minimized that may lead to the frustration and loss of the customer (Kondeti, 2025, p. 165).

2.7.2 Customer Perception of AI vs. Human Service

Customer's perceptions on AI-based customer service vs. traditional human mediated service for P&C insurance vary particularly when it comes to trust and satisfaction. While there have been associated benefits in efficiency, speed and availability with the use of AI tools like chatbots and robo-advisors, they still lack the ability to replace human personal touch and empathy offered by human agents. These differences generate huge differences to the customer's satisfaction and trust (two important factors in the insurance industry).

Trust is an important component to being able to have customer relations with insurance companies which, considering insurance being a complex and often personal product, it's certainly an important element of being able to do this. Traditional human mediated services tend to do a better job building trust due to, amongst other things: Ability for human agent to show emotional intelligence, empathy and personalized care. Human agents can reassure customers, convey the nuts and bolts of policies, and give more esoteric advice than that I think is currently achievable with AI. Customers tend to be more comfortable in talking to humans for solving complex or touchy issue because human have better enabling capability for customer in understanding and solving various customer problems and searching for tailormade solutions. In comparison, systems that are based on AI technology, while effective, can be impersonal or robotic - such as trust may be difficult because in certain instances lofty claims are made, or personal sensitive information is disclosed. According to (Bențe, 2021), while AI can simulate a friendly tone, it cannot match the emotional intelligence of a human connection so we may face customers distrust towards it in a potential deal with big stakes like claim processing.

That is said if time passes and you learn more about and are exposed to AI, trust can actually go up. As customers attempt a reliable and consistent performance with AI tools, for example receiving speedy and accurate response to routine queries, this may see the customers start to trust these systems to perform simpler interactions. AI can be trusted for certain tasks such as getting quotes, claims, and personal information updates when customers have been won over by the accuracy and speed of the AI system. Patil et al. (2024) proposed that if customers have the option to engage with AI tooling concerning their need, and if such engagement leads to effective fulfillment of customer needs, the trust in such technology, and particularly system transparency and accuracy, is established.

In terms of customer satisfaction, its ability to provide fast and available customer service is that which AI-driven customer service is appreciated for. AI tools, including chatbots and robo-advisors, can provide instantaneous responses, which is a huge difference from traditional human-mediated service during which a customer may have to wait for an agent to be free. Accessibility

and flexibility: 24/7 accessibility of AI tools also aids in increasing customer satisfaction 'especially' for customers who need assistance outside of office hours. These robotic tools can have the processing capacity to answer simple inquiries and instantly help anyone out by providing quotes, answers to policy questions or even processing claims. Customers in turn appreciate this convenience, as they can take care of their insurance needs without having to wait around for business hours to speak to humans, and without having to wait for humans to respond. This improved accessibility and responsiveness leads to higher levels of customer satisfaction as a whole (Patil et al., 2024).

However, while AI improves customer satisfaction in doing simple and straight-forward tasks, then traditional human service is appreciable when a customer needs personalized service from the company. In the case where there is greater complexity (when arguing over claims, for example), detailed knowledge about complicated policies or personalized financial advice, customers generally like to be human. Human agents can offer empathy, compassion, and personalization based on each customer's details. This human contact is especially important in the insurance sector where the customer may feel vulnerable or confused about their policy coverage or claims. While (Joshi, 2025) asserts AI has made a better life for an individual since it might render services that might help most people to get it faster, there are being claims from certain consumers that AI does have a few areas where human touch is advisable because there are some situations where dealing with a lot of policy might make a difference.

Another field that human mediated service currently seems to be performing better than AI is personalization (mainly calibration on complex needs). AI has come a long way in terms of personalized recommendations based on data analytics, but even then, the human agents are still better at personalized interactions. Robo-advisors: They make recommendations based on the data they collect on the customer, but they can analyze data for only pattern recognition and fail to replicate the level of understanding of their owners. For instance, a robo-advisor can suggest insurance products based on the data it has but cannot account for any significant personal variables (emotional play, personal situations of the customer etc.) that can only be done by a

human advisor. In addition to that, as per (Kondeti, 2025), human agents can empathize with customers, making an emotional connection that is difficult for AI to accomplish.

However, as AI-based tools keep developing their ability to deliver personalized experiences continues to improve due to their integration with other powerful analytics tools such as data analytics and ML. However, the AI system is learning and bound to become more and more sophisticated, and it is safe to assume that their capacity of providing personalized responses and recommendations based on patterns of individual preferences will increase accordingly so that it can deliver a more human like response. Yet - so far - the more human elements of service, such as human-mediated service, are still better suited to provide the kind of nuanced, empathetic care so many customers still seek at a more complicated level.

2.8 Literature Gaps

1. Impact of AI on Complex Insurance Products

While there is existing research on the impact of AI on basic and commoditized insurance products, there is little discussion on how AI can be applied to complex or customized insurance products, especially pure commercial products in the net worth segment or specialized areas. A number of such insurance policies necessitate specialized advice, risk adjustment and personal interaction, which are major domains of traditional intermediaries. Future research is required to understand whether specific AI is well capable of either fully or partly automating underwriting, risk assessment and claims handling processes in these complex insurance sectors and if so, how AI can replace or complement the activities of intermediaries.

2. Long-Term Effects of AI on Customer Trust and Emotional Intelligence

While we know of AI applications such as chatbots and robo-advisors that can improve efficiency and convenience, there is a large gap in terms of understanding the impact of these technologies on customer trust on the long-term. This is especially important in the insurance industry where relationships are often built on emotional intelligence and a personalized experience. While the existing literature addresses primarily short-term customer satisfaction in

the utilization of AI-based tools, a more in-depth understanding of the development of trust throughout a customer-AI interaction is required, especially in claims of high complexity and/or high stake insurance applications.

3. Ethical and Regulatory Challenges of AI in P&C Insurance

While efficiencies provided by the use of AI technologies exist, ethical and regulatory issues surrounding AI in the P&C insurance industry have yet to be fully explored. This is because of the lack of transparency in AI decision-making systems, the potential for bias and discrimination, data privacy concerns, and the importance of having a robust regulatory framework in place. The current regulatory frameworks lack capacity to mitigate or address ethical dilemmas and the legal uncertainties that AI implementation raises. Research is needed to examine how regulations currently do not keep up with the pace of AI innovation and what are the necessary regulatory changes to ensure fairness, accountability, and transparency for AI-oriented processes, especially in critical areas such as underwriting and claims management.

4. Adoption of AI in Emerging Insurance Markets

While emerging markets have adopted and will continue to adopt AI in insurance, due to the volume of AI adoption studies from the established insurance hub countries, U.S, EU and sections of Asia, there is unevenness in the adoption research related to AI and emerging insurance markets. These regions may face some unique challenges due to differences in the technological infrastructure, regulatory environment and consumer behavior. Another area that could be further researched would be to explore the ways of adoption of AI by InsurTech entrants and incumbents in the context of emerging economies and how such adoption impacts the disintermediation process, as well as the adoption journey, in emerging markets. Uncovering some of these dynamics would be insightful for how AI might be expected to be put into practice in developing economies.

2.9 Summary

The literature review is critical examination of transformative role played by AI technology within the P&C insurance industry with a special focus in process of disintermediation. Over the

years the P&C insurance industry has been wildly dependent upon intermediaries such as brokers, agents and adjusters in conducting transactions between insurers and policyholders. These intermediaries have played important roles in the different stages of the insurance process such as risk assessment, underwriting of policies, handling claims and customer service. However, the advent of AI technologies has meant the fundamental change in this traditional model, which reduces or eliminates the need for intermediaries between humans and the insurance process in a lot of insurance functions.

The review looks at various important AI technologies such as ML, predictive analytics and NLP technologies being used to automate critical operations within the P&C insurance world. AI's ability to power operational efficiency, underwrite accuracy, faster claims processing and personalization of a customer experience have been focal themes in literature. AI-based systems allow insurers to do what intermediaries have traditionally done such as analyzing the risk, setting prices and adjudicating claims, more quickly, accurately and at a lower cost.

The chapter also deals with the theoretical frameworks underlying the impact of AI on the P&C insurance industry. Disintermediation Theory is applied to understand the decrease in the number of intermediaries in the industry, while the Technology Acceptance Model (TAM) is used to understand the factors that affect the acceptance of AI technologies by insurers and policyholders, respectively. Additionally, Innovation Diffusion Theory (IDT) offers some insight into the pace at which AI is being adopted throughout the industry - and what factors will speed up or slow down, or cause AI to become part of mainstream practices.

Despite the clear benefits of AI, according to the review there are a few challenges and concerns about the adoption of AI in the P&C insurance industry. Ethical issues like algorithmic bias, data privacy and transparency in decision-making are important hurdles that have to be overcome in order to ensure the responsible and fair usage of AI technologies. Additionally, the regulatory environment finds it difficult to keep up with AI developments, so it is still not clear how the laws will be applied for AI-driven processes in insurance. The literature has also suggested that despite the potential for AI to make operations more efficient, due to its inability to act in an

emotional manner and simultaneously provide personalized treatment for customers, customer trust and satisfaction may be impacted, especially in more complicated insurance circumstances.

Finally, the review identifies several areas of literature that require further study. These are the implications of AI in complex insurance products, what AI can mean for customer trust and in the long term, and finally the ethical and regulatory challenges of adopting AI in the insurance sector. Furthermore, there is need to dig into AI adoption in emerging market, which the regulatory and technological infrastructure may be significantly different than the mature market.

CHAPTER III:

RESEARCH METHODOLOGY

3.1. Introduction

The main purpose of this chapter is to introduce the research methodology used in this dissertation in analyzing the transformative role of Artificial Intelligence (AI) in the Commercial Property and Casualty (P&C) insurance industry based on the concept of transformative technologies, especially, AI driven disintermediation. In doing so, this study aims to identify the degree to which AI technologies are altering the classical roles of intermediaries, such as brokers, agents, adjusters, etc. in the insurance industry. In addition, it examines the wider operational, customer service, regulatory and ethical aspects of these technological enhancements.

Therefore, in order to achieve an effective mission of the research questions (RQs) in this study, then this research in its implementation includes a mixed methodology, that is a combination of a quantitative and qualitative data collection and analysis process. The quantitative component relies on a survey which gathers numerical information from the industry practitioners while the qualitative component involves a content analysis from secondary sources such as academic literature, corporate reports or industry studies. This bi-pronged approach is also referred to as triangulation - triangulating helps to more finely grain the impact of AI in the P&C insurance industry by solidifying results from a variety of angles.

The structure of this chapter is as follows: First, the research design and methods used are outlined which shows the rationale applied in selecting a survey and content analysis. Next, the population and sampling methods are explained and the selection process used to recruit participants for the study is described. After that, an explanation is given on the methods used to collect data (for both the survey and the content analysis) by explaining the tools used, procedures used to process data and the analysis techniques used. And finally, the last chapter provides an overview of ethical aspects of the research and limitations.

The methodology seeks to deliver the reliability and validity of the insights resulting in a nuanced understanding of how AI is on its way to transforming the P&C Insurance industry on an operational and interconnection with traditional intermediaries, customers and regulatory frameworks.

3.2 Research Methods and Design

This research is based on an explanatory sequential mixed-methods design, which consists of two parts: quantitative survey and qualitative content analysis. In order to increase the validity of the study, this design builds on triangulation of data thereby combining the statistical information that can be gained from the survey with the depth of information available through content analysis. The two methods are complementary in the way that the quantitative survey obtains a broad spectrum of opinions from industry participants whereas the qualitative content analysis generates a deeper understanding of the available data from secondary sources.

The quantitative part of the research was conducted through a survey which aimed to collect a wide range of responses from professionals from industry in a range of role types in the P&C insurance industry. A total of 196 respondents, shared their perspective on enhancing the role of AI in operations, evolving intermediaries, customers' perception of AI-powered services, and regulatory and ethical considerations. The survey used 5-point Likert scale response options for respondents to indicate the degree of agreement to a number of statements and generate quantitative data that can be statistically analyzed to reveal patterns, correlations, and trends. Statistical measures such as regression analysis, analysis of variances (ANV) and factor analysis were applied to the survey results so as to conduct a systematic analysis on the impacts of AI on the P&C insurance industry.

The qualitative part of the research will be content analysis of secondary data sources, which is used as a benchmark and to build on survey findings. This part of the research addresses RQ2, RQ3 and RQ4 by carrying out a systematic content analysis of academic, corporate and regulatory documents, industry research, and consumer artefacts on AI in the P&C insurance

sector. The content analysis corpus includes peer-reviewed journal articles on AI in underwriting, claims processing, and customer services, corporate filings from insurers, and regulatory guidance (e.g. NAIC, EIOPA and GDPR), industry research reports (e.g. Deloitte, McKinsey and Accenture), policy booklets, FAQs and chat transcripts. Interests of the content analysis are between January 2018 and October 2025, which reflects the current period of AI adoption in the modern age.

The content analysis will be undertaken through a hybrid coding methodology (i.e., deductive and inductive methods are used). The deductive approach will be based on the application of established theories and frameworks (e.g., Technology Acceptance Model or Disintermediation Theory) to inform the coding process and the inductive approach will ensure that emergent themes are derived from the data itself. The main coding software for the content analysis will be NVivo or Atlas.ti and other methods used will include Excel for creating frequency counts and co-occurrence tables to establish significant patterns. The thematic codes will give an insight into the main regulatory, ethical and operational issues relating to AI within the insurance industry that will be contrasted with the outcomes from surveying.

Five different source types will be used for sampling (academic literature, corporate reports, regulatory guidelines, industry research and consumer artifacts). stratified purposive sampling. The goal is to collect 220-300 documents (roughly 80 academic, 60 corporate, 40 regulatory, 30 industries, and 20 consumer), therein there should be diversity of opinion and sources in the analysis. The set of documents will be based on stringent inclusion criteria (for example, being in English language, in P&C insurance context, explicitly mentioning AI or ML automation in relevant areas (e.g. underwriting, claims, customer service, intermediaries, regulatory/privacy concerns, etc.)). Exceptions to this rule will be: Life/Life insurance underwriting documentation (Unless cross referenced) Marketing Material Copies.

By combining both the quantitative survey information with the qualitative content analysis this research design will help to ensure the research is providing a complete and well-rounded analysis of the impact of AI within the P&C insurance industry. This triangulation of results

between these two instruments will make the overall results more credible while making a subtler interpretation of the underlying transformations of the industry by AI possible.

3.3 Population and Sample

3.3.1 Organizational Population and Sample

The target of this research is the organizations in the P&C insurance industry and this research has investigated 132 organizations. This includes both the traditional insurance companies as well as Insurtech companies. Traditional insurance players are the established players in the industry and most of them are gradually integrating AI in their business operation. On the other hand, the Insurtech companies are new firms and they are generally more pioneers in the adoption of some advanced technologies, including AI. Therefore, we use both types of organizations to contrast the adoption process and use of AI in different business models and technological preparation levels.

The sample of organizations will be drawn from the population in order to achieve variety in terms of company size, maturity level of use of AI and industry function. The sample will include organizations from conventional insurance companies, as well as new generation Insurtech companies. This is an element that allows the study to quantify the comparatively different weight that AI will exert on traditional insurance systems compared to technological disruptions in the Insurtech sector. The variety of different firm types must lead to some very interesting findings between companies who are more traditional and are leading the way in technology adoption.

The final number of selected organizations is 132 which depend on factors such as availability of data, willingness of organizations to participate, and consideration of having a balanced mix of the two types of organizations. The sample size is adequate to allow meaningful comparison and generation of results which are generalized for the P&C insurance industry in general.

3.3.2 Internal Stakeholders- Population and Sample

The internal stakeholder's population for this study are the professionals directly involved in adoption and implementation of AI technologies in the P&C insurance industry. These stakeholders carry out important roles in changing the way industry operates, particularly in connection to such topics as underwriting, claims management, customer services and disintermediation of traditional roles. The population consists professionals in key positions including commercial insurance buyers, brokers, agents, claims adjusters, underwriters and professionals in Insurtech. These individuals are directly engaged with the AI technologies, and their insights are important for understanding how AI is reshaping the P&C insurance industry.

The sample for this study will be made up of 196 respondents using the technique of random sampling. This way, everyone included in the population has an equal chance of being included, thus eliminating the risk of being biased and of having a representative sample of the larger industry. The random sampling approach will enable a diverse range of opinion to be captured with participants hailing from a variety of professional backgrounds of a variety of organizations.

The selection of these 196 professionals will be based on their involvement in activity of organizations that are actively involved with adoption of AI. This way, there is a guarantee that the sample is made up of people with a wide range of experiences and familiarity with AI technologies. The goal is to obtain a diverse number of voices from professionals from various stages of the integration process by using AI, from those that have much experience in this process to those who are starting to use these technologies. This diversity will provide a complete picture of how AI is affecting the Insurance industry from the perspective of people working on the front lines of AI implementation.

By implementing random sampling, it aims to collect a wide-ranging and representative sample of opinions with the intention of reducing any chance of biased results. The random selection method also helps guarantee that the conclusions of the study are more universally feasible in the industry overall, not just the opinion of any specific group or subset of professionals.

3.4 Data Collection, Processing, and Analysis

3.4.1 Data Collection

This study consists of two main instruments for data collection as a survey to obtain quantitative data and content analysis for obtaining a qualitative data. These methods will be used in turn so that triangulation can be used to improve the validity and richness of the information.

The quantitative data of the survey will be conducted on the professionals of the P&C insurance industry. The survey will be aimed towards understanding impact of AI on operational efficiency, intermediary relationship, customer satisfaction and the regulatory. It will contain 32 questions which are broken into five major sections. The first portion will address the operational impact of AI, the impact of AI in underwriting, claims processing and customer service. The second part will cover the role traditional intermediaries play; brokers, agents, and adjusters, before discussing how AI has altered the role intermediaries play in the process. The third area will be the customer experience, and this will measure the perception of quality, trust, and customer satisfaction between AI-powered services and human-provided services. The fourth segment of the article will concentrate on the ethical and legal aspects of adopting AI, including data privacy and algorithm transparency. Finally, in the last part, attention will be more specifically related to the impact of the AI on the protection of personal data and their role in data privacy issues.

The scale of the survey will be developed using the 5-point Likert scale from 1 (strongly disagree) to 5 (strongly agree), in order to allow the respondents to provide different levels of agreement with the statements presented. This structured approach will enable the quantitative analysis of the data which will provide clear results concerning the respondent's perception of how AI has and continues to impact in the P&C insurance industry.

The survey will be sent online through the Google Forms, which is a highly available online tool allowing the respondents to complete the survey at their leisure. The responses will automatically be collected using this platform and be saved into Google Sheets for easy classification for further analytics. The survey will be open for two weeks and will give the survey takers enough time to respond.

In addition to the survey, the study will involve content analysis of secondary sources of data. These sources include academic papers, industry reports, corporate reports, regulatory documents, and documents targeted to consumers. The aim of the content analysis is to gather qualitative information regarding how the P&C insurance sector is embracing AI that will add value to the survey results. Documents to be selected for analysis will be selected from the period January 2018 to October 2025 to reflect the wave of current adoption trends of AI. Content will be chosen based on inclusion criteria related to the AI and ML applications in underwriting, claims, customer service, regulatory or privacy issues. Messages relating to life and health insurance, personal property and casualty insurance or simply marketing materials will be excluded.

The source documents for the content analysis will be selected by using the technique of stratified purposive sampling. This will include approximately 220 - 300 documents and will be divided relatively evenly among the following 5 areas: peer-reviewed academic articles (~80 documents), corporate reports (~60 documents), regulatory materials (~40 documents), industry research reports (~30 documents) and consumer artifacts (~20 documents). From the industry perspective, this variety of options will provide an all-encompassing view of how AI will be used in the P&C insurance industry from diverse points of view.

3.4.2 Data Processing

Once the survey data collection period is over the responses will be thoroughly reviewed for completeness and accuracy. Any incomplete or invalid responses will be removed in order to ensure the integrity of the dataset. The cleaned data would then be organized for statistical analysis. The responses to the Likert scale questions will be numerically coded, and each response will be assigned a score of either between one and five. For all questions involving categories or multiple choice answers, the responses will be coded as such.

The qualitative data arising from the content analysis will also have a systematic processing procedure. The selected documents will transcribe are analysis, if necessary, and coding according to the themes found in research questions. The content analysis will rely on the hybrid coding approach which is a combination of deductive coding as it is theory driven and inductive coding

as it develops out of the data itself. This way will be able to capture pre-existing themes from the literature and at the same time discover new patterns in order to identify others that arise from the content itself. The coding will be performed in NVivo or in Atlas.ti, which are specialized software tools to analyze qualitative data. These are the tools which will help in efficient coding, categorizing, and theme extraction. Additionally, the statistical method of Excel will be used for frequency counts of the identified themes, and sentiment analysis tools may be used to assess the tone of the documents with respect to the adoption of AI in the industry.

3.4.3 Data Analysis

The data obtained from the survey will be appropriated by using several statistical analysis methods to establish an overall picture of the impact of AI in the P&C insurance industry. Descriptive statistics such as the mean, median and standard deviation of the Likert scale responses will be calculated. These measures will help find out the central trends and patterns of the data especially vis-a-vis operational efficiency, customer satisfaction, and the impact of AI on intermediary roles.

Correlation analysis will be performed by using Pearson's correlation coefficient in order to determine the relationship between two variables, such as familiarity with AI and how AI will impact the customer service or efficiency of operation. This analysis will permit to find out if there are certain relationships between factors, and to what extent do they exist.

Regression analysis will be used to investigate how independent variables (chosen variables-the more human they are, the better, such as familiarity with AI) impact dependent variables (chosen variables-how will AI affect customer service). This will help to understand the contribution of various factors involved in the impact of AI on the P&C insurance industry.

ANOVA (Analysis of Variance) will be used to test for any significant difference in perceptions among the different groups. For instance, the answers from professionals operating in the traditional insurance firms will be compared with those working in the Insurtech companies to see if the perceptions of AI adoption are significantly different. This should yield some information about how the use of AI might differ among different segments of the industry.

Finally, t-tests will be used to compare the differences between groups with high and low familiarity with AI and allows them to consider whether experience with AI will affect the perceptions of its impact.

The results of these analyses will be displayed using bar charts, histograms, and scatter plots so that the data can be interpreted and presented in a more easily understandable way. These visualizations will help to clarify trends, correlations and differences between groups, in order to make the findings accessible.

For the content analysis, the qualitative data will be analyzed to develop major themes concerned with AI's role in the P&C insurance industry. These themes will be compared to the findings from the survey to see if there is any alignment or if there are discrepancies. Frequency and co-occurrence tables will be used to determine the frequency with which certain themes are used in different types of documents. Cross-tabulation will assist is comparing these themes in the various sources of data, and thematic clustering will help to reveal broader patterns within the qualitative data.

The results from the content analysis will then be compared with the quantitative survey results in order to triangulate the data presented and draw on more nuanced conclusions about the impact of AI in the P&C insurance sector.

3.5 Limitations

This research study has a number of limitations that have the potential to influence the validity and generalizability of its findings. There is one important constraint, however - the qualitative nature of the data. Although it can be argued that this is a largely quantitative survey of the P&C insurance industry, qualitative data is naturally subject to bias, people and their experience; the information coming from the participants was open to subjective interpretation. Since the survey is open-ended, participants may take different things from the questions based on their personal backgrounds, understanding of AI, and experiences within the industry in particular. This can result in different interpretations of the same question being taken into consideration,

which could affect the uniformity and fairness of the responses. Beyond this, the results could potentially be clouded by subjective factors, as the participants may not have all been on the same page and were thus offering answers from the perspective of their own views rather than ones that necessarily applied to all of them.

A second limitation is related to the illustration of the sample. While the study employs random sampling, there is the potential that the sample may not effectively represent the diversity and complexity of the P&C insurance industry. For example, established insurance companies could have vastly different adoption and views on AI as compared to newer Insurtech companies or companies coming from emerging markets but in early stages of implementation. This might lead to an imbalance, underrepresentation of voices, in particular from smaller or technologically conservative organizations. Thus, though the sampling strategy was orientated to diversity, it is still possible that there are sectors or angles of regionality that may not have been sufficiently represented.

The study also suffers logistical constraints, more specifically, in the process of data collection. Although Google Forms proved to be an effective aid for distribution of the survey, self-reporting data can be misleading. The tendency for respondents to give inaccurate or even misleading answers is also well known, particularly in the case of surveys about topics sensitive to parties, like technology adoption of AI or worries about regulation and security measures for AI technologies. Also, the extent to which participants are willing and able to complete the survey may be affected by their familiarity with the digital technology referred to in the questions of the survey. Some respondents may be less inclined to participate if the subject matter is uncomfortable for them or the questions are too invasive for them. Furthermore, although survey data were processed using Python for facilitating analysis, even though some steps could be automated, cleaning and interpretation of huge amounts of data are still susceptible to human error.

Another limitation is that when sensitive information is being gathered, it is not always the easiest to keep the process confidential or to secure data. Although the study stressed again on the importance of anonymity to ensure that participants' privacy is protected, there are inherent issues

in protecting sensitive industry data. For instance, AI regulation-related responses, data privacy responses or internal company-related strategies may inadvertently disclose company-level information. Even with security measures in place to store the data and to ensure its integrity, some respondents may still feel uncomfortable or wary about providing sensitive information and as a result, incomplete or biased responses may not be gathered.

Finally, the study is based upon a limited time frame for collecting the data, which can affect the depth of responses and the ability to obtain responses from a wide spectrum of respondents in various areas or industries. The two-week period for the survey was somewhat short and it may not have provided a broad and representative array of perspectives in the P&C insurance industry. This time constraint for data collection may have limited the possibility of collecting data from a larger or more diverse sample of professionals.

3.6 Ethical Assurance

This study has been conducted in a way that is ethically sound throughout the research process. A lot of ethical considerations were put in the experiment to ensure that the rights of the participants are respected, their data secured, the results and findings would not be biased or prone to manipulation.

First, the study involved informed consent from all the participants. Before answering the survey, all the objectives of the research were explained to the respondents, the nature of questions the respondents will be asked, while also giving them the right to withdraw from the research at any time without answering any questions. Respondents were assured of anonymity and the survey participation was voluntary and that their responses would be utilized for academic research purposes only. This strategy was used to give participants an understanding of what the study was about and what they were participating in.

Confidentiality and data privacy were of prime importance throughout the course of the research. No personally identifiable information was collected in the survey and the identities of the participants were kept anonymous. All the responses of the survey were safely stored in the

Google Sheets data. The data was encrypted with a password and it was secure with security protocols of the data storage platform, so that it could not be accessed or tampered with by unauthorized persons.

The survey was designed carefully so that no questions were intrusive or too personal. The interest was more in the professional experiences and opinions of participants towards the adoption of AI in the P&C insurance sector. Questions were phrased in a neutral way to prevent leading the participants to any specific answer and to minimize bias towards a response. Efforts were taken to ensure that the questions respected the views and experience of participants but maintained an academic rigor.

Further, great efforts were made to minimize harm towards the participants. Given the nature of the study, which addressed sensitive topics, like adoption of AI, also dealing with regulatory issues and transformation of intermediaries in the insurance industry, there were safeguards in place to ensure that participants did not experience undue stress and discomfort. Participants were assured they could skip any question they did not feel comfortable answering, which offered an additional level of protection from the potential harm.

The right to withdraw from the study was clearly communicated to all the subjects. They were told that their participation was voluntary and that they could exit the study at any time without any penalty or repercussions. If a participant chose to withdraw, his or her data would not be included in the analysis, doing so to ensure his or her ability to opt-out without negative consequences.

3.7 Summary

This chapter demonstrated a research methodology for AI transformative role in P&C Insurance industry. A mixed methods approach that combined the use of quantitative and qualitative data collection methods was used to provide a comprehensive analysis. The quantitative component involved a survey surveying 196 professionals in the industry, which covered the topic of how AI contributes to efficient operations, jobs for intermediaries, customer satisfaction, and

regulation of issues. The survey was conducted on 5-point Likert scale and the data thus obtained was analyzed using statistical techniques of regression analysis, analysis of variance and correlation analysis.

The qualitative part was based on content analysis of secondary data that included academic literature, corporate reports, regulatory guidelines, industry research and consumer facing documents. This analysis aimed to corroborate and add to the findings of the survey through a pattern analysis to pinpoint patterns and trends of AI taking up in the industry. Stratified purposive sampling was done to select relevant documents.

The sample of companies included both traditional insurance companies and Insurtech companies, so the input of a broad variety of perspectives was included in the analysis. Online survey with Google form was used for data collection and content analysis via NVivo or Atlas.ti was used for the analysis of data that was collected through the online surveys and results from both the components were triangulated to increase validity and richness of the analysis.

The study was not free of limitations (bias for qualitative data and lack of ability to obtain full representation from all areas of the industry). Ethical considerations of research process such as informed consent, confidentiality and right to refuse procedure were carefully considered during research process to ensure data and privacy of research participants.

CHAPTER IV:

RESULTS

4.1 Introduction

This chapter summarizes the findings from the research about AI role in the P&C insurance sector - particularly in relation to how it is fueling the phenomenon of disintermediation while also changing the ways traditional businesses operate. The results are presented on the basis of the quantitative survey and the qualitative content analysis, and the sum results provide a holistic picture of the findings.

The quantitative analysis attempted to collect statistical data from industry experts, which could throw light on the operational, customer service, regulatory, and ethical effects in connection with AI on the P&C insurance industry. A total of 196 respondents filled in the survey and their responses were analyzed through regression analysis, ANOVA and correlation analysis. Based on this analysis, we are able to identify patterns and correlations that are related to the role of AI in redefining the role of interdependent work, the work effectiveness, and the customer experience.

The qualitative content analysis was based on the systematic review of secondary data sources (academic literature, corporate reports, regulatory guidelines and industry research). The content analysis was carried out for a deeper understanding of the associated regulatory, ethical and operational issues present associated with the adoption of AI in the industry. the qualitative part of the research, the methods of deductive and inductive coding were used to aim to identify AI related themes of disruptions, challenges and new trends in the insurance industry P&C.

Together, these two approaches make it possible to have a rounded approach to understanding the transformative effects of AI, so that both general statistical patterns and subtle observations are captured. In what follows, we will outline the main results obtained during the quantitative and qualitative analysis, which leads to the conclusion that the introduction of AI technologies is having a strong impact on the development of the present insurance industry.

The findings in this chapter are organized around the four primary research questions (RQs) guiding this study:

RQ1: To what extent has AI improved the efficiency, accuracy, and speed of core insurance processes such as underwriting, claims processing, and customer service?

RQ2: How has the reliance on traditional intermediaries in the P&C insurance sector changed since the implementation of AI solutions?

RQ3: How do customers perceive the service quality, trust, and satisfaction of AI-driven services compared to traditional human-mediated services?

RQ4: What are the key regulatory, ethical, and data privacy concerns associated with AI adoption in P&C insurance?

Each of these research questions are examined using a mix of quantitative information, qualitative understanding and synthesis of findings from primary and secondary sources. The chapter starts with a detailed presentation of the quantitative result, followed by the content analysis findings, ending with a comprehensive presentation of the analysis that underlines important trends, discrepancies and areas that could be explored in the future.

4.2 Results

Findings: Profiles of the study participants

The quantitative results of this research contribute important information to the impact of Artificial Intelligence (AI) in the Commercial Property and Casualty (P&C) insurance industry from an operational perspective in terms of efficiency, role of intermediaries, perception by the customer and regulatory and ethical concerns. Using a combination of descriptive statistics, regression analysis, analysis of variance (ANOVA) and exploratory factor analysis, the study explores the degree to which AI has improved on the core insurance processes of underwriting, claims processing and customer service. Additionally, the study examines the changing landscape of relations between AI and conventional insurance intermediaries, as well as the perception of AI-based services by both industry participants and policyholders. The subsequent section offers

a detailed analysis of these results and throws light on the varying levels of AI adoption in the industry, along with a few key factors affecting the effectiveness, trustfulness, and ethical ramifications of AI technologies in the P&C insurance landscape.

Table 4.1
Profiles of the study participants

Job Similarity	**Demographic Similarity (Years of Experience)**	**Job Position (Type of Primary P&C Insurer)**
Commercial P&C Buyers (n = 132)	1–5 yrs: 12 6–10 yrs: 35 11–20 yrs: 55 20+ yrs: 30	Traditional Insurers: 110 InsurTech: 22
Insurance Intermediaries (n = 64)	1–5 yrs: 13 6–10 yrs: 23 11–20 yrs: 15 20+ yrs: 13	Traditional Insurers: 45 InsurTech: 19
Total Participants	196	196

Demographic Findings:

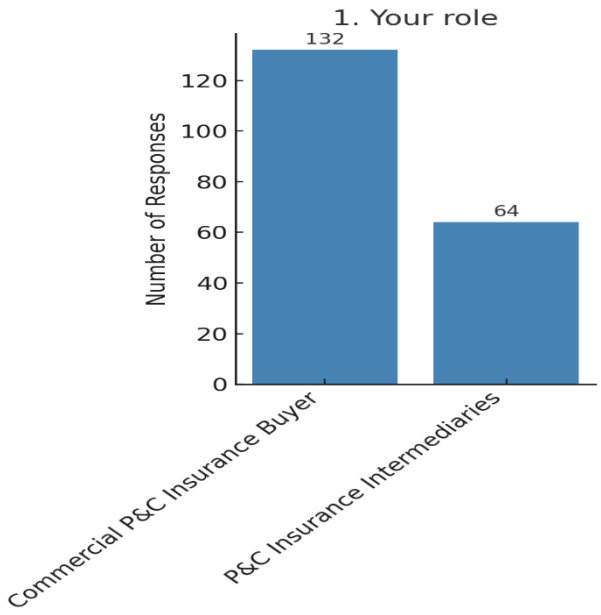

Figure 4.1
Distribution of Your Role in Commercial Property and Casualty Insurance

According to the results of the questionnaire, a higher percentage of respondents characterized themselves as P&C Insurance Buyers (n = 132) than as P&C Insurance Intermediaries (n = 64). The overall response pool comprised roughly two-thirds buyers, and about one-third intermediaries.

Interpretation

This distribution indicates that the sample may be somewhat more representative of the views of commercial insurance policy holders as opposed to insurance practitioners engaged in underwriting or sales, or who are part of the digital transformation process. This is a useful composition of a study dealing with AI-driven disintermediation in P&C insurance because it gives access to both sides of the insurance transaction: the service provider (intermediaries) and the service recipient (buyers). The increased number of policyholders in the survey may also reflect increasing interest or concern among buyers about the way in which AI is impacting on service

quality, transparency and their direct relationships with insurers - key areas of discussion in the study on displacement through intermediaries. However, lower generalizability may detract from the intermediary response rate due to the limited representation of industry practitioners' professional experiences and attitudes.

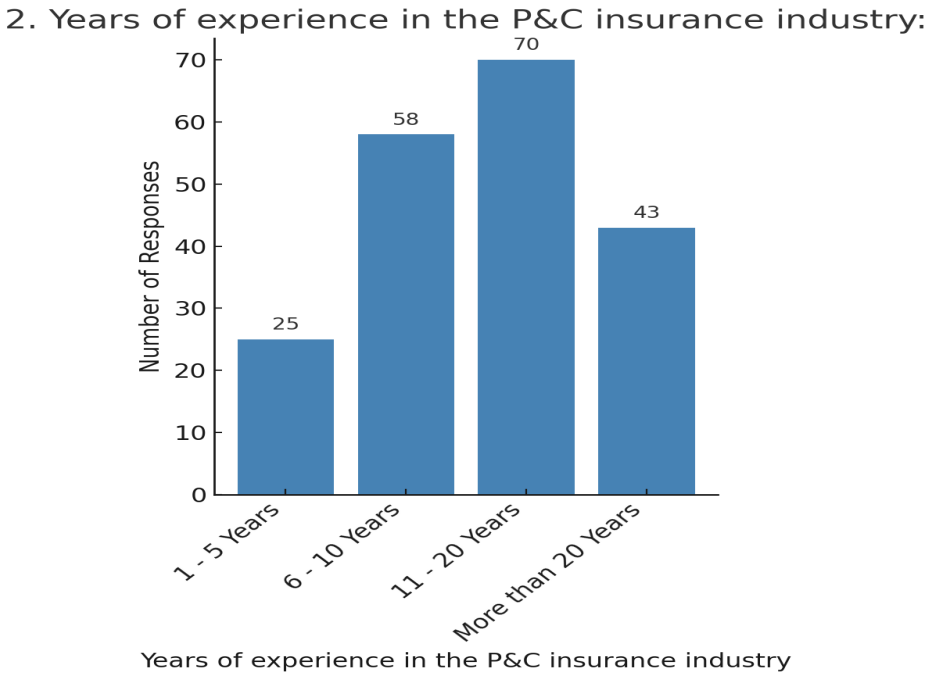

Figure 4.2
Distribution of Years of Experience in the P&C insurance industry

The graphical distribution gives an idea of the splitting of respondents by how many years they have worked for a P&C firm. The average number of years experience for the participants was 11-20 years, which is reported by 70 participants. This is followed by the 58 respondents with 6-10 years of experience, by 43 respondents with 20+ years of experience, and the group of respondents with 1-5 years of experience, 25 respondents, which is the lowest.

Interpretation

The profile of respondents indicates that the sample used in the survey is largely made up of experienced professionals, which has important consequences for the validity and richness of the information on the topic of AI adoption and disintermediation within the P&C sector. We

also found that among respondents with over a decade of experience (113 respondents with 11+ years), most of the responses were derived from people that are likely to have experienced and observed the shift from more human-centric, traditional models to more digitized AI-enabled frameworks. The age and experience of this population adds confidence to conclusions on comparative relative effectiveness comparing AI networks and human intermediaries because they are the sole population with first-hand awareness of the pre-AI regimes of operation. Furthermore, the relatively small proportion of respondents with just 1-5 years of experience indicates that they are not well represented by newer-professionals who may have joined the industry during or following the wave of digital transformation. As a result, the results will most likely capture the perspective of those rooted in legacy systems, providing a more critical perspective on AI integration and the effects of its emergence on trust, personalization and the need for mediators, as is outlined in the research proposal.

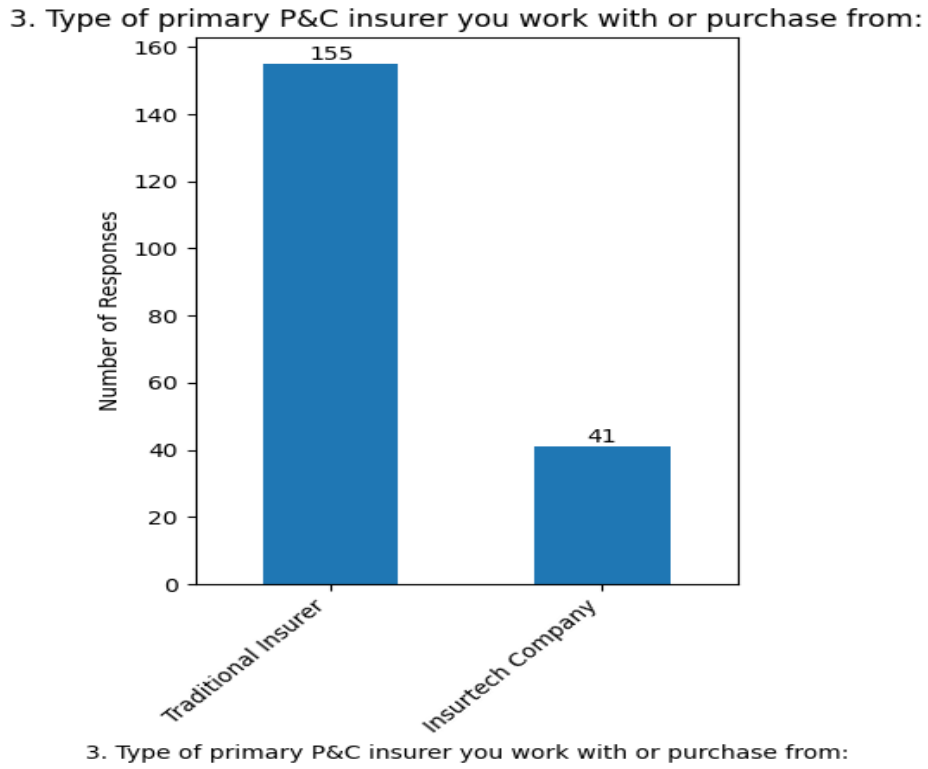

Figure 4.3
Distribution of Type of primary P&C insurer you work with or purchase from

A distinct hegemony of conventional insurance providers among the respondents is evident from the chart. Of the total sample size, 155 said that they work with or purchase from a traditional P&C Insurer and 41 said that they are associated with Insurtech companies. The results of this indicate a significant preference for established insurance providers in the surveyed population.

Interpretation

The data indicates a very strong preference for institutions in the P&C sector which are based on traditional insurers. The relatively low level of Insurtech companies engagement could signify that trust in traditional underwriting and claims is high, as well as pre-existing service relationships and regulatory knowledge. Conversely, though there was a significantly lower number of signals, there is evidence of an incipient technology-driven segment that is frankly beginning to take off in the form of respondents connected with Insurtech companies. A difference in these figures may also indicate different levels of organizational readiness to undergo digital

transformation, opposition to automation or doubts about the maturity and reliability of AI-based systems. Overall, the findings show that, despite the innovation, the traditional insurers remain the main protagonists in the landscape.

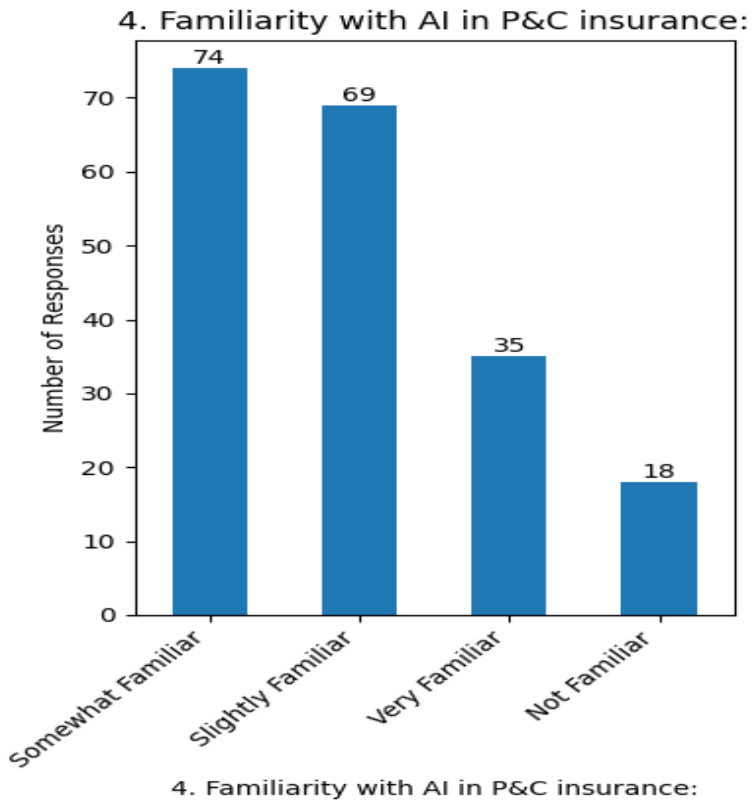

Figure 4.4
Distribution of Familiarity with AI in P&C insurance

Distribution of responses reflects a different level of familiarity over AI, in the context of P&C. The largest population of respondents 74 people considered themselves "Somewhat Familiar" which was followed closely by 69 respondents who considered themselves "Slightly Familiar". A smaller category, 35 people said they were 'Very Familiar with AI applications in this area' when it came to applications aimed at managing chronic conditions. Only 18 respondents said that they were "Not Familiar" with AI at all. The results show a concentration in moderate levels of an awareness.

Interpretation

The data shows that majority of the respondents have a basic, to intermediate level of understanding of AI in the context of insurance, with a relatively few respondents indicating a high or no understanding level. This trend indicates a growing awareness amongst the general public of the existence of AI and its applications, but it might also suggest that consumers and users are at the early phase of adopting it both technologically and operationally. The low percentage of respondents reporting themselves as "Very familiar" could reflect a disconnect between general knowledge and close monitoring and use of AI tools, while the lack of change in the number of respondents reporting as "Not familiar" suggests that AI is becoming an inescapable part of industry conversations. These insights represent a transition phase for the sector as the technology is known and partially understood, but it is yet to be widely skilled in or adopted.

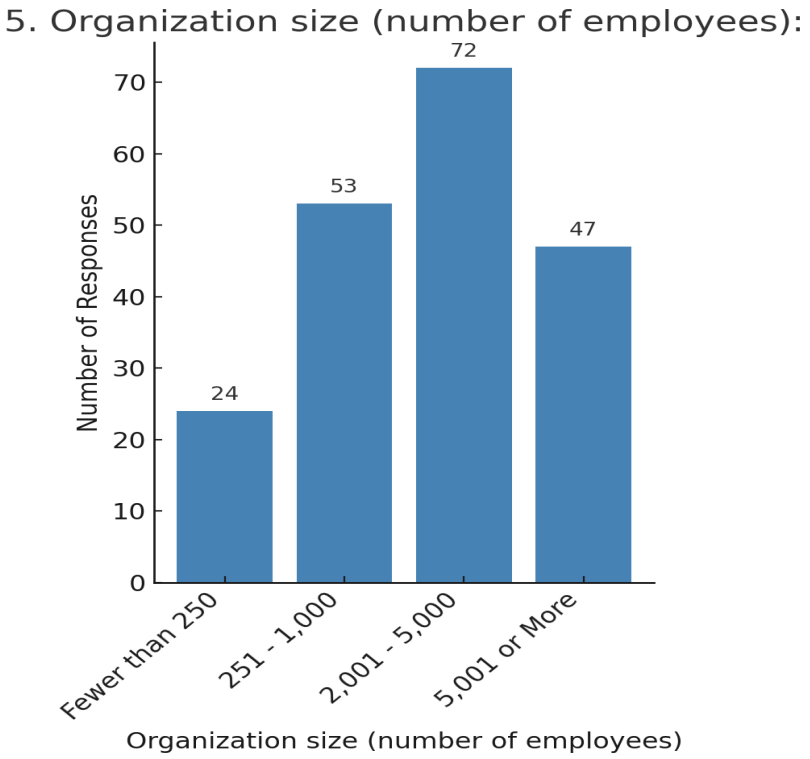

Figure 4.5
Distribution of Organization size (number of employees)

The distribution of respondents by their organization size in terms of the number of employees is shown in the chart below. The largest group of respondents (72 respondents) work in organizations employing 2,001 to 5,000 persons. In this is followed by 53 respondents from organizations with 251 to 1,000 employees and 47 respondents from firms with 5,001 or more employees. The smallest group consists of 24 respondents who are affiliated with organizations which have fewer than 250 employees. This would imply a concentration of respondents from medium to large-scale enterprises.

Interpretation

The data indicates that most respondents come from medium to large enterprises, where business complexity and available resources provide the opportunity and/or necessity for incorporating high-tech advances like AI. The existence of a high concentration of large-scale firms, especially those that employ more than 2,000 people, is a sign of organizational settings that are likely to have the infrastructure and strategic focus to test or implement AI-powered solutions in the P&C insurance functions. It is also possible that the relatively weaker presence of respondents who hail from smaller organizations is because of a low level of participation from that segment, or because technological change is not perceived to be relevant at such environmental levels. Overall, the respondent profile reflects organizations in which structured processes and technology adaptation have an important influence on insurance working practices.

Findings: Research question results.

This section presents the core findings derived from both the quantitative survey of 196 participants and the qualitative content analysis of academic, corporate, and regulatory documents, structured around the four main research questions of the study. Each research question explores a critical dimension of how AI is transforming the P&C insurance industry through disintermediation and digital transformation. The results provide a comprehensive overview of (RQ1) the extent to which AI has enhanced efficiency, accuracy, and speed across core insurance processes such as underwriting, claims handling, and customer service; (RQ2) the evolving

reliance on traditional intermediaries and the emergence of new advisory roles; (RQ3) the shifts in customer perceptions of service quality, trust, and satisfaction in AI-enabled interactions; and (RQ4) the regulatory, ethical, and data privacy implications associated with AI integration in the insurance ecosystem. Together, these findings offer a triangulated understanding of how AI-driven technologies are reshaping both operational and relational dynamics within the P&C insurance sector, highlighting a convergence of technological efficiency and human oversight that defines the emerging structure of the modern insurance landscape.

Findings for RQ1. To what extent has AI improved the efficiency, accuracy, and speed of core insurance processes such as underwriting, claims processing, and customer service?

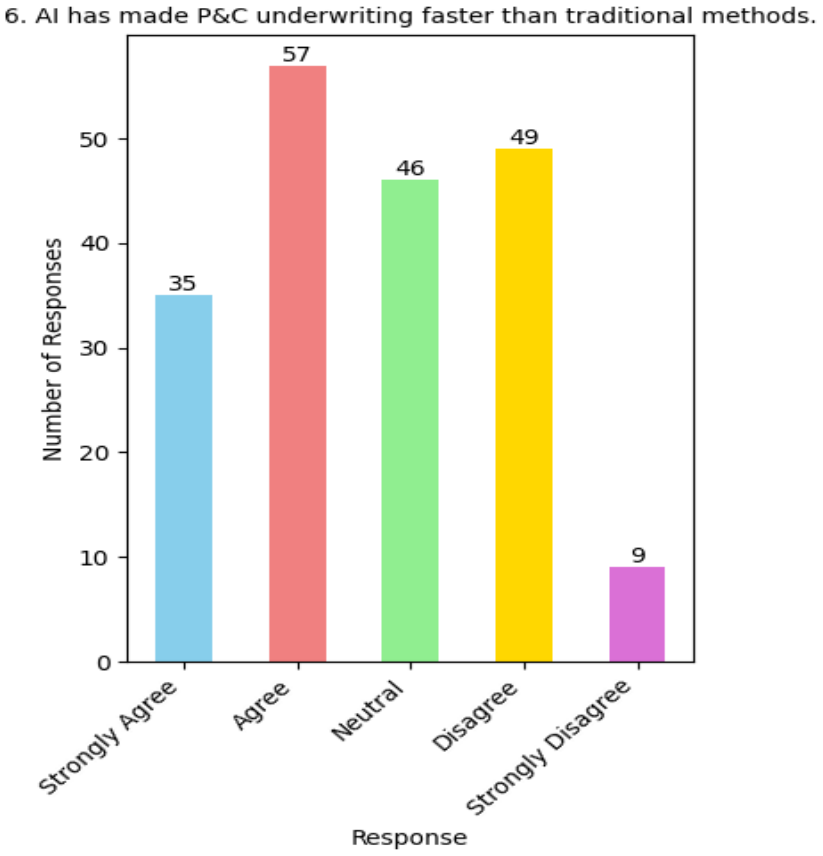

Figure 4.6
Distribution of AI has made P&C underwriting faster than traditional methods.

Insurers: According to the responses to this item, there is a positive but mixed picture for the impact of AI on underwriting speed in the P&C insurance sector. A total of 92 respondents agreed or strongly agreed (35 respondents said "Strongly Agree," and another 57 respondents said "Agree" that AI has improved speed of underwriting compared to traditional methods) while 46 respondents were neutral, 49 respondents disagreed, and 9 respondents strongly disagreed. As a result, while there is broad support for the position, there is a significant number of those in the sample who remain skeptical or ambivalent.

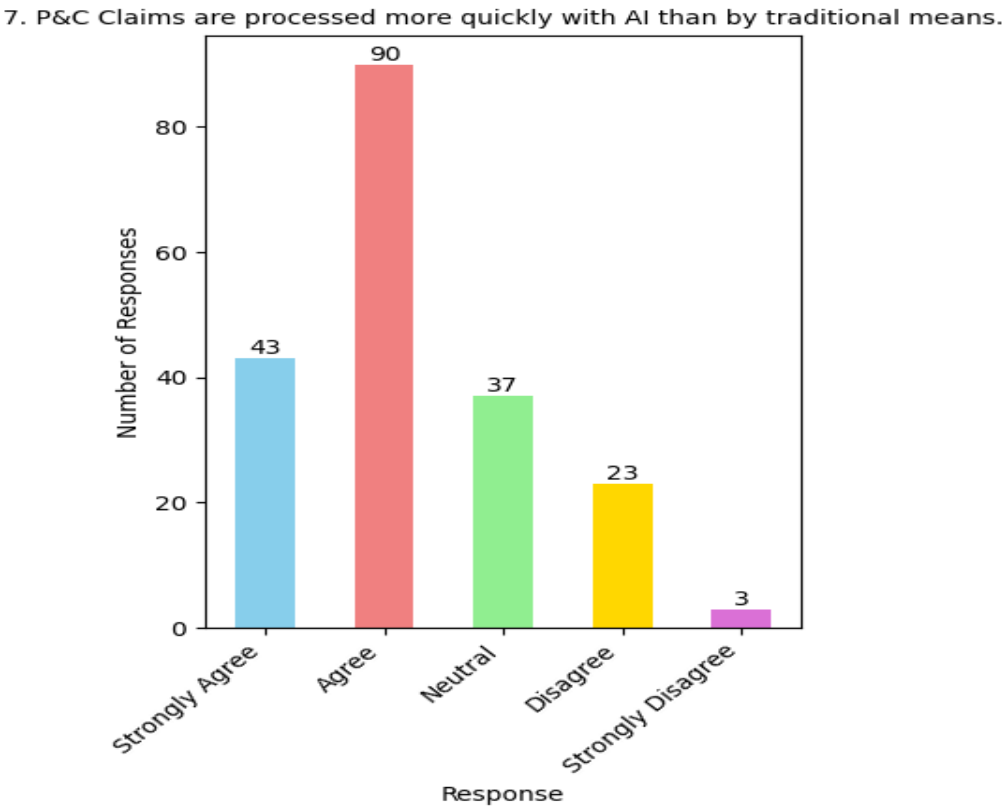

Figure 4.7
Distribution of P&C Claims are processed more quickly with AI than by traditional means

The response distribution shows a generally positive view about the impact of AI on the effectiveness of claims processing. A total of 133 respondents agreed with the statement including 90 agreeing with the statement of "Agree" and 43 agreeing with the statement of "Strongly Agree."

A further 37 respondents were neutral. A minority were disagreeable with the statement, with 23 respondents saying "Disagree" and only 3 saying "Strongly Disagree."

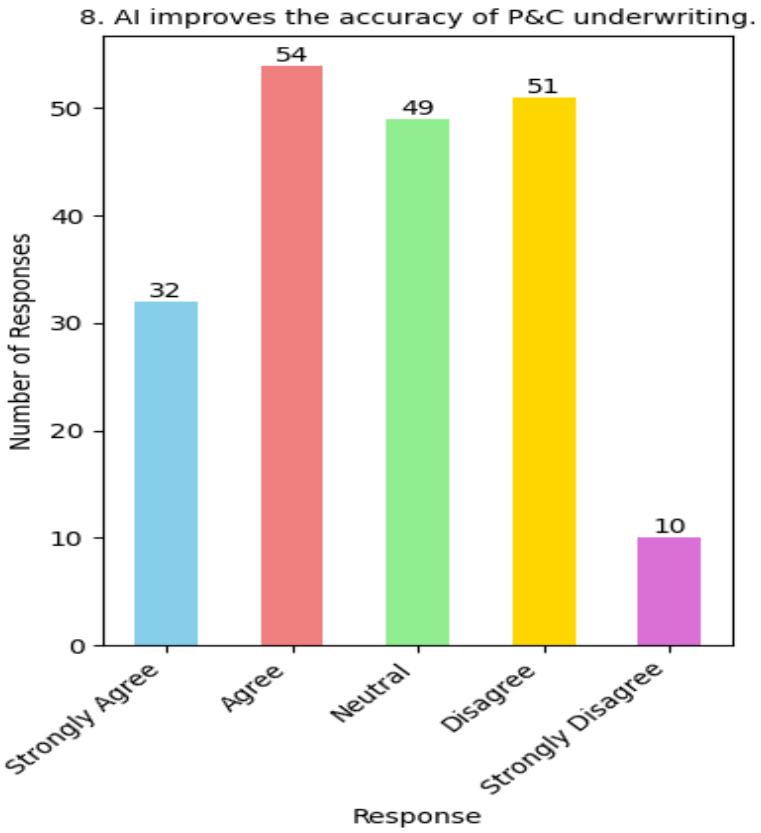

Figure 4.8
Distribution of AI improves the accuracy of P&C underwriting

The distribution of the responses reflects a divide but slightly positive opinion as to whether AI will help or hurt the accuracy of underwriting. A total of 86 agree, of them 32 choose "Strongly Agree" and 54 choose "Agree" Meanwhile, 49 respondents were of neutral opinion, and 51 agreed (meaning disagreement). Only 10 chose "Strongly Disagree," the smallest number.

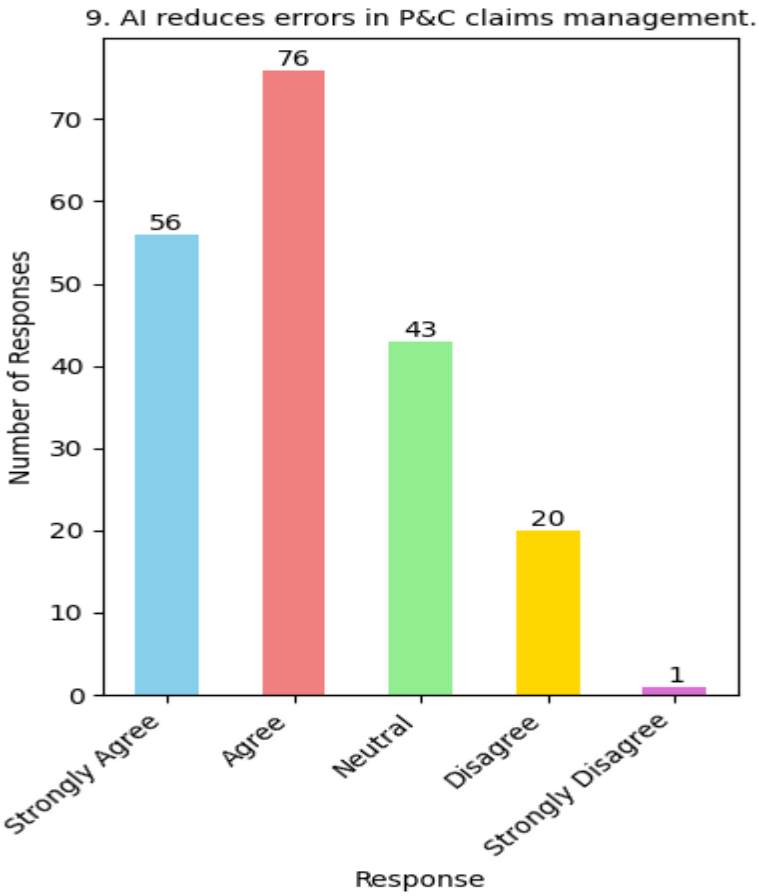

Figure 4.9
Distribution of AI reduces errors in P&C claims management

The responses are characterized by a strong positive trend towards the belief that AI will play a role in reducing the errors that are associated with P&C claims management. A total of 132 respondents agreed with the statement, including 76 who chose the "Agree" option and 56 respondents who chose the "Strongly Agree" option. There were also 43 respondents who remained neutral, 20 who disagreed, and only 1 who strongly disagreed, which shows there is little opposition towards the claim.

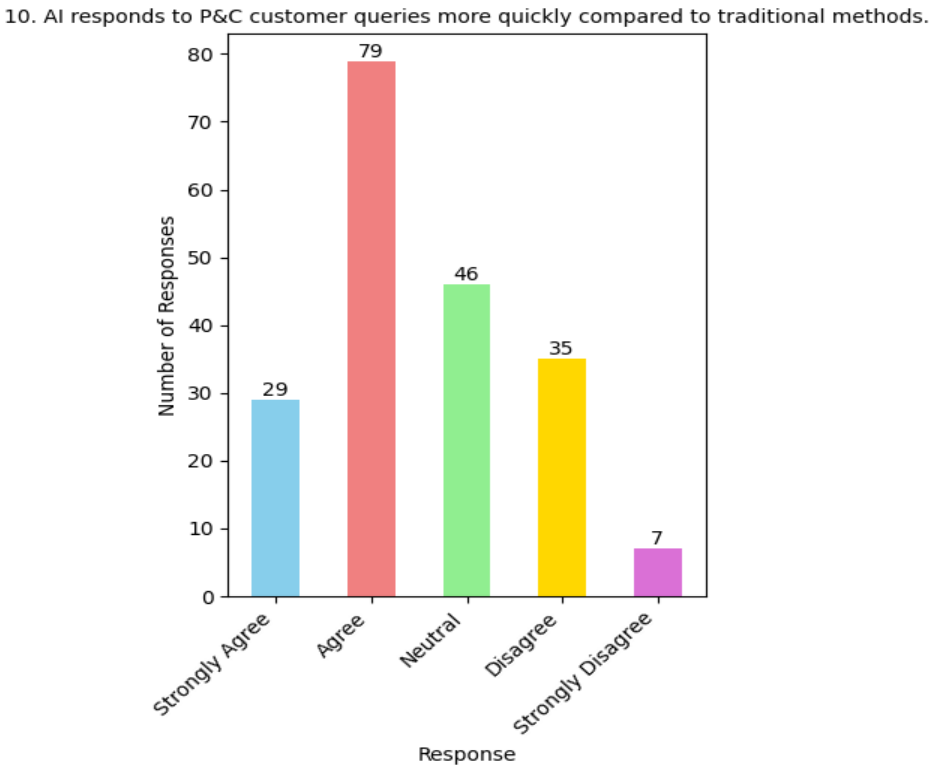

Figure 4.10
Distribution of AI responds to P&C customer queries more quickly compared to traditional methods

The data has shown a general consensus that AI improves the pace of customer query handling in P&C insurance industry. 79 respondents chose "Agree" and 29 chose "Strongly Agree" collectively forming majority of sample. 46 have neutral position while 35 did not agree & 7 disagreed, showing that the logic of AI is not much convinced in the hands of fewer segment.

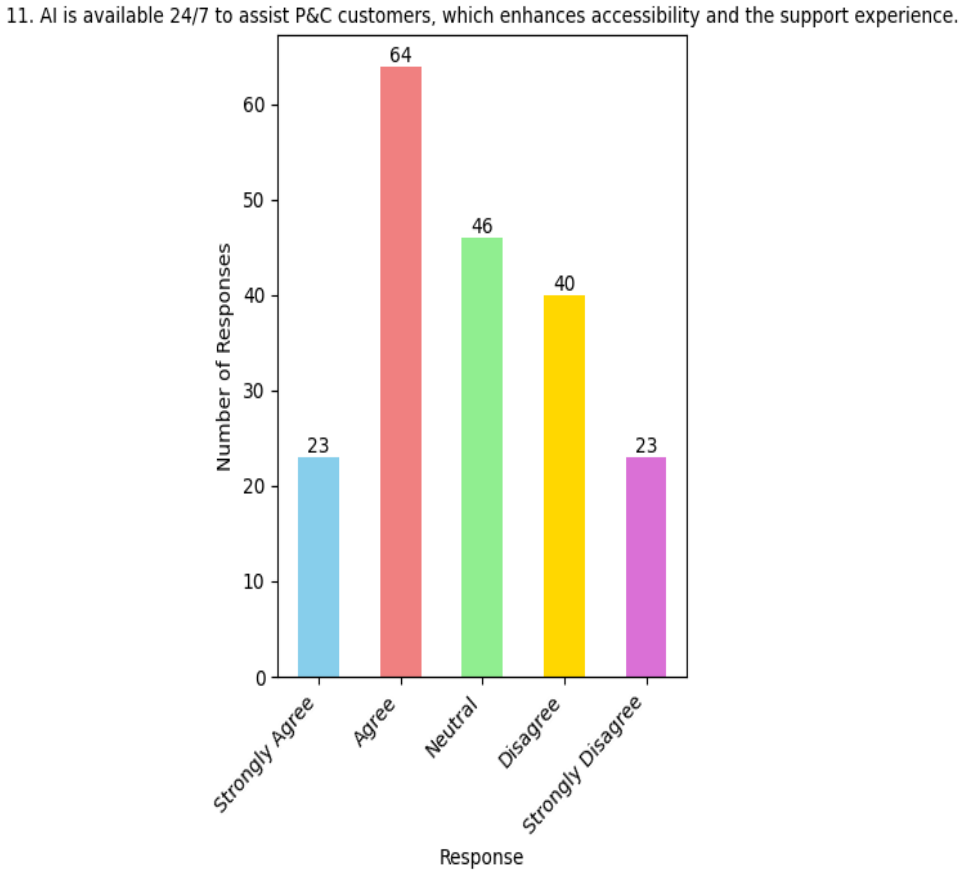

Figure 4.11
Distribution of AI is available 24/7 to assist, which enhances accessibility and the support experience

The responses to this item show a diverse distribution of opinion. 64 respondents chose "Agree", and 23 people chose "Strongly Agree" showing overall agreement by 87 participants. However, a large amount of people 46 responses chose a neutral stance. The flip side of this scale shows that 40 people selected the word "Disagree" and 23 chose "Strongly Disagree" suggesting that there is a relatively large percentage of people with the opposing opinion.

Summary of Section 1 graphs:

Section 1 market survey responses show that there is a generally positive but nuanced view of how AI is helping P&C insurance operations. A clear majority of participants confirmed that AI helps speed up the underwriting and claims handling, which could indicate the recognition of their ability to automate traditionally time-consuming processes. However, opinions were more

divided on the effect of AI on underwriting accuracy, where support was shown but by a notable proportion of neutral or adverse references, indicating the existence of continued skepticism or variable results between organizations.

Finally, in the context of claims management, there was a strong consensus that AI can help to decrease the rate of errors, which underlines the sense of trust in the reliability and consistency of AI. When discussing AI's performance in customer service, participants were largely consistent in that AI increases the speed of response in addressing a customer's query, but there was less consensus on whether customers could get access to the AI at any time. A significant number of respondents felt that both forms of AI activity were not available to them, which suggests that there may still be a gap between theoretical availability and user experience as perceived by the respondents.

Overall, these results indicate that there is a general perception that AI is being seen as an enabler in P&C of efficiency and accuracy, however its perceived value is influenced by differences in implementations, contexts, and user expectations.

Test: Regression Analysis:

OLS Regression Results

Dep. Variable:	Operational Functions	R-squared:	0.264
Model:	OLS	Adj. R-squared:	0.253
Method:	Least Squares	F-statistic:	23.00
Date:	Thu, 28 Aug 2025	Prob (F-statistic):	9.17e-13
Time:	12:57:01	Log-Likelihood:	-214.58
No. Observations:	196	AIC:	437.2

```
Df Residuals:                          192   BIC:
450.3
Df Model:                                3
Covariance Type:                nonrobust
==============================================================================
coef    std err          t      P>|t|      [0.025      0.975]
------------------------------------------------------------------------------
const                  2.4167      0.172     14.033      0.000
2.077       2.756
Slightly Familiar      0.8370      0.193      4.328      0.000
0.456       1.218
Somewhat Familiar      1.1824      0.192      6.158      0.000
0.804       1.561
Very Familiar          1.6500      0.212      7.786      0.000
1.232       2.068
==============================================================================
Omnibus:                        2.714   Durbin-Watson:
1.807
Prob(Omnibus):                  0.257   Jarque-Bera (JB):
2.560
Skew:                           0.280   Prob(JB):
0.278
Kurtosis:                       3.002   Cond. No.
7.80
```

R-squared = 0.264, Adjusted R-squared = 0.253

The model accounts for around 26.4% of the variance in perceived improvement in functional aspects of operation (underwriting speed, claims efficiency, accuracy, etc.). This represents a moderate effect size and is therefore suggestive of a meaningful proportion of variation in perceived operational benefits being explained by familiarity with AI.

F-statistic = 23.00, $p < 0.001$

The overall model is statistically significant which means that the combination of these different levels of AI familiar are a better predictor of perceived improvement on operational functions than chance.

The coefficients of regression relate to the difference in the score of perceived operational function given for every level of familiarity with AI, in comparison to the reference group ("Not Familiar").

Slightly Familiar:

Coefficient = 0.837, $p < 0.001$

Respondents being a little familiar with AI rate operational improvements 0.837 points higher, on average, than non familiar.

Somewhat Familiar

Coefficient = 1.182, $p < 0.001$

Respondents with some familiarity rate improvements 1.182 points higher which is a substantial and statistically significant increase.

Very Familiar:

Coefficient = 1.650, $p < 0.001$

Those with very familiar rate operational improving scores 1.65 points higher than those of those with no familiarity, the greatest effect size of all of the levels of familiarity.

Interpretation:

The results obtained from the regression model indicate that the AI familiarity has a significant prediction capacity on the improvement in perceived operational function. The model had an R-squared score of 0.264 which explained about 26.4% variance in the perceptions of operational performance level using the level of familiarity with AI. This is a significant proportion and highlights the fact that exposure to AI is an important driving factor in shaping attitudes towards its impact on the key insurance functions.

The results show a clear and positive correlation: the more the level of knowledge regarding AI is, the higher is the perceived value for operational efficiency and performance. These two factors build up the contribution of AI literacy and exposure by people to develop good impressions on the work function of AI.

These results are firmly in line with the literature review in this study. According to Kondeti (2025) and Gundla (2025) commercial P&C insurance works with AI technologies are recognized for their mechanisms that improves underwriting accuracy, lower claims approval times and improved decision making. The statistical measurement of the data presented here supports those statements and validates the claims empirically based on perceptions of industry stakeholders in practice.

Need for enhancing AI literacy enshrined in operational results This progress potential from AI as documented in the wider academic and industry literature and highlights the necessity of increasing AI literacy amongst insurance professionals and policyholders so as to maximize operational results.

ANOVA test:

Result:

```
Variable: 6. AI has made P&C underwriting faster than traditional
methods.
  F-statistic: 21.4977
  P-value: 0.0000
------------------------------
Variable: 7. P&C Claims are processed more quickly with AI than by
traditional means.
  F-statistic: 17.9202
  P-value: 0.0000
------------------------------
Variable: 8. AI improves the accuracy of P&C underwriting.
  F-statistic: 19.1505
  P-value: 0.0000
------------------------------
```

```
Variable: 9. AI reduces errors in P&C claims management.
  F-statistic: 10.9878
  P-value: 0.0000
------------------------------
Variable: 10. AI responds to P&C customer queries more quickly
compared to traditional methods.
  F-statistic: 6.8539
  P-value: 0.0002
------------------------------
Variable: 11. AI is available 24/7 to assist P&C customers, which
enhances accessibility and the support experience.
  F-statistic: 5.1251
  P-value: 0.0020
```

Interpretation:

The resulting findings are consistent with the underlying assumptions of the research which assumes that AI familiarity affects operational perceptions in the insurance domain. The results confirm that the more people are familiar with AI technologies, the more positive their evaluation of AI's role in successive improvements of key insurance processes.

Insurance Product: Efficiency and Accuracy of Underwriting (Q6 & Q8):

The largest F-statistics were obtained for underwriting speed (F=21.50) and accuracy (F=19.15). This is a strong perception among AI-familiar respondents that AI plays a significant role in streamlining the evaluation of risks and the determination of premiums. This is in line with literature reviewed in the proposal (e.g., Kondeti, 2025; Jaiswal, 2023), highlighting the role of AI in speeding and improving underwriting decisions, by automation and using advanced analytics.

Claims Processing (Q7 & Q9):

Claims processing speed and reduction of errors were also negatively and significantly associated with variance (F = 17.92 and 10.99 respectively), indicating that people with greater experiences with AI are aware of its role in claims adjudication including speed and accuracy. Some of these types of perceptions do justify empirical review like Aragani (2024) & Gundla (2025) who stated that there is an actual improvement in claims closure times and fraud detection reliability with the integration of AI technology.

Customer Interaction and Customer Service (Q10 & Q11):

Although F-values were relatively lower (F = 6.85 and 5.13), results for responsiveness to customer queries and AI's 24/7 availability are statistically significant. This implies a more humble but also meaningful impact of AI in improving customer-facing service functions as described in the proposal and supported by studies (e.g., Patil et al., 2024; Uzir et al., 2021) highlighting AI-driven customer engagement platforms like chatbots.

These findings imply that AI familiarity is an important moderating variable of perceived success of digital transformation initiatives in the P&C insurance industry. The differences found were statistically significant, which implies that positive perceptions of efficacy of AI solutions are not uniform across individuals, but rather fluctuate with experience and exposure that users have with AI, which implies the necessity of customized training and change management approaches when deploying AI solutions.

Insurers as well as Insurtech firms should take note that knowing and understanding AI systems has a direct impact on employee and customer buy-in around operational transformation. In order to achieve the most positive impact of AI in underwriting, claims, and service delivery, insurers should not only focus on the implementation of AI tools, but also on the development of familiarity, confidence, and transparency surrounding AI tools for all stakeholders.

Descriptive test:

Result:

Table 4.2
Descriptive Statistics For Impact of AI on Commercial P&C Operational Functions

Variable	Mean	Median	25th Percentile	50th Percentile	75th Percentile	Standard Deviation (SD)
Underwriting faster than traditional methods	3.306	3.0	2.0	3.0	4.0	1.1627
Claims processing quick	3.750	4.0	3.0	4.0	4.0	0.9786
Accuracy of underwriting	3.240	3.0	2.0	3.0	4.0	1.1585
Claims management	3.847	4.0	3.0	4.0	5.0	0.9698
Customer queries resolving	3.449	4.0	3.0	4.0	4.0	1.0585
AI is available 24/7	3.122	3.0	2.0	3.0	4.0	1.2091

Interpretation:

The results show a relatively positive view on the role of AI in increasing operational efficiency in P&C insurance. Most mean values are above the neutral (3.00) and show an overall agreement with the positive impact of AI but with variations depending on the specific functions.

Claims management functions (Q7 and Q9) were the highest rated in terms of mean ratings (3.75 and 3.85 respectively), which also indicates that the respondents feel AI is especially effective in expediting claims processing and reducing errors. These areas exhibit the lowest dispersion (SD around 0.97-0.98) indicating fairly strong consensus among the respondents.

Underwriting-related functions (Q6 and Q8) received a higher SkleranDrate moderate rating (means of 3.31 and 3.24) indicating a more reserved, or mixed, perception of AI's capability in utilizing underwriting speed and accuracy. This is consistent with findings in the literature that underwriting includes complex judgement and risk assessment, which may not yet be automated and/or trusted by AI systems.

Customer-facing functions, in particular, 24/7 support availability (Q11) and query response speed (Q10) were rated lower in comparison to claims-related functions with mean values of 3.12 and 3.45. These scores suggest a perception that although AI might play an important role in accessibility and responsiveness of the interaction, the user experience might still miss expectations, perhaps because of, e.g. the limitations of natural language understanding techniques, personalization, or perceived empathy. Overall, the variation in the standard deviations (ranging from 0.96 - 1.21) represents a wide range of opinions among the respondents that may have been affected by factors such as organizational role, familiarity with AI, and type of insurer.

These findings are in line with the first research objective in the research proposal that seeks to evaluate how AI adoption has changed underwriting, claims processing and customer service. They also support the assertion supported by the literature review that adoption of AI in P&C insurance generates different levels of perceived operational benefit depending on the area of functionality. Claims processing seems to be the area most heavily felt to offer value by AI, with underwriting and customer engagement being two possible areas where perceptions exist between strongly positive and uniformly positive, presumably because of continued reliance on human expertise and trust-building capability.

Summary of Tests:

The results of the statistical analyses conducted for the first research objective indicate that, in the P&C insurance industry, familiarity about AI significantly indicates perceptions about operational improvement. Regression analysis shows that the familiarity with the AI explains around 26.4% of the variance in perceived improvement ratings in core functions such as underwriting, claims processing and customer service, with familiarity with the AI having a positive relation to higher ratings. Further, ANOVA results substantiate these relationships, demonstrating (among other) extremely robust associations in underwriting efficiency and accuracy and claims speed and error reduction - the same areas supported by the literature. It is important to note that these findings are supported by descriptive statistics that show generally

positive perceptions of the operational impact of AI, particularly for use cases in claims management, and more cautious or mixed perceptions for the use cases in underwriting and in customer facing. Collectively, the results underline that operational benefits of AI are not experienced homogeneously but are determined by the interaction and associated exposure to AI tools by stakeholders. These observations emphasize the need for AI literacy and stakeholder involvement to maximize the transformative capabilities of AI in the insurance industry.

Findings for RQ2. How has the reliance on traditional intermediaries in the P&C insurance sector changed since the implementation of AI solutions?

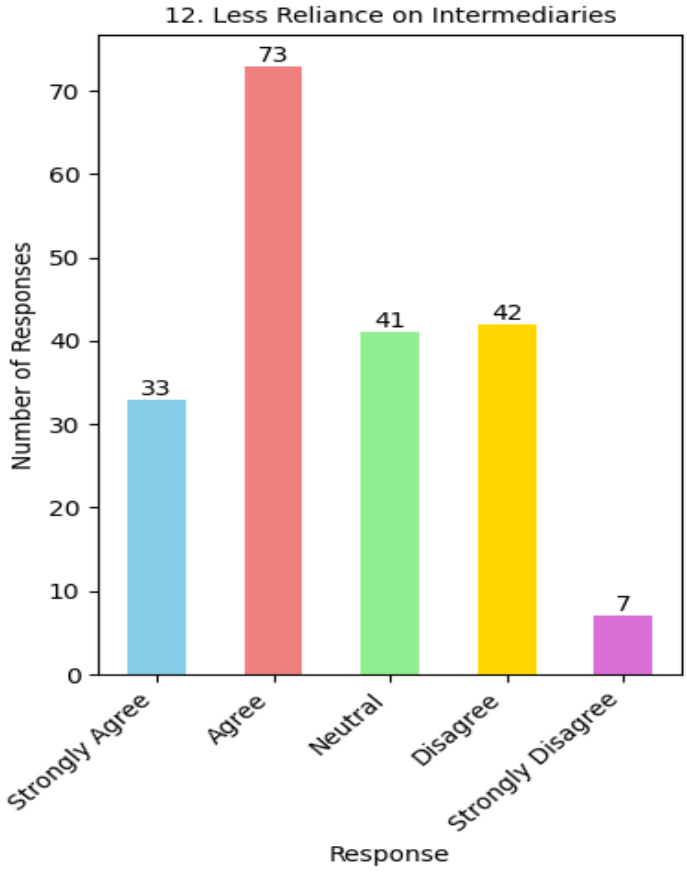

Figure 4.12
Distribution of Less Reliance on Intermediaries

The distribution of responses indicates the leaning towards less often dependent on traditional insurance intermediaries. 73 respondents selected "Agree" while 33 selected "Strongly Agree" indicating that more than half the respondents feel that their use on brokers or agents reduced. Meanwhile, 41 people were surveyed towards a neutral leaning. Most significantly, there was a notable counterbalance to the numbers of those who were supportive of the statement from the number who chose "Disagree" (42) and "Strongly Disagree" (7).

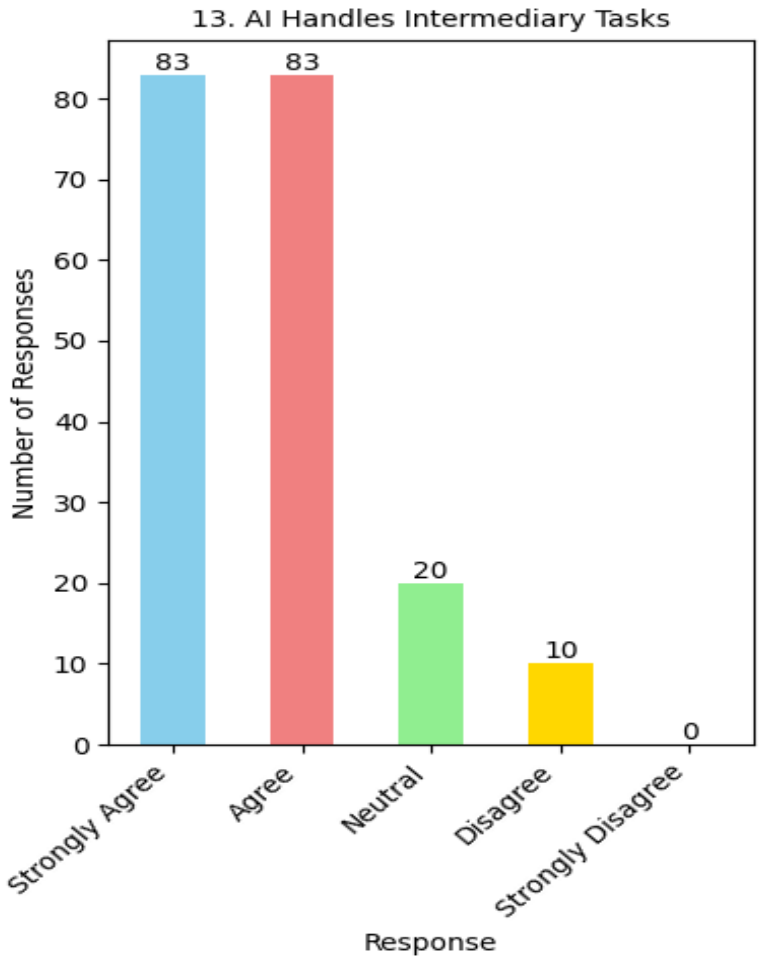

Figure 4.13
Distribution of AI Handles Intermediary Tasks

The chart shows that the respondents are almost unanimously on board in agreeing on the invasion of the space left to the insurance intermediaries by the very nature of AI. Vastly in the majority were responses of "Strongly Agree" and "Agree" which came to a total of 83 responses and "Neutral" for 20 responses and disagreement for 10 responses, while "Strongly Disagree" was overshadowed as it was omitted for all responses.

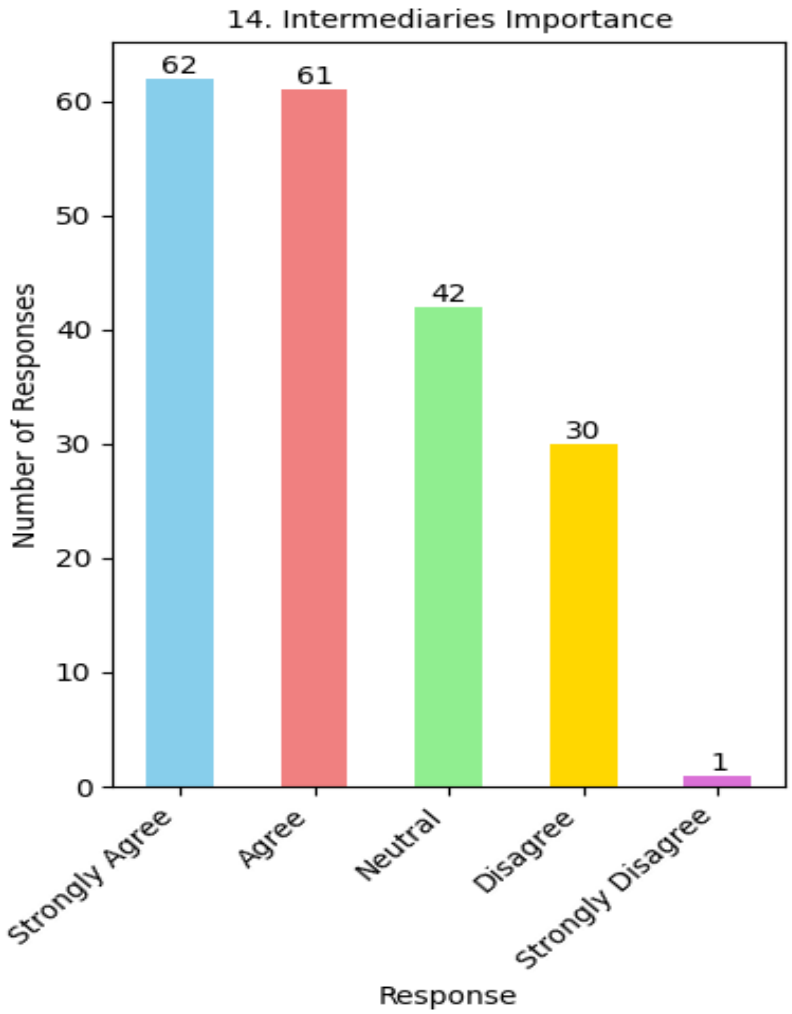

Figure 4.14
Distribution of Intermediaries Importance

The numbers are as follows: 62 people said "Strongly Agree" and 61 people said "Agree" which means lots of consensus. 42 people said they are a neutral opinion while 30 people said, "Disagree", only 1 person chose "Strongly Disagree".

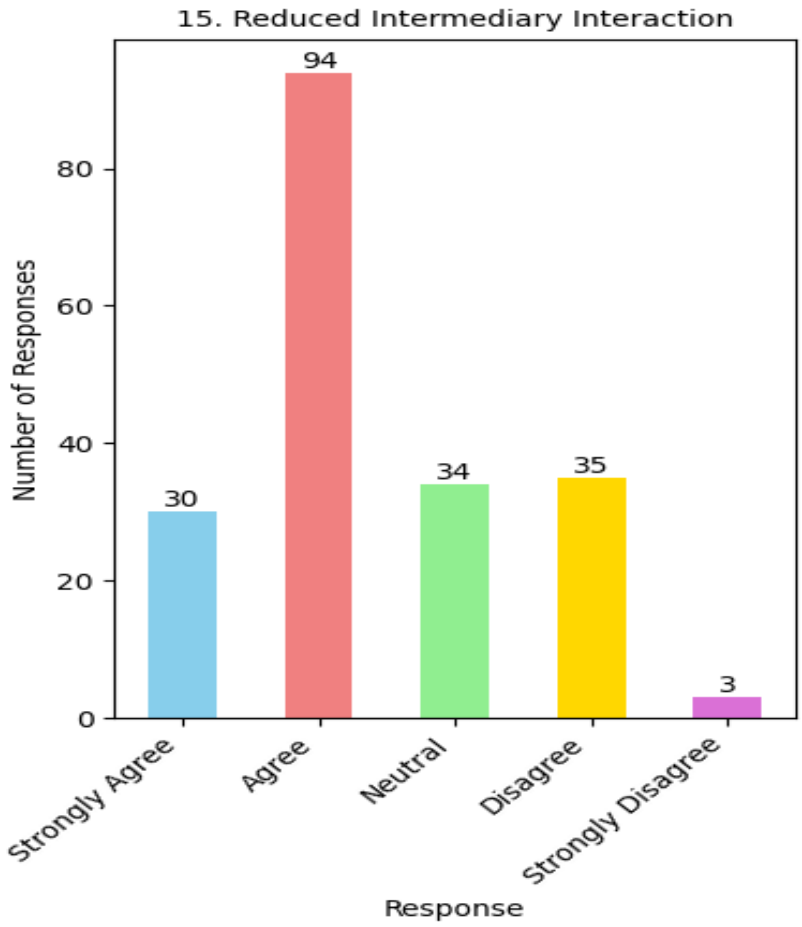

Figure 4.15
Distribution of Reduced Intermediary Interaction

Looking at the chart, the majority clearly agree with the statement 94 respondents mentioned "Agree" and a further 30 respondents mentioned "Strongly Agree." 34 respondents marked their opinion as neutral. On the other hand, there were 35 respondents that chose "Disagree" and just 3 respondents that chose "Strongly Disagree."

Summary of graphs of section 2:

The survey results in Section 2 reveal a complex, and shifting, interaction between AI and traditional roles of intermediaries on the P&C Insurance industry. A majority of the respondents commented that their dependence on brokers and agents has reduced during the last four years, which fits the timeframe of introducing AI-enabled tools and platforms. This is further reinforced by a strong consensus that AI is now carrying out tasks previously managed by intermediaries, such as quoting, on-boarding and servicing of policies.

Despite this definite move towards disintermediation, respondents also offered overwhelming support of the continuing importance of intermediaries for managing complex insurance needs. These results illuminate the persistence of the human capacity for expertise in those areas that demand judgments in context, negotiation, and worth-of-trust capacities present in very limited ways in the technologies that pass for AI.

Additionally, many participants had identified that AI has had the effect of reducing the frequency of their interaction with intermediaries, suggesting a change in behavior in how services are accessed and consumed, even if intermediaries are part of the service architecture. Overall the data paints a picture of a landscape of partial and conditional disintermediation where AI is assuming more operational tasks, but intermediaries play a critical role in types of engagements in which they are needed - a role which cannot be underestimated.

Test: T test:

Result:

```
Variable: 12. I have relied less on brokers or agents or other
intermediators in the last 4 years (since AI was introduced to P&C
insurance).
  F-statistic: 9.6647
  P-value: 0.0000
------------------------------
Variable: 13. AI now handles tasks once done by intermediaries.
  F-statistic: 6.2317
  P-value: 0.0005
```

```
------------------------------
Variable: 14. Intermediaries remain important for complex P&C
insurance needs.
  F-statistic: 5.4550
  P-value: 0.0013
------------------------------
Variable: 15. AI has reduced the frequency of my interactions with
intermediaries.
  F-statistic: 3.2519
  P-value: 0.0229
```

Interpretation:

These results offer compelling empirical evidence to support the argument that the role of traditional intermediaries in the P&C insurance value chain has changed materially due to AI and the nature of its necessity.

1. Disintermediation Proven (Q12 & Q13):

The positive and statistically significant results for:

Q12 ("I have relied less on brokers - agents - brokerage companies")

Q13 ("AI is now taking over tasks that were previously done by intermediaries")

clearly indicate that the respondents feel that there is a reduction of dependence on human intermediaries, a redistribution of intermediary functions across to AI systems This validates the idea of AI powered disintermediation In this context, it pertains to the disintermediation of tasks previously handled by brokers and agents i.e. policy recommendations, premium calculations, claims assistance, etc., with the help of AI applications including automatic quoting tools, chatbots, and digital advisory systems.

2. Role of Intermediaries in Complex Scenarios Persisting (Q14):

Notwithstanding these changes, the large positive difference from neutrality in Q14 suggests there are ongoing dynamics in noticing the necessity of intermediaries when handling complex or non-standard insurance needs. This means human expertise, negotiation and emotional

intelligence is still important where there is nuanced client interaction or bespoke structures around risk.

This finding brings forward a hybrid model where a human is stepping in-between, one that is based on AI for the daily and data-driven work, and then the human intermediaries concentrating on the strategic and high-touch requirement.

3. Decreasing Frequency of Interaction (Q15):

Finally the significant result for Q15 supports that implementation of AI has resulted in a decrease in the instances in which an insured has direct interaction with intermediaries. This seems to indicate that self-service capabilities and direct-to-consumer models eliminate the requirement for human mediation in normal transactions.

These results support the validity of AI adoptions that changes the intermediary and client dynamic to support both disintermediation and role evolution. The conclusions submitted stress the notion of full human replacement and underline a functional rearrangement of labor between AI and intermediaries.

Practical Implications:

Insurers should invest in the development of AI tools that can take over the routine functions effectively, thus bringing down the cost of operations and increasing accessibility.

Intermediaries should re-focus to be high-value advisors on non-routine, strategic client issues.

Training and strategic upskilling would be important to ensure that human capital is kept in line with those areas where AI has limited capacity for substitution.

Findings for RQ 3. How do customers perceive the service quality, trust, and satisfaction of AI-driven services compared to traditional human-mediated services?

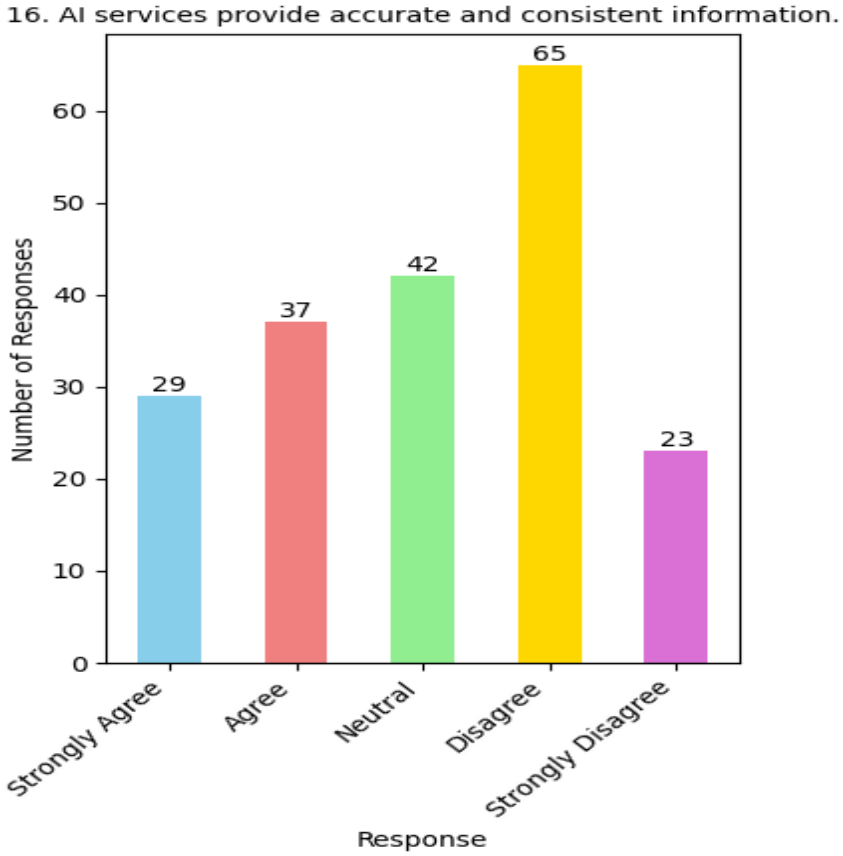

Figure 4.16
Distribution of AI services accurate and consistent information

Participants' responses to this item show a split position among respondents regarding AIs' ability to provide consistent and accurate services in the case of P&C insurance. Twenty-nine respondents responded "Strongly Agree", as did 37 respondents; eighty-eight respondents responded "Disagree", as did 65 respondents; and two respondents responded "Strongly Disagree". Also, 42 respondents chose Neutral, which signals an ambivalent, in-between or indecisive answer.

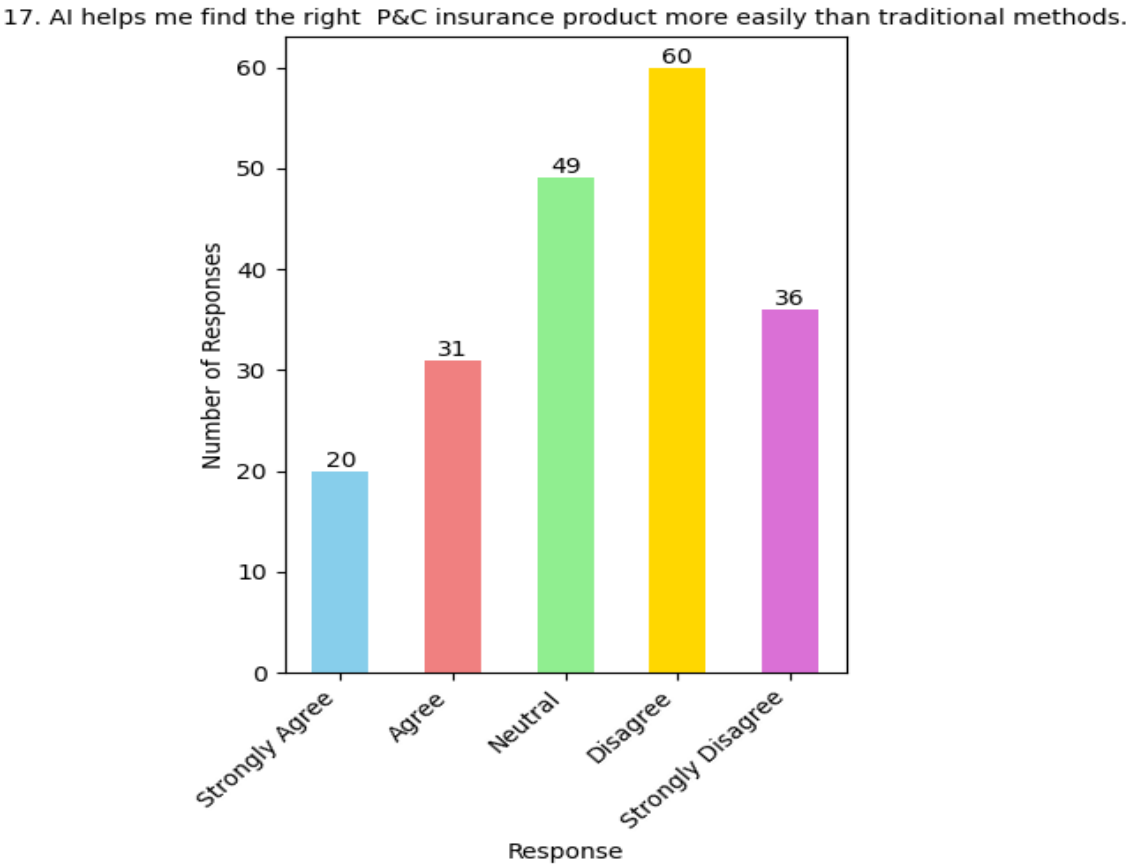

Figure 4.17
Distribution of AI helps me find the right P&C insurance product more easily than traditional methods

The responses reveal an overall skepticism when it comes to AI's capability in improving product discovery in the P&C insurance realm. A total of 51 people responded in agreement (20 "Strongly Agree" and 31 "Agree"), and a total of 96 people responded in disagreement (60 "Disagree" and 36 "Strongly Disagree"). A further 49 participants chose Neutral - Neither Agreement and Neither Disagreement.

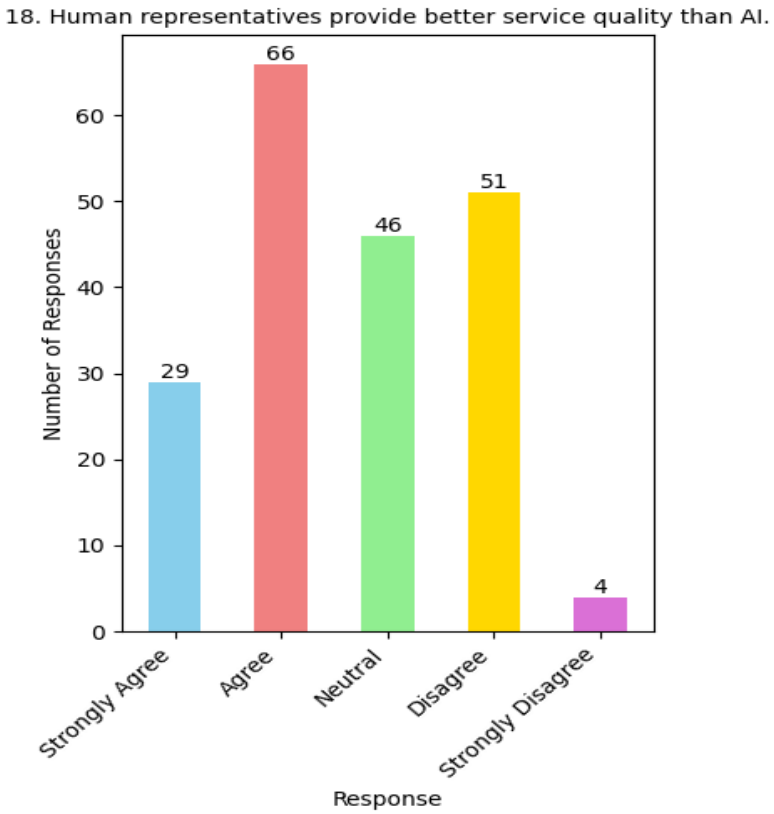

Figure 4.18
Distribution of Human representatives provide better service quality than AI

In P&C insurance, areas of human service are shown to be much preferred for delivering quality. A total of 95 respondents agrees with the statement (29 responded "Strongly Agree" or "Agree" and 66 responded "Agree"), whilst 46 chose to go for a Neutral. On the other hand, only 4 respondents strongly disagreed with it and 51 respondents disagreed with it, which means there is a clear minority against this view.

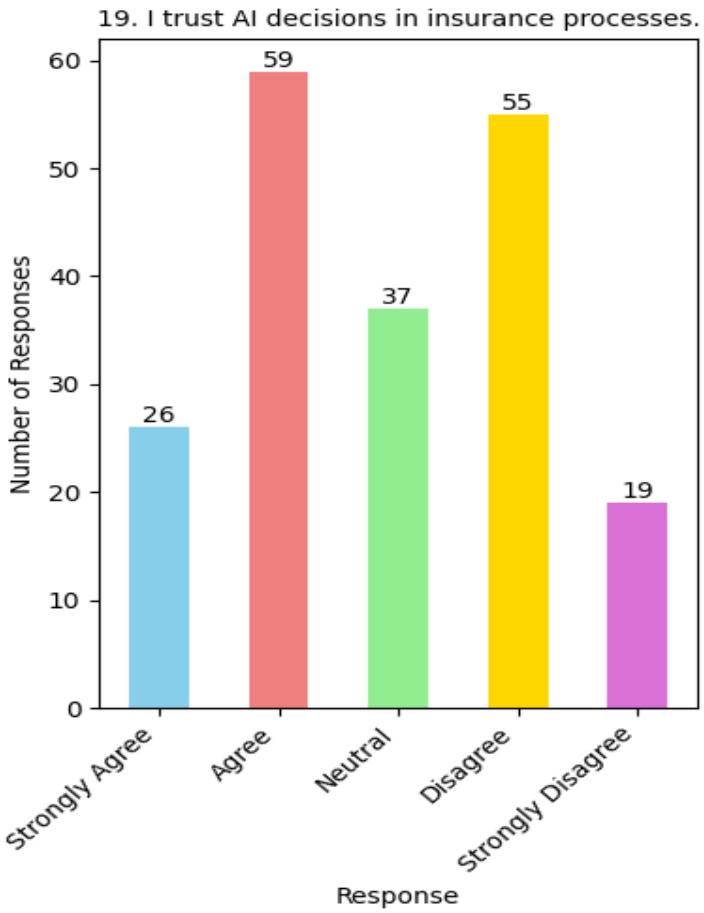

Figure 4.19
Distribution of I trust AI decisions in insurance processes

The answers to this item show a divided sentiment regarding the trust in the AI decision-making process in insurance processes. An overall of 85 respondents selected "Agree" (26 "Strongly Agree" and 59 "Agree"), while 74 people selected "Disagree" (55 "Disagree" and 19 "Strongly Disagree"). Some 37 respondents opted for Neutral.

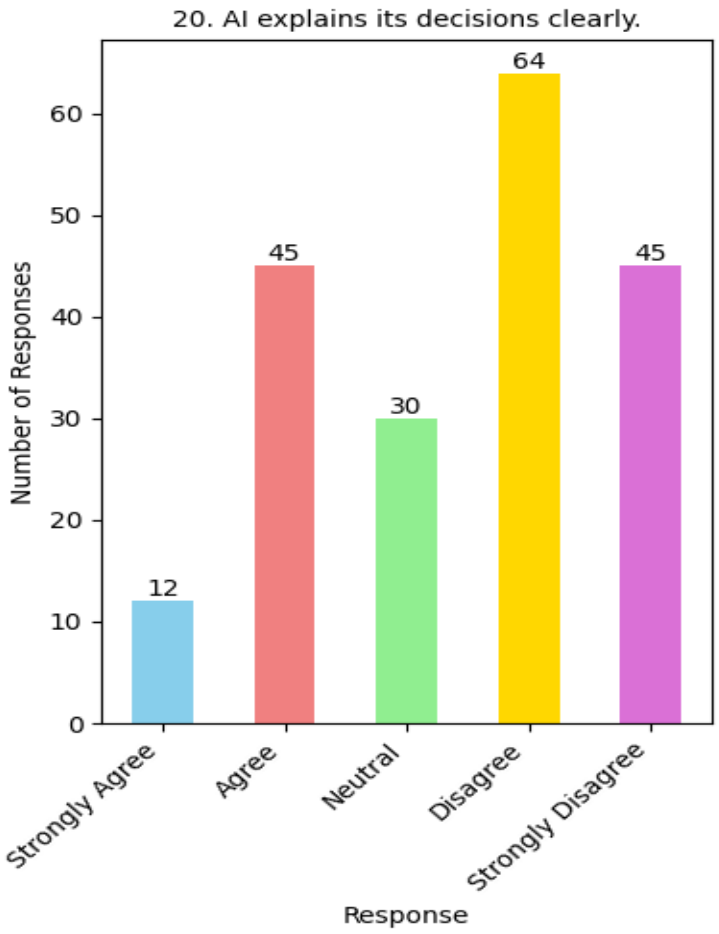

Figure 4.20
Distribution of AI explains its decisions clearly

One of the main findings was that many of the respondents did not feel that they can understand better the AI decision-making. A sum of 109 participants disagreed (64 disagreed and 45 strongly disagreed) while only 57 agreed (12 strongly agreed and 45 agreed). Also, 30 respondents were still Neutral.

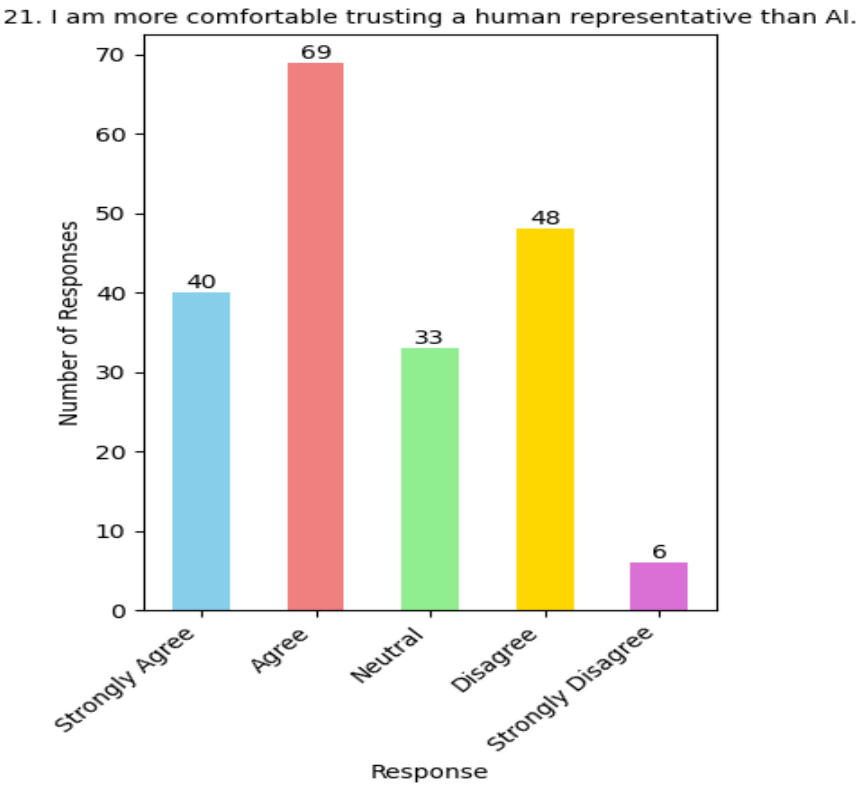

Figure 4.21
Distribution of I am more comfortable trusting a human representative than AI

Most respondents reported having more trust in human representatives than in AI. Specifically, out of the 109 respondents, 40 responded "Strongly Agree" and 69 responded "Agree", while 54 respondents responded "Disagree" and 6 responded "Strongly Disagree" while 33 respondents responded "Neutral".

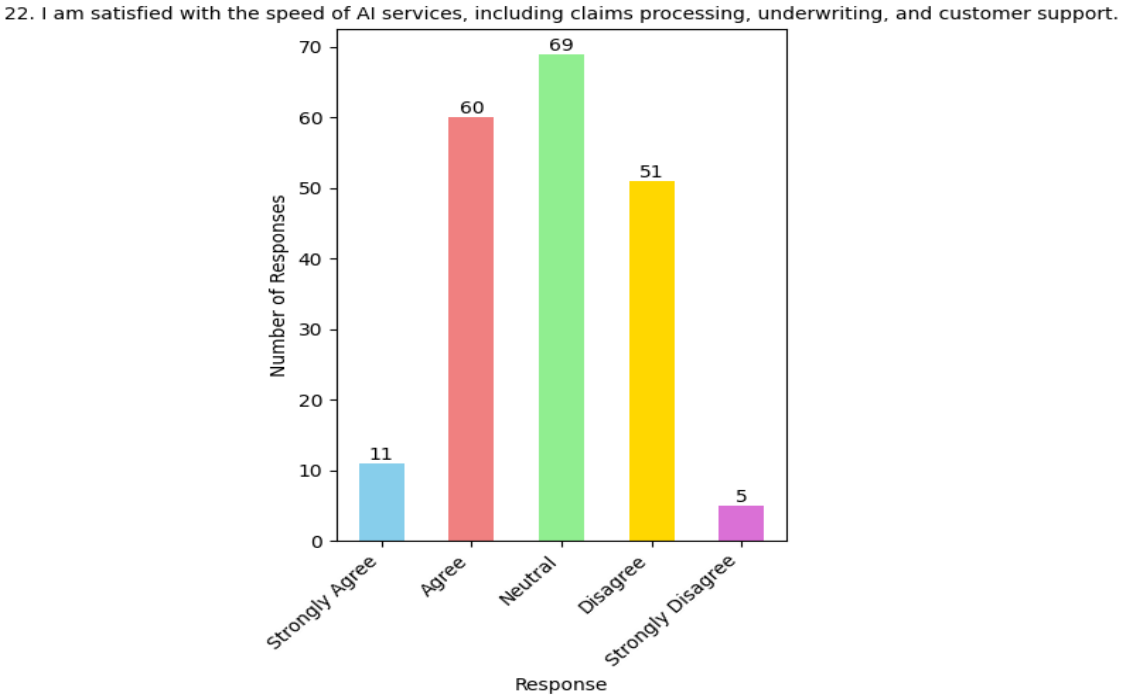

Figure 4.22
Distribution of I am satisfied with the speed of AI services, including claims processing, underwriting, and customer support

Responses concerning speed of AI service were mixed with 71 participants saying they would be pleased with this speed (11 saying "Strongly Agree" and 60 "Agree") but with a significant number of participants (56 respondents) saying that they would not be happy with this speed (51 "Disagree" and 5 "Strongly Disagree"). The largest group (69 respondents) were Neutral.

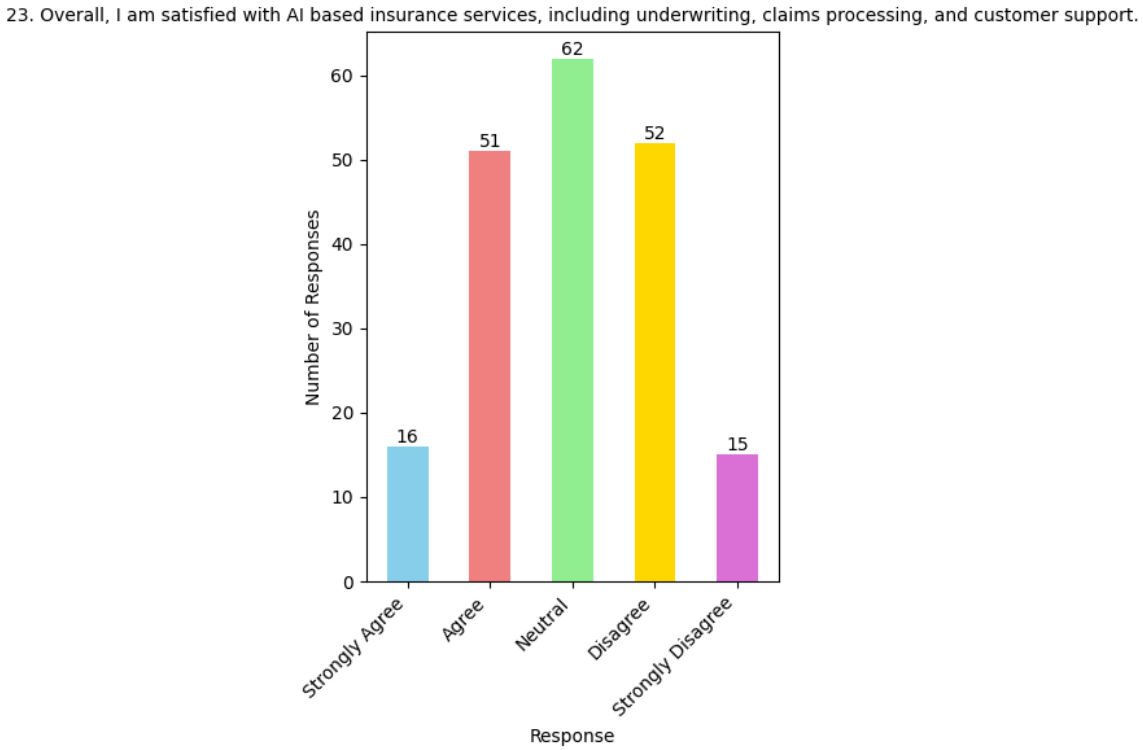

Figure 4.23
Distribution of Overall, I am satisfied with AI based insurance services , including underwriting, claims processing, and customer support

The responses are significantly spread with a near equal measure of satisfaction or dissatisfaction. 67 respondents said that they are satisfied (16 persons "Strongly Agree" and 51 persons "Agree") and almost the same number of 67 respondents showed dissatisfaction (52 persons "Disagree" and 15 persons "Strongly Disagree"). The highest number, 62 respondents, were Neutral.

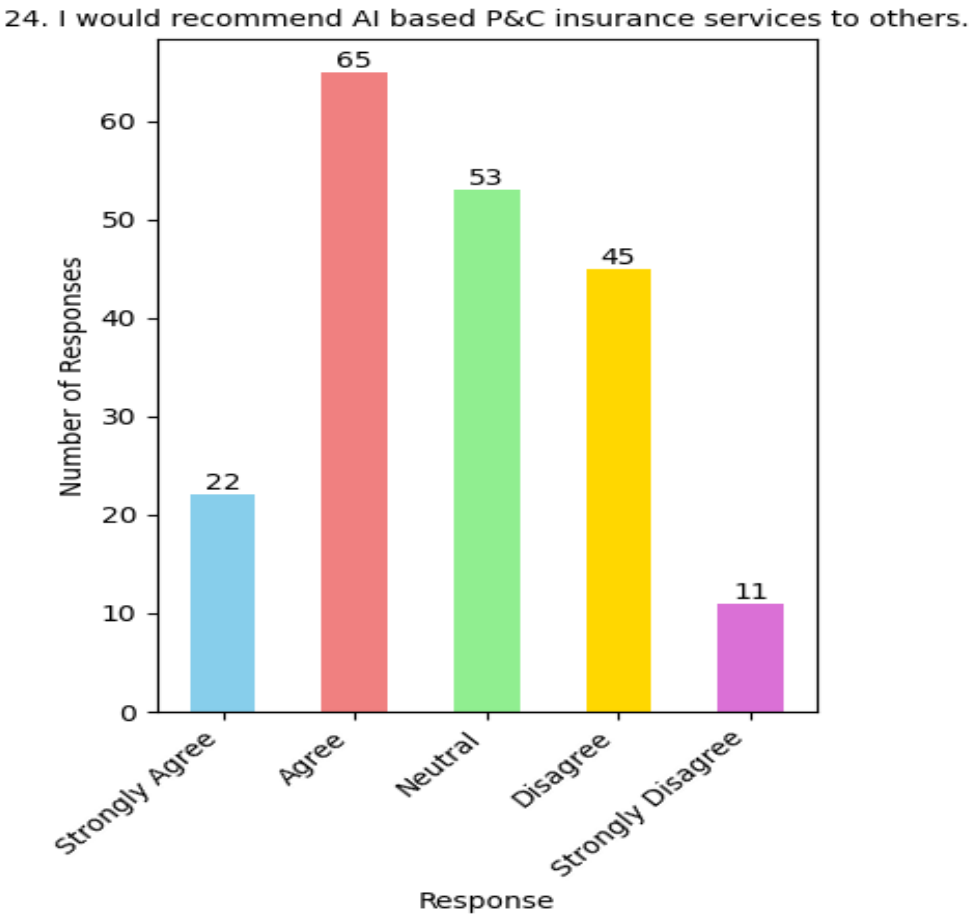

Figure 4.24
Distribution of I would recommend AI based P&C insurance services to others

The sentiment is moderate. Part of the respondents is positive (87, 22 = Strongly Agree, 65 = Agree); 53 are Neutral and 56 are resistant (35 = Disagree, and 11 = Strongly Disagree).

Summary of graphs of Section 3:

Section 3 focuses on investigating AI-related trust, communication transparency, user satisfaction from AI capabilities, and users' intention to recommend AI solutions. The results show ambivalent feelings.

On these AI-relevant questions, respondents are often more skeptical of AI accuracy, decision explanations and service quality than favorable, and disagreement is often 57% or more, compared to agreement (Q16: 65 disagree, 66 agree; Q20: 109 disagree, 57 agree). Despite all this, a large proportion of respondents still express satisfaction with the speed and general service level

of AI (Q22 & Q23) - but even here, the balances among responses are more towards the middle than for a positive agreement.

Trust is an important source of friction with many respondents saying they prefer to trust a person (Q21) rather than an AI, and they are reluctant to fully trust AI when it comes to an important decision (Q19). Nevertheless, there is cautious optimism with more than 87 respondents saying they would recommend AI-based services (Q24).

In conclusion, while satisfaction and recommendation are rising, sticking pain points related to accuracy, clarity, and trust point to the need for larger-scale adoption and developing user confidence in AI-driven insurance processes.

Test: T test:

Result

```
One-Sample T-Test Results for Sec3 (vs. Neutral Response of 3):
Variable: 16. AI services provide accurate and consistent information.
  T-statistic: -0.9083
  P-value: 0.3648
------------------------------
Variable: 17. AI helps me find the right  P&C insurance product more
easily than traditional methods.
  T-statistic: -3.5364
  P-value: 0.0005
------------------------------
Variable: 18. Human representatives provide better service quality
than AI.
  T-statistic: 4.2990
  P-value: 0.0000
------------------------------
Variable: 19. I trust AI decisions in insurance processes.
  T-statistic: 1.0501
  P-value: 0.2950
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Variable: 20. AI explains its decisions clearly.

  T-statistic: -4.8938

  P-value: 0.0000

------------------------------

Variable: 21. I am more comfortable trusting a human representative
than AI.

  T-statistic: 5.4992

  P-value: 0.0000

------------------------------

Variable: 22. I am satisfied with the speed of AI services, including
claims processing, underwriting, and customer support.

  T-statistic: 1.5937

  P-value: 0.1126

------------------------------

Variable: 23. Overall, I am satisfied with AI based insurance
services, including underwriting, claims processing, and customer
support.

  T-statistic: 0.0662

  P-value: 0.9473

------------------------------

Variable: 24. I would recommend AI based P&C insurance services to
others.

  T-statistic: 2.7445

  P-value: 0.0066
```

Interpretation:

The results provide a nuanced and granular view of customer perceptions on AI enabled insurance services:

Human Preference overrides Dimensions That Are Important:

As we know from previous research in the literature, trust and emotional intelligence still go hand in hand favoring the human intermediate (Bențe, 2021; Patil et al., 2024) so there is strong support for human service superiority (Q18, Q21).

Respondents do not believe in placing all important complex and relation-based decisions in AI.

Kakon Trust and Satisfaction with A.I. Hubble Ambiguous:

Answers to the questions Q19, Q22 and Q23 indicate no significant difference from neutrality and may reflect respondents being cautious/skeptical about AI in terms of its reliability, speed and overall value.

This is on track with the need for more work on the transparency and explainability of AI system identified in the research (Owens et al., 2022).

Communication Clarity is One of biggest Limitation:

The report's significantly negative rating for Q20 (AI's ability to explain decisions) brings up one of the huge barriers to adoption - lack of transparency.

This is logical for calls made in the proposal for "Explainable AI" standards to offer good trust and compliance regulatory to.

Positive Attitudes to Recommendation of AI:

Interestingly, respondents report that they would recommend AI enabled P&C services (Q24) resulting in potential for open mindedness towards adoption as long as functionality delivers what is expected.

The results suggest the existence of trust and communications gap in insurance services using AI that is limiting the user confidence, even if functionality (e.g., speed) may be adequate. While the respondents don't completely reject the idea of AI in insurance, they still do place a value on human engagement, especially in areas of quality, clarity and trust. This supports the contention of the proposal that hybrid models that combine the functionality of AI with oversight of humans may prove to be a more acceptable transitional state for commercial P&C clients. These findings suggest key areas of absence of trust and trust-building communication that AI developers and insurers will need to fix if they are going to accelerate a responsible rate of AI adoption. The need for user-centered AI design as well as ethical oversight tend to be obvious.

Findings for RQ4. What is the key regulatory, ethical, and data privacy concerns associated with AI adoption in P&C insurance?

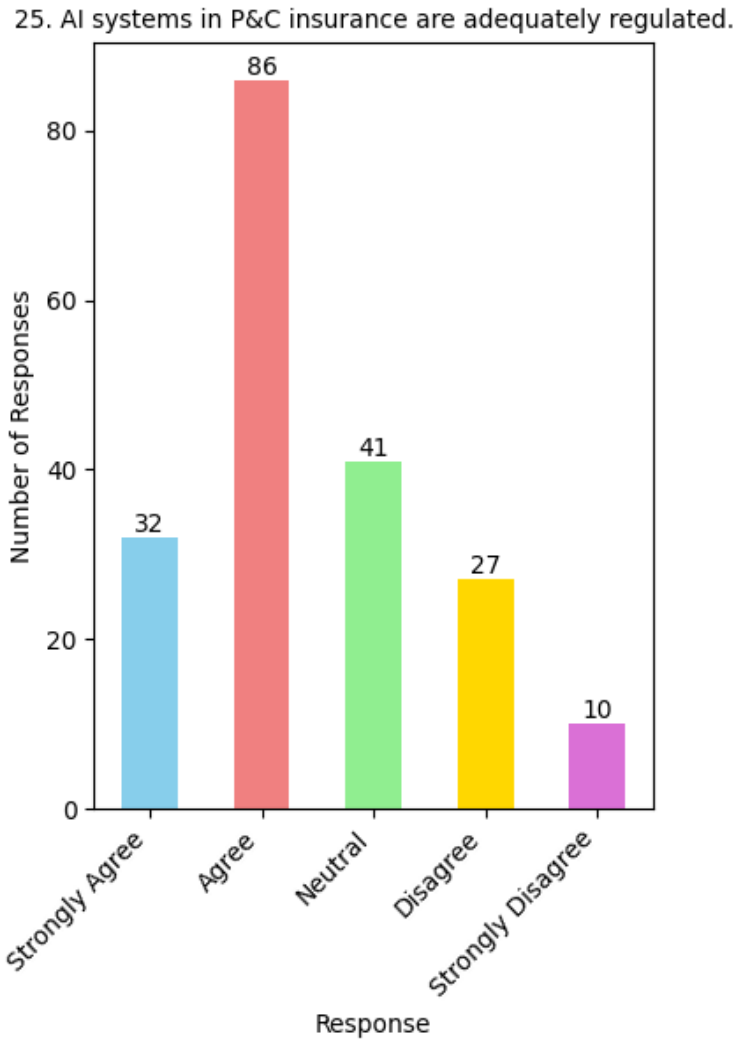

Figure 4.25
Distribution of AI systems in P&C insurance are adequately regulated

The majority agree (86) or strongly agree (32) with this idea-that AI systems in P&C insurance are regulated adequately. A moderate number are neutral (41) with fewer respondents disagreeing (27) or strongly disagreeing (10).

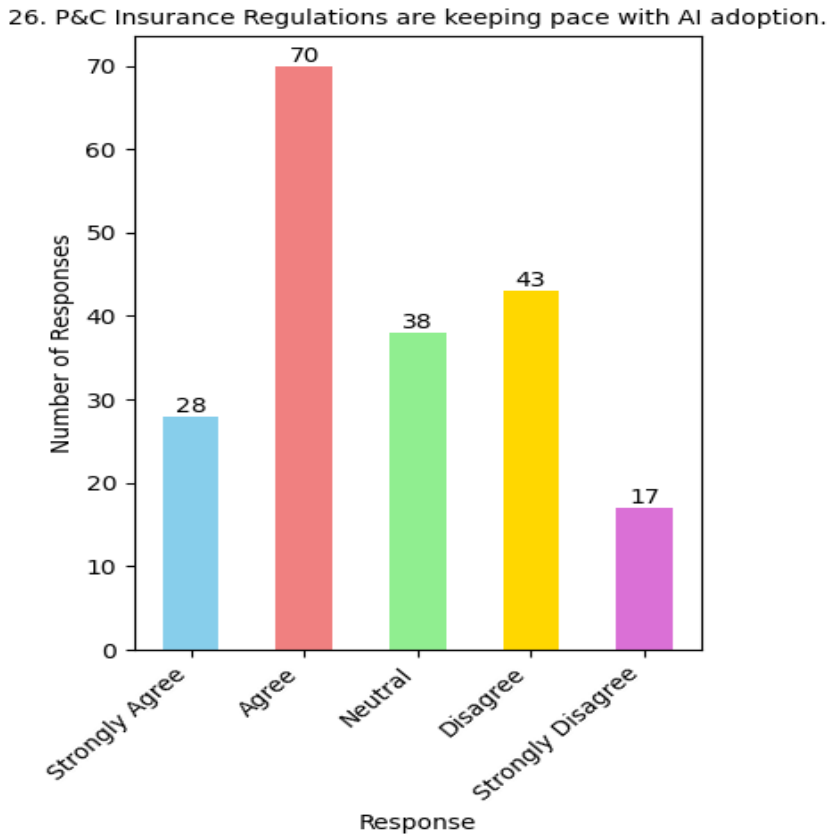

Figure 4.26
Distribution of P&C Insurance Regulations are keeping pace with AI adoption

A significant percentage of those surveyed agree (70) or strongly agree (28) that P&C insurance regulations are keeping up with the pace of AI technologies' adoption. However, there are a sizeable number of neutrals (38), and a combined number (60) disagree (43) or strongly disagree (17) with the statement.

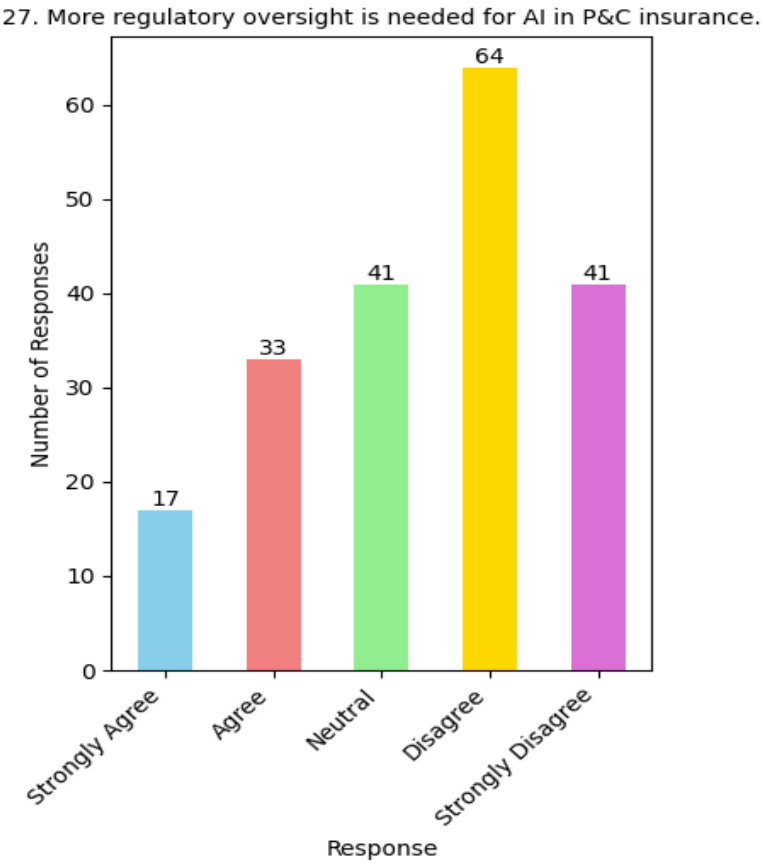

Figure 4.27
Distribution of More Regulatory oversight is needed for AI in P&C insurance

A fair number of respondents disagree (64) or strongly disagree (41) with the statement that there needs to be more regulatory oversight of AI in the P&C insurance sector. Conversely, only 33 agreed and 17 agreed strongly with the statement, whereas 41 of the respondents remained neutral.

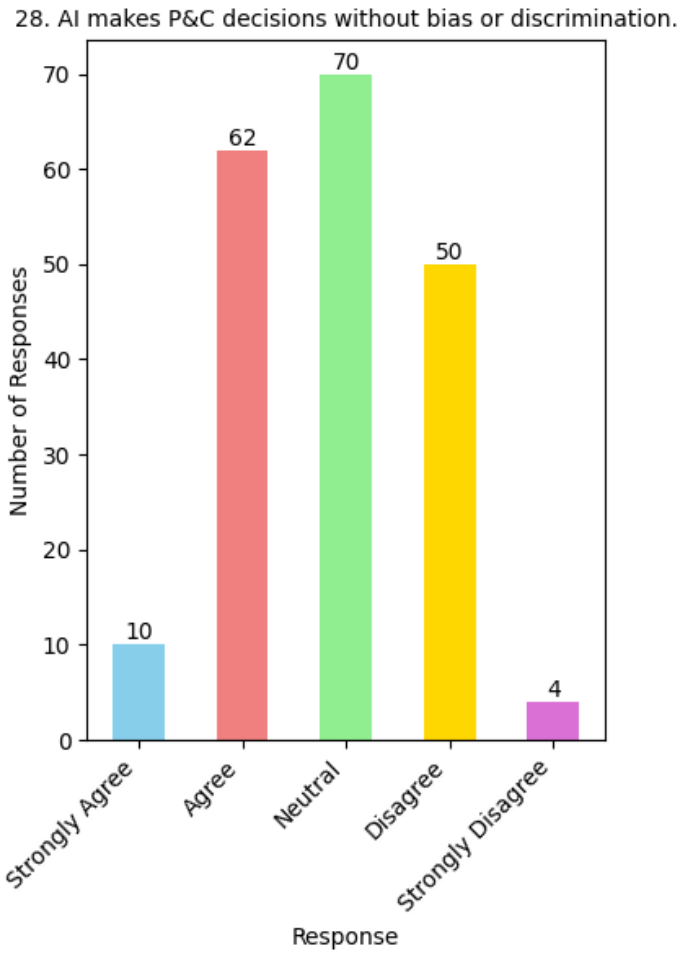

Figure 4.28
Distribution of AI makes P&C decisions without bias or discrimination

The response distribution shows that there is a moderate level of uncertainty and skepticism among the participants. While 62 respondents agreed, and 10 strongly agreed with the view that AI makes unbiased decisions, a bigger chunk were neutral towards the idea (70). Meanwhile, a quite a bit disagreed (50) and 4 strongly disagree with this statement.

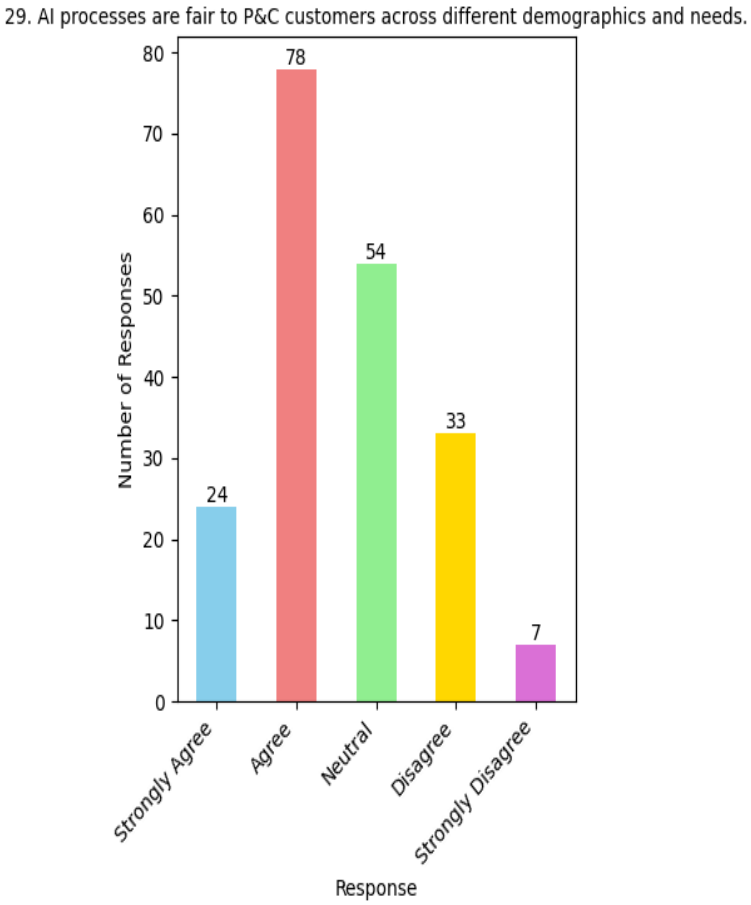

Figure 4.29
Distribution of AI processes are fair to P&C customers across different demographics and needs

A majority of respondents 78 agreeing and 24 strongly agreeing view AI processes in P&C insurance as fair regardless of customer demographics and needs. However, there were a significant proportion who chose a neutral position (54) and 33 who disagreed and 7 who strongly disagreed.

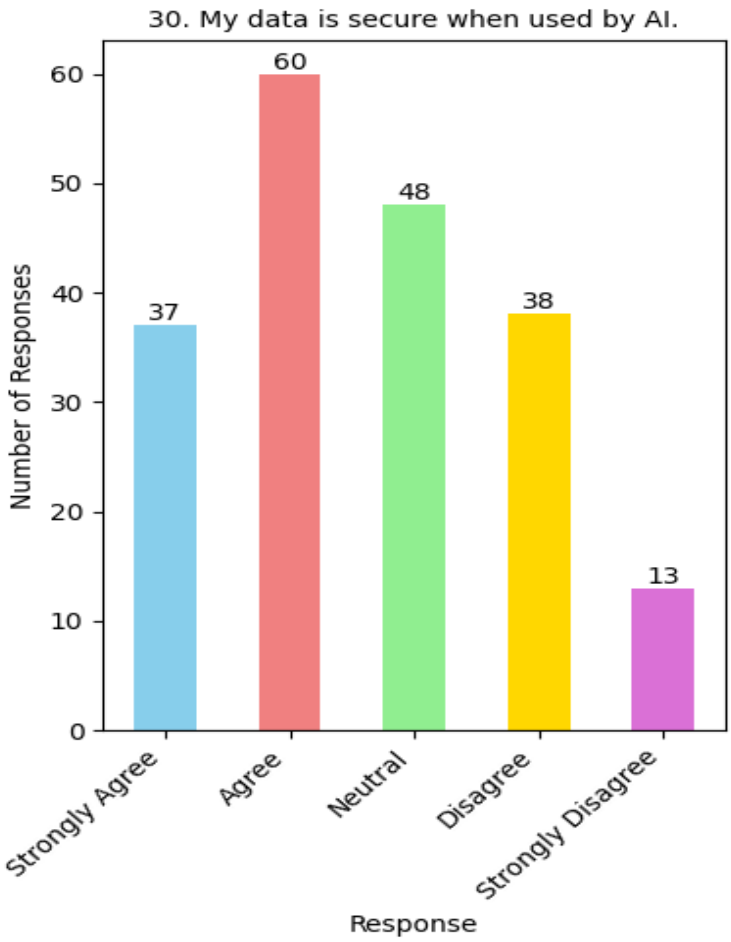

Figure 4.30
Distribution of My data is secure when used by AI

A majority number of people 60 Agreeing and 37 Strongly Agree are confident about the security of their data in the hands of AI in P&C insurance. Meanwhile, 48 respondents were of the neutral position and a combined 51 respondents (38 disagreeing, 13 strongly disagreeing) raised their concerns about data security.

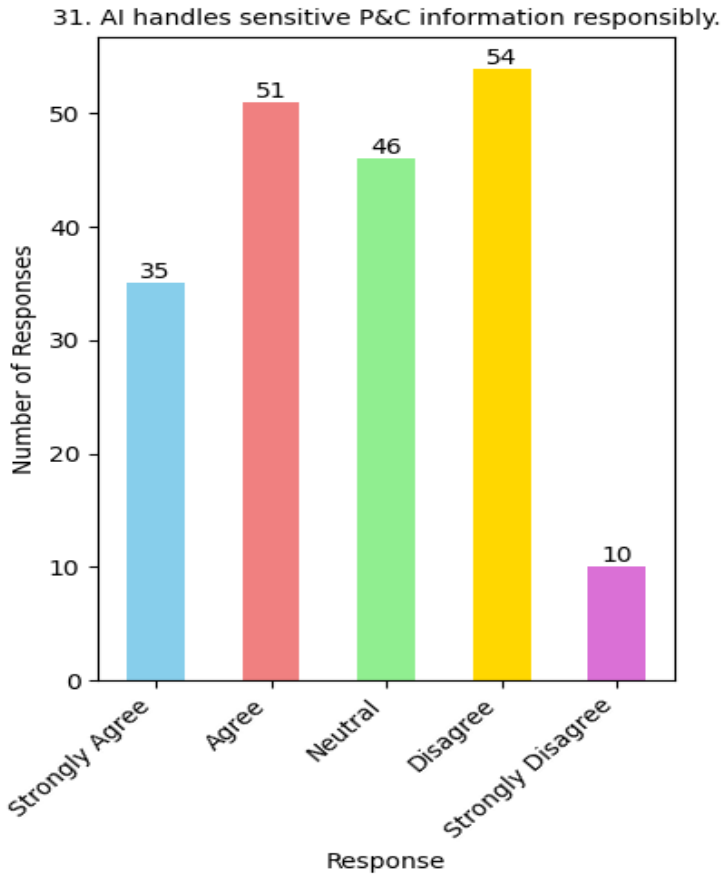

Figure 4.31
Distribution of AI handles sensitive P&C information responsibly

A total of 86 respondents (35 strongly agree and 51 agree) consider AI to be responsible in dealing with sensitive P&C information. However, respondents seemed to feel a certain degree of responsibility of AI in terms of data to 46, and between them a total of 64 respondents (54 of them disagree and 10 of them strongly disagree) indicated different levels of concern about AI's responsibility on data.

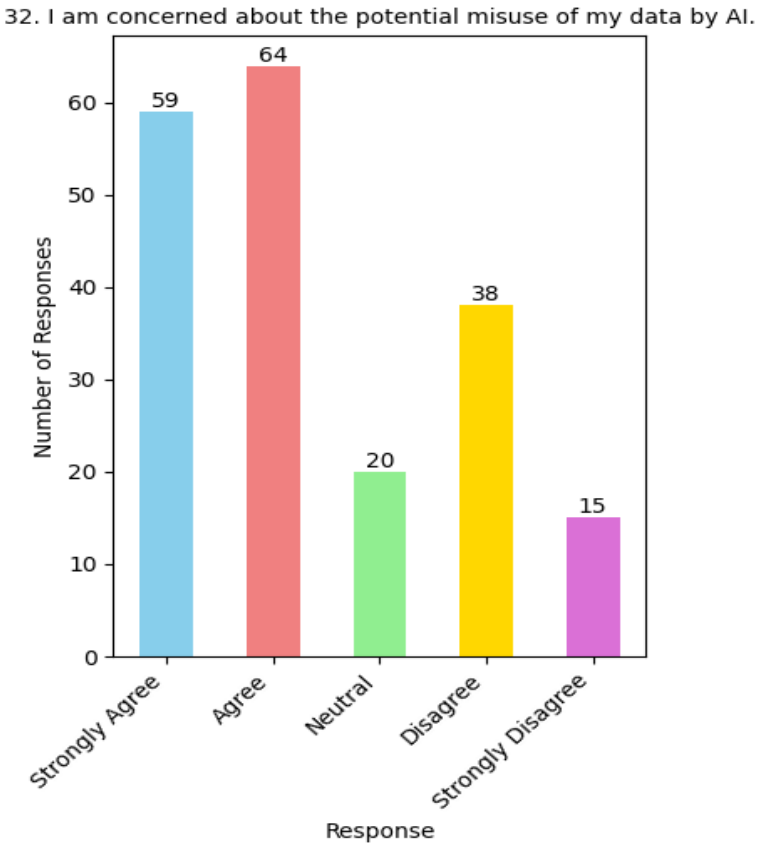

Figure 4.32
Distribution of I am concerned about the potential misuse of my data by AI

A sizeable majority of respondents 59 strongly agree and 64 agree (for a total of 123) they are concerned about the possible misuse of their data by AI systems. A combined 53 (of 38 disagree and 15 strongly disagree) expressed a lesser or no concern while only 20 decided to respond in the neutral category.

Summary of graphs of section 4:

Section 4 analyzes user perceptions on AI Governance, Regulatory Adequacy, Ethic, and Data security in P&C Insurance. A majority of respondents agree that AI systems are currently regulated (Q25) and that regulation is moving along with adoption of AI (Q26). However, the answers to Q27 demonstrate a divided opinion as to whether or not more regulatory oversight is necessary and suggest there is variety in satisfaction with existing governance structures.

Regarding ethical issues, while it is clear that many respondents feel that AI is not biased, (Q28) or fair across demographics (Q29), there is still a notable proportion of people who are neutral to the idea, and therefore an ongoing need for clear ethical guidelines. Data security perceptions show guarded optimism respondents believe their data is generally secure Q30 Responsible handling of data Q31 but there is considerable agreement in Q32 revealing great concern about possible misuse of data This duality brings to front that while users do know some of the positive aspect of AI governance, the need for transparency in AI ethics and safeguarding of user data are overriding elements.

Test: T Test

```
One-Sample T-Test Results for Sec4 (vs. Neutral Response of 3):
Variable: 25. AI systems in P&C insurance are adequately regulated.
  T-statistic: 6.8208
  P-value: 0.0000
------------------------------
Variable: 26. P&C Insurance Regulations are keeping pace with AI
adoption.
  T-statistic: 2.9169
  P-value: 0.0039
------------------------------
Variable: 27. More regulatory oversight is needed for AI in P&C
insurance.
  T-statistic: -4.5711
  P-value: 0.0000
------------------------------
Variable: 28. AI makes P&C decisions without bias or discrimination.
  T-statistic: 1.8633
  P-value: 0.0639
------------------------------
```

```
Variable: 29. AI processes are fair to P&C customers across different
demographics and needs.
  T-statistic: 5.5284
  P-value: 0.0000
------------------------------
Variable: 30. My data is secure when used by AI.
  T-statistic: 4.2258
  P-value: 0.0000
------------------------------
Variable: 31. AI handles sensitive P&C information responsibly.
  T-statistic: 2.8335
  P-value: 0.0051
------------------------------
Variable: 32. I am concerned about the potential misuse of my data by
AI.
  T-statistic: 6.2435
  P-value: 0.0000
```

Interpretation

Regulatory Compliance (Q25–Q27)

Q25 & Q26 suggest that respondents view regulatory frameworks as being mostly adequate and evolving, which shows slow but visible changes for the better in AI regulation.

However, Q27 brings forth a paradox; despite this stuff with the public perceptions of sufficiency, respondents are still in favor of extending the oversight, showing a gap of confidence that may be regulation may exist but it is not as trustworthy nor appetite accelerating as regulation that may not even make it compliant to Polices.

This is consistent with the observation of the proposal that current frameworks are not strong or well explained enough to the public or to professionals.

Ethical Issues (Q28 - Q29) Fairness and bias

Q29 displays a strong agreement that AI is fair to all kinds of customers referring to a positive perception of inclusiveness.

However, Q28 (AI is unbiased) is not statistically significant ($p = 0.0639$) which means the respondents remain undecided or skeptical about the capability of AI to make unbiased decisions.

This mixed result takes into consideration that although outputs are perceived to be fair, there is a lack of certainty on the impartiality of underlying algorithmic learning, and this very issue is one of the main ethical concerns discussed in your problem statement and in referenced sources, such as Bhattacharya et al. (2025), Filabi & Duffy (2021).

Data Privacy and Security (Q30–Q32)

Q30 and Q31 demonstrate that respondents generally believe that AI systems are trustworthy to handle data in a secure and responsible manner, which is a positive sign for technology adoption.

However, Q32 uncovers an important issue: even though participants believe there is data security in place, there is strong anxiety regarding the potential for misappropriation of their data.

This validates that perception of risk exists in the absence of technological measures that are in place due to lack of explainability, and opaque data flows.

These findings highlight:

A battle between trusting in technology and the potential need for ethical transparency

The disconnection between being functionally adequate and being emotionally confident

The role of explainability, regulation clarity and risk communication for the future of adopting AI in P&C insurance.

So in the main, regulatory structures and data handling continue towards better. but express strong desire for tighter oversight and greater transparency.

Ethical Perceptions remain Split While the outcomes are thought to be fair, the integrity of the logic of decision making used by A.I. continues to be an issue.

Despite a moderate level of trust in AI security protocols, there is substantial question over the misuse in the future which implies policy reinforcement and user education.

These findings highlight the importance of explainable AI (XAI), robust data governance and participatory regulation as proposed as potential solutions in the future in your research model.

Conclusion

The results generate strong empirical evidence that shows how the data point to essential shortcomings in regulation, difficulty in ethics (bias perception) and ongoing concerns with data misuse reinforcing the need for strategic, transparent and user-centered AI governance in the P&C insurance sector.

Test: EFA (Exploratory Factor Analysis)

Result:

Table 4.3
Factor Analysis for Regulatory, Ethical, and Data Privacy Challenges

Variable	Component 0	Component 1
AI systems in P&C insurance are adequately regulated.	0.325180	0.709755
P&C Insurance Regulations are keeping pace with AI adoption.	0.254745	0.840451
More regulatory oversight is needed for AI in P&C insurance.	-0.118783	-0.661745
AI makes P&C decisions without bias or discrimination.	0.597761	0.214977
AI processes are fair to P&C customers across different demographics and needs.	0.650890	0.121703
My data is secure when used by AI.	0.623235	0.468331
AI handles sensitive P&C information responsibly.	0.825629	0.237279
I am concerned about the potential misuse of my data by AI.	-0.551475	-0.186205

Interpretation

Factor 1: Ethics of Data and Trusting AI Behavior

High loadings: Q28, Q29, Q30, Q31, Q32

This factor is the perception of the ethics of AI, data protection, and trustfulness in the operational behavior for the respondents.

Q28-31 give an impression of confidence in AI's fairness, security and responsible behavior.

Q32 also loads negatively, which suggests that concern about misuse is inversely correlated with trust in those who trust AI more being less concerned about abuse.

Factor 2 Confidence in Regulatory Environment

High loadings: Q25, Q26, Q27

This factor is a reflection of respondent attitudes on the aspects of external oversight, governance structures, and adequacy of regulation.

Q25 and Q26 reflect the belief that regulation is satisfactory and moving in the right direction.

Q27 is reverse coded and loads negatively proving to be against perceived adequacy - those who think that oversight is adequate disagreed there should be more.

Table 4.4
EFA Description Factor Wise

Proposal Construct	EFA Factor	Description
Regulatory Compliance	Factor 2	Refers to public and professional views on whether current regulations are keeping pace with AI.
Ethical Concerns & Data Privacy	Factor 1	Captures trust in AI's fairness, bias mitigation, data protection, and responsible behavior.

Observations

Two clear perceptual dimensions exist in how respondents evaluate AI in P&C insurance:

Internal trust and fairness of AI (Factor 1)

External regulatory confidence (Factor 2)

The negative loading on Q32 ("I am concerned about misuse") shows that trust and concern are inversely related, which supports the psychological theory of risk aversion and trust asymmetry in AI use.

The EFA results provide strong empirical suggestion that respondent concerns about AI in P&C insurance naturally organize into two major themes:

Confidence in regulatory oversight

Trust in AI's fairness and data ethics

Summary of tests:

The analysis of the fourth of these research objectives shows two different, but interrelated dimensions, which determine stakeholder's perception of AI in the P&C insurance sector: Regulatory confidence and ethical trust in AI behavior. Descriptive and inferential results find that despite the overall perception of regulatory frameworks as evolving and adequate (Q 25-26), there is a significant paradox that many, in particular, call for stronger oversight (Q27) which appears to point the lack of confidence in regulatory frameworks in-between formal adequate and perceived enforceable. Ethical considerations add more spots for confusion to perceptions. Although output from AI is widely perceived to be between diverse groups (Q29), there is still a skepticism towards the issue of algorithmic impartiality (Q28) suggesting the issue of ethical basis behind AI is not actually being established yet. Data privacy and security perceptions also reveal a similar pattern in that despite peoples feeling confident in the management of their data in general (Q30-Q31) there is a significant distrust of misuse of data (Q32) which indicates an imbalance in peoples risk psychologies. These findings are supported further by results gathered from exploratory factor analysis (EFA) which reveals two latent factors, namely Factor 1: trust in fairness and ethical data practices of AI, and Factor 2: confidence in regulatory oversight. The inverse loading of Q32 within Factor 1 brings out a necessary tension - higher trust in AI is correlated to less fear of misuse which is coherent with behavioral theories of risk aversion. Together, these insights provide a great deal of empirical evidence for the popularized need for explainable AI (XAI) propositions, better data governance, and participatory frameworks for

regulation included in the proposal. They affirm that firm adoption of AI in insurance need to move beyond the technical level in meeting the emotional, ethical and regulatory expectations through transparency, accountability and trust-building mechanisms.

Conclusion for quantitative analysis:

Overall research proves that there is very much a significant influence of AI familiarity on perceptions of operational effectiveness in the commercial P&C insurance sector. The results of regression and analysis of variance (ANOVA) highlight the noteworthy finding of the fact that the stakeholders that are more knowledge in the field of AI are reporting the significant better perception on the improvements in abolishing underwriting speed and accuracy, claims SD processing efficiency, and service responsiveness. Of particular interest is the fact claims management is seen as the area where AI is most positively viewed especially in terms of reduction of processing errors and improved turnout times.

In terms of distributional impacts, the data holds up a partial disintermediation trend, where AI tools are coming thereafter to take over functions once ruled by brokers and agents. However, this is shifting not, in absolute human intermediaries are still very appreciated performances, complex and judgment-intensive situations for insurance products to back hybrid model of AI Human coexistence. T-tests prove that although reliance on intermediaries has gone down, they have maintained their strategic relevance, particularly in high stakes and bespoke engagements.

Customer perceptions of AI enabled customer services paint a much more complex picture. While it is true that many respondents hold a cautiously optimistic point of view, there are still sizeable rows of concern floating around issues like trust, transparency and the quality of AI-driven decision and service delivery. Despite some willing to recommend AI based services, respondents often showed a preference for human representatives in term of their felt empathy, quality and clarity of their decisions. This would serve to suggest that although functionality is recognized, in terms of customer trust and satisfaction, AI still has obstacles in the aspects of emotional intelligence and explainability.

Finally, the collision of regulatory, ethical and data privacy issues reveals a divided perception between the general attitude of respondents inclined towards the adequacy of existing regulatory safeguards and data security measures on the one hand, and the heavy concern for potential misuse of data and call for more transparency on the other. Exploratory factor analysis (EFA) used to further support the bifurcated structuring of perceptions around trust and ethics on the one side and regulatory confidence with an important theme of explainable AI, robust data governance and participatory regulation on the other.

In conclusion, the results of data analysis has confirmed the conceptual framework of the research and it is clear that even though AI adoption in P&C insurance are widely perceived to be beneficial, the transformative potential of AI is mediated by the relatively high variability of user familiarity, context specific complexity and enduring challenges of trust and governance. To implement good, ethical and inclusive AI integration, insurers need to focus on education of stakeholders, introducing transparency to AI system and providing oversight by people as required.

Qualitative Analysis

The qualitative content analysis in this study offers a nuanced understanding of how Artificial Intelligence (AI) is changing the Commercial Property and Casualty (P&C) insurance sector, especially in terms of operational functions, dependence on traditional intermediaries, customer perceptions, and regulation and ethical considerations. The results show a consistent theme across academic and corporate sources that AI has been shown to have increased operational efficiency, accuracy, and speed in underwriting, claims processing and customer service. However, as AI is becoming an enabler of process automation through routine functions, it is renegotiating the function of the human intermediaries and transforming them from transaction support to more strategic, advisory roles. Customer Perceptions Despite acknowledging the efficiency and responsiveness of AI, customer perceptions raise issues of lost empathy, trust and transparency in AI driven interactions. Additionally, there is a large gap in the regulation currently in place, and the rapid adoption of AI has not seen the development of proper governance, raising

ethical and data privacy issues. The content analysis therefore underlies the idea of an evolving nature of AI in the insurance industry, which requires a balance between human intelligence and AI capabilities to ensure that innovation does not undermine integrity and customer trust.

Findings for RQ1: To measure the extent of AI adoption has transformed operational functions, including underwriting, claims processing and customer service.

Literature Insights

According to existing literature, AI have made improvements in operational performances within insurance organizations. As per the study accomplished by Kondeti (2025) and Joshi (2025) showcase that automation and ML tools makes underwriting and claim assessment streamlined keeping redundancy medium and increasing accuracy in decision making. The recent literature by Aragani (2024) and Reddy (2024) shows in their research that ability of predictive analytics to make claim settlements faster increases the fraud detection rates and thereby reducing manual processing time. On a collective note, this study offers argument that AI introduces systematic improvements in both speed and precision of insurance operations enabling more effective data utilization, pattern recognition and decision support. As per the scholars, cost savings are not the only benefits of efficiency. Automation liberates human underwriters and claims assessors by eliminating the time-consuming internal administrative work and enables them to focus on the strategic and customer-focused work. Nevertheless, even with such developments, most of the researchers warn that the results of AI rely on the quality of the input data, and the ability of current systems to integrate the results. Consequently, the literature considers AI to be a complement, as opposed to a substitute of professional expertise.

Corporate Reports Evidence

The corporate based documentation changes the academic view of AI as a transformative efficiency driver. As per report presented by Deloitte (2024), automation and robotic process automation technologies will control average claim processing time by 60 percent within digital

adopters. On the other hand, Allianz Group (2024) represented that ML integration will reduce manual data entry errors by 70% thereby making improvements in operational reliability. AXA Group (2024) in their report found that improvements in operational reliability occurs by having strong precision over fraud detection. These results are also similar with report from McKinsey & Company (2024), which described that automation works as a catalyst for relocation of human capacity through higher value activities such as complex underwriting and customer consultation. The corporate data and scholarly evidence are consistent and suggest that maturity of AI ecosystem is required within insurance domain. The firms are shifting from pilot projects to a solid embedded enterprise wide application. However, the reports also found transitional challenges that should be worked upon such as legacy-system compatibility, data-security constraints, and workforce reskilling needs.

Findings for RO2: To assess the remaining degree of reliance on traditional intermediaries (e.g., brokers and agents) before and after the implementation of AI based solutions.

Literature Insights

According to the academic literature, the role of intermediaries including agents and brokers has changed dramatically due to the adoption of AI. According to Rehman (2024) and Dabbugudi (2022), automation has been used to carry out most of transactional functions, such as policy quotations and routine claims submissions. Mazure and Mazure (2023) explored this as human to digital mediation, whereas Benze (2021) emphasizes that human judgment is still essential when it comes to a non-standard or complicated underwriting scenario. To conclude, these papers describe disintermediation as not abolishment but rather redefinition: the everyday intermediation is on the way down, but interpretive and advisory functions remain.

Corporate Reports Evidence

According to the industry evidence, a theoretical perspective could be seen occurring within the analysis. As per reports published by PwC (2023), intermediary commissions have 25

percent reduction among digital first insurers due to growing dominance of self-service and AI based sales platforms. Whereas, McKinsey & Company (2024) in their published work state that policies in emerging Insurance technology firms are worked through automated channels around 80 percent. They are now dependent on automated channels making it more strategic and systematic on policy reformation and developments. Furthermore, the OECD (2021) state that human intermediaries remain indispensable in compliance-intensive contexts. On a similar note, Geneva Association (2023) accomplished regulatory commentary which put emphasis on complete automation considering it neither feasible nor desirable in advisory and fiduciary roles. Thus, a neutral perspective for complete automation could be seen in the insurance technology industry.

Findings for RO3: To analyze customer perceptions of quality, trust, compliance and satisfaction in AI enabled versus traditional human intermediated insurance transactions.

Literature Insights

Customers attitude towards AI-based service provision in the insurances industry is complex. According to Patil, Rao, and Sharma (2024), AI application in insurance activities has also had a high level of access to the service, simplified the claim process, and shortened turnaround times, all of which directly impact the apparent functional quality. The customers are getting more and more attached to AI-powered services as something efficient, consistent, and 24/7 responsive, which is not something that traditional human-operated models can achieve. Nevertheless, as Benutc (2021) notes, there is an unintentional emotional deficit that is caused by the efficiency-driven appeal of AI. Customers usually complain about loss of empathy, individualization and humanness when they deal with chatbots or virtual assistants. Even in such cases as claims settlement, where a sense of fairness and emotional reassurance are paramount, AI interfaces can have a negative impact on affective interaction and create a feeling of lack of connection with the insurer. Mbaha (2024) and Folches (2021) proceed with advancing the

discussion by stating that the trust in AI-mediated insurance relationships not only depends on performance but also on the perceived integrity of ethics. The concept of algorithmic transparency, data privacy, and fairness are some of the issues that have a significant impact on the readiness of the customers to use automated systems.

Corporate Reports Evidence

These findings are supported by corporate and consultancy studies. According to McKinsey & Company (2024), customer satisfaction is at its highest point when AI is used to supplement, but not to substitute human representatives. As EY (2023) showed, the mixes of automation and human control of services were rated highest in terms of trust all over the world. Lemonade Inc. (2023) noted that although automated claim handling was an effective method of increasing efficiency, when human-assistance was removed, repeat-purchase intentions decreased. Allianz (2024) and AXA (2024) also report that perceived fairness is increased when there is transparency concerning the algorithmic decisions.

Findings for RO4: To identify the challenges and limitations of regulatory compliance, ethical concerns and data privacy

Literature Insights

Ethical and regulatory aspects of AI in insurance are becoming an increasing academic concern. Mbaha (2024) emphasizes that the regulatory systems are still under the technological advancement, and there are gaps in accountability. According to Cath (2018), algorithmic opacity highlights the problem of the conventional governance models that take into consideration the accountability of a human decision. Zetzsche et al. (2020) believe that the traditional financial-regulation strategies cannot be used to control self-learning algorithms, and Krafft et al. (2020) suggest collaborative governance based on statutory and industry mechanisms. The literature in general points at the necessity of clear algorithms, mitigation of bias, and strong data-protection policies to maintain confidence of the population.

Corporate Reports Evidence

Corporate reports and policy confirm that the mechanisms of governance are still developing. The OECD (2021) demanded the cross-border harmonization of AI and data-ethics principles. The study by EIOPA (2023) revealed a wide range of differences in the governance mechanisms used by insurers to handle AI risk, which could denote an uneven preparation in European markets. The corporate responses are an attempt to bridge this gap by self-regulation. Allianz (2024) and AXA (2024) both came up with boards and committees of AI-ethics and data-governance to oversee the fairness and compliance of the model. Geneva Association (2023) noted also that the self-regulation would be a provisional step to be taken until more extensive policy frameworks would appear.

Synthesis of the Findings

All the four research questions provide insight into the fact that adoption of AI has brought about deep but unequal changes in the operational, structural, perceptual, and normative levels of the P&C insurance business. Operationally, there is both empirical and documentary evidence of quantifiable efficiency improvements. The turnaround times and human error are minimized with the help of automation and predictive analytics, which proves the idea that AI can help to increase the accuracy of results and resource use. However, full automation is not possible or desirable, and merely requires human validation to ensure that quality control is also achieved.

There is disintermediation of the structural dimension, which relates to the middle positions. Routine jobs are assigned to algorithms, whereas complex advisory services remain. This change has transformed the career paths of insurance with the intermediaries shifting towards consultant and compliance roles. The perceptual dimension indicates that the attitude of the customers is ambivalent. Clients will enjoy quicker service and constant access but still distrust privacy of their data and algorithm bias. Companies that embrace the transparent and hybrid models have a greater satisfaction rate, which explains the need of coexistence of technology and empathy to maintain trust.

The normative aspect, which is concerned with regulation and ethics, has the most significant divide between innovation and control. Lack of harmonized governance structures warrants ethics initiatives that are industry-driven. Even though such efforts are worthwhile, the ultimate legitimacy will rely on written standards and collaboration on an international scale. Combined, the cross-comparative synthesis suggests that there is a twofold direction of technology acceleration and institutional measured response to AI integration in insurance. The gains in efficiency are vast, but the social and ethical system needed to stabilize such new developments is yet to be established. The future of AI in P&C insurance will then be dependent on balancing between automation and accountability.

Table 4.5
Content Analysis Findings

Research Question (RQ)	Themes / Key Findings	Type of Document	Source	Quoted Content Analysis Findings and Interpretation
RQ1: To what extent has AI improved efficient use of resources, accuracy in processes, and speed in underwriting, claims, and customer service?	Operational Efficiency	Academic	Kondeti (2025)	"AI-driven automation in underwriting workflows has reduced manual workload and enabled predictive decision-making with 35–40% greater speed." Efficiency benefits are evident in data-intensive underwriting and claims operations.
	Accuracy and Predictive Analytics	Academic	Aragani (2024)	"Predictive models enabled insurers to assess claim risks more accurately, achieving over 90% accuracy in fraud detection." This reinforces quantitative findings from the survey.
	Speed and Automation Impact	Corporate	Deloitte (2024)	"AI-enabled claims processing reduced average turnaround time by 40–60% among leading P&C insurers." (p. 12). This quantitative measure supports efficiency perceptions expressed by survey respondents.

	Operational Integration and Error Reduction	Corporate	Allianz Group (2024)	"Machine learning models lowered manual data entry errors by nearly 70%, improving operational precision." The result mirrors the improvement themes in respondent feedback.
RQ2: How has reliance on traditional intermediaries changed since the implementation of AI solutions?	Disintermediation of Brokers	Academic	Rehman (2024)	"AI interfaces now handle tasks previously dependent on brokers, such as initial quoting and eligibility checks." This indicates declining intermediary roles in transactional services.
	Evolution to Advisory Roles	Corporate	PwC (2023)	"Brokers are evolving from transactional processors to trusted advisors in a digital-first ecosystem" (p. 19). This aligns with respondents' views that human expertise remains vital for complex risk cases.
	Shift to Direct-to-Consumer Channels	Corporate	McKinsey & Company (2024)	"70–80% of new policies in InsurTechs are completed through AI platforms with minimal human contact." This validates respondents' recognition of structural shifts toward digital mediation.
	Regulatory Perspective on Human Oversight	Regulatory	OECD (2021)	"In complex P&C underwriting, human intermediaries continue to provide indispensable interpretive and compliance support." Thus, disintermediation remains partial, not total.
RQ3: How do customer perceptions of service quality, trust, and satisfaction differ between AI and human-provided services?	Service Convenience and Responsiveness	Academic	Patil et al. (2024)	"Customers praised AI-based claims systems for faster resolution and 24/7 availability but indicated a lack of empathy compared to human agents." This mirrors survey themes of efficiency but limited emotional connection.
	Trust and Ethical Concerns	Academic	Mbah (2024)	"Customers' trust in AI depends largely on algorithmic transparency and data protection assurances." Ethical governance

				appears as a precondition for customer acceptance.
	Satisfaction in Hybrid Models	Corporate	EY (2023)	"Customers report highest satisfaction levels (82%) in hybrid service models combining AI automation with human interaction." The finding corroborates respondents' preference for balanced service delivery.
	Transparency and Brand Trust	Corporate	Lemonade Inc. (2023)	"Our AI Jim handles claims in seconds; transparency is key to maintaining user trust." (p. 4). Respondents similarly cited transparency as a central driver of confidence.
RQ4: What are the key regulatory, ethical, and data privacy concerns regarding AI in P&C insurance?	Regulatory Lag and Governance Gaps	Academic	Zetzsche et al. (2020)	"Regulation has yet to fully catch up with the algorithmic complexity and opacity of AI systems in financial services." (p. 8). The statement underscores systemic regulatory inertia.
	Ethical Oversight Practices	Corporate	AXA Group (2024)	"AXA's internal AI ethics board ensures algorithmic fairness and transparency across claims and pricing systems." This self-regulatory approach substitutes for formal legal frameworks.
	Data Privacy and Accountability	Regulatory	EIOPA (2023)	"Insurers' governance mechanisms for AI risk remain inconsistent across jurisdictions." (p. 5). This finding aligns with survey sentiments calling for stronger oversight.
	Need for International Standards	Regulatory	OECD (2021)	"Cross-border harmonization of AI ethics and data policies is essential to sustain public trust in automated insurance decisions." The statement echoes respondents' requests for unified data-protection norms.

Conclusion

The content analysis shows that AI is a radically but evolutionary power in the P&C insurance industry. It improves the rate of operation, accuracy, and resource efficiency, which is aligned with most of the digital-transformation goals of the global insurers. Meanwhile, it changes the intermediation pattern, delegating routine operations to automated systems and resettling human skills in the areas of interpretation, risk consultation and customer sympathy. On the customer side, AI has a better functionality but cannot match the feeling of being reassured with human interaction. Lastly, regulatory wise, AI innovation is far ahead of the development of consistent regulation frameworks, which forces companies to seek internal ethical governance as a transitory measure. The information presented by the primary and secondary findings taken collectively proves that AI is an augmentative, but not substitutive intelligence. Its performance relies on a symbiotic association between human intelligence and computing accuracy. Further development of AI in P&C insurance will thus depend not only on the organizational readiness to make investments in data infrastructure and analytics but also in ethical design, transparent communication, and reskilling of the workforce. The sustainability of AI-driven insurance will be based in the long term on whether the industry will balance innovation with integrity, effectiveness with empathy and automation with accountability.

4.3 Summary

Operational Efficiency: Enhancing the efficiency of the financial markets:

AI has made huge advances in underwriting, claims processing and customer service speed and efficiency. Respondents overwhelmingly agreed that AI has sped up the underwriting process and claims processing and errors have been reduced and response times accelerated.

Mixed Perceptions with regards to Accuracy and Trust :

While AI has increased the accuracy of claims processing, there was a split of opinion on its effect on the accuracy of underwriting, suggesting that there is a degree of skepticism. Many

respondents were equal or disagreeable that AI has the potential to completely replace human judgment in underwriting.

Trust of decisions made by AI was also divided with a large proportion of respondents preferring human representatives over AI due to clarity and human empathy support.

Disintermediation and the Evolution of Roles:

The survey found that people's dependence on traditional intermediaries, such as brokers and agents, has fallen as AI tools have been increasingly used. However, caught in between, respondents recognized that intermediaries still play a critical role in complex, non-standard scenarios and are still important for advisory and compliance roles.

Customer Perceptions of AI:

Customers appreciate AI for its speed, 24/7 availability and operational efficiency, but fear a lack of empathy and transparency. While AI services are efficient, respondents often chose to work with human representatives when it came to service quality and clarity when decisions were made.

Despite some skepticism, a large number of respondents indicated that they were prepared to advocate for AI-driven services if the functionality is improved in some way.

Challenges: Regulatory and Ethical Issues:

While AI is regarded as an indispensable tool in improving operations, there is much concern about the sufficiency of existing regulatory frameworks. Many of the respondents emphasized the importance of greater oversight and transparency in the AI decision making process.

Ethical issues, such as data privacy, algorithmic bias, and fairness, were prominent issues. Respondents expressed doubt in the impartiality of AI and also feared ways in which data can be misused, hence also raising the necessity for better data protection policies.

CHAPTER V:
DISCUSSION

5.1 Introduction

This chapter discusses and interprets the key findings presented in Chapter IV: we are focusing on the transformation of Artificial Intelligence (AI) and its impact on the Commercial Property and Casualty (P&C) Insurance Industry. The discussion highlights the presence as well as the practical meaning of these results and explains what they mean for insurance companies, intermediaries, customers and regulators.

The results of both the quantitative survey and qualitative content analysis reveal that the efficiency, accuracy and speed in underwriting, claims processing and customer service have improved significantly due to the use of AI. However, there is still a limit to the level of automation, with human expertise still being pivotal to the ability to assist in complexity and of high-value cases.

The results also show that AI is changing, but not replacing traditional intermediaries like brokers and agents. Routine, data-driven tasks are being automated and intermediaries are moving towards advisory and relationship based positions. From the customer perspective, AI increases accessibility and responsiveness of service, but can't offer the same empathy and trust as human interaction.

Finally, the study addresses some of the increasing regulatory and ethical challenges on issues of transparency, data privacy, and algorithmic fairness. While insurers are taking steps towards internal governance to control such risks, there needs to be more stringent external oversight and countries need synchronized regulations.

5.2 Discussion of findings

In this chapter, we will present a detailed discussion of the findings related to each of the four research questions (RQs) that guided this study. The discussion will be divided into two sections for each research question: one focusing on the quantitative analysis and the other on the qualitative analysis.

For RQ1 ("To what extent has AI improved the efficiency, accuracy, and speed of core insurance processes such as underwriting, claims processing, and customer service?"), the discussion will first consider the quantitative analysis as it covers the survey responses on the impact that AI has on operational efficiency, speed and accuracy. This will be followed by the qualitative analysis which will look further into the secondary sources of data such as academic literature and corporate reports to provide further insights.

For RQ2 ("How has the reliance on traditional intermediaries in the P&C insurance sector changed since the implementation of AI solutions?"), we will start with the quantitative findings, i.e., how the survey data reflects changes in the role of traditional intermediaries as a result of the adoption of AI. The qualitative discussion will then build on these findings by exploring how industry reports as well as academic research on the shift from traditional mediation to AI-based systems are framed.

For RQ3 ("How do customers perceive the service quality, trust and satisfaction of AI-driven services compared to traditional human mediated services?"), the quantitative analysis will be done on customer perceptions in the survey data, specifically how they trust, are satisfied and experienced AI driven services. The qualitative analysis will be further carried out on customer perspectives by referring to academic works and corporate reports that pertain to trust and satisfaction in insurance services using AI.

For RQ4 ("What are the key regulatory, ethical, and data privacy concerns associated with AI adoption in P&C insurance?"), the discussion will focus on the quantitative results concerning regulatory, ethical, and data privacy issues, which were raised by the survey respondents. This will

be followed by a qualitative analysis which explores the regulatory frameworks, ethical issues and data privacy issues discussed in academic literature and corporate reports.

Discussion of Findings for RQ1: To what extent has AI increased the efficiency, accuracy, and speed of fundamental insurance processes (underwriting, claims processing and customer service).

Quantitative Analysis

The quantitative findings for RQ1 revealed the general perception of a positive impact of AI on the speed, accuracy, and efficiency of fundamental insurance processes like underwriting, claims processing and customer service. Respondents indicated that underwriting was expedited significantly through use of AI (92 respondents agreed or strongly agreed), and errors in claims processing were reduced through the use of AI (132 respondents agreed or strongly agreed). However, a sizeable proportion of respondents (49) were either neutral or disagree when it came to assessing the effect of AI on underwriting accuracy, with some respondents questioning the reliability of AI under complex underwriting scenarios.

Regression analysis further showed that AI familiarity was a significant predictor of perceived improvements of operational functions and the perceived improvements of those who were more familiar with AI technologies. The data indicated that respondents with "Very Familiar" or "Somewhat Familiar" levels of knowledge in relation to AI rated improvements at much higher levels than those not familiar with AI (i.e., "Not Familiar") which does indicate the critical importance of exposure and education to Shape positive attitudes towards AI adoption.

In turn, the results of the tests (using the statistical analysis known as ANOVA) established that familiarity with AI tools was statistically associated with perceptions of faster processing times and greater operational efficiency particularly in claims processing. This further supports the hypothesis that there are tangible benefits of using AI in the P&C insurance operation in the form of time saving, reducing errors and overall performance of the insurance operation. However, the mixed responses associated with underwriting accuracy imply that while AI is making a

contribution to efficiency, it may not be as conducive to human capabilities in more nuanced or complex risk assessment yet.

Qualitative Analysis

Qualitative analysis of secondary sources of data further confirmed the positive role of AI in enhancing operational efficiency. Academic literature, such as Kondeti (2025) and Joshi (2025), emphasized that AI-driven automation in underwriting workflows can decrease the laboriousness and boost the decision-making process to improve the efficiency of the underwriting and claims operations in general. Predictive models as discussed about by Aragani (2024), have also demonstrated to improve the accuracy of claims risk assessment that is consistent with the quantitative results about reducing error in claims processing.

However the literature also suggested challenges in the complete automation of these processes. Scholars like Benze [2021] and Rehman [2024] have promoted the notion that computer AI machines, while being able to perform routine, data-driven, tasks, human expertise is very much important in order to render complex decision-making scenarios, such as underwriting for non-standard policies. This is consistent with the neutral or skeptical opinions by some respondents about the role of AI in underwriting accuracy, pointing to an AI role as a complement to (and not a replacement for) human expertise.

In summary, both the quantitative and qualitative findings emphasize the fact that AI is driving improvements in efficiency, speed and accuracy of key processes in the insurance industry, especially in connection with claims processing and customer service. However, AI's role in underwriting is something that is still more contested, with respondents accepting the role of AI in streamlining workflows, but indicating caution regarding its ability to complete complex and judgment-based tasks.

Discussion of Findings for RQ2: How has the dependence on traditional intermediaries in the P&C insurance sector changed since the adoption of AI solutions?

Quantitative Analysis

The quantitative results for RQ2 showed the significant change of the traditional intermediaries such as brokers and agents. A majority of respondents (73) agreed that their dependence on brokers had lessened since the implementation of AI. 83 respondents agreed that AI is now taking over tasks traditionally done by intermediaries. This suggests that everyday transactional processes, such as policy quoting, eligibility check and claims submission are all being automated using AI tools.

However, there was a considerable share of respondents (42) who disagreed with the statement of their reduced reliance on intermediaries suggesting that either for some customer segments or for the types of policies, human intermediaries are still considered as necessary. This divergence indicates the hybrid model that continues in terms of AI taking over routine, repetitive tasks whilst intermediaries still maintain their importance to take up advisory roles that involve more complex rules.

Additionally, when asked why intermediaries are important, a large number of respondents (62 strongly agreed, 61 agreed) confirmed that intermediaries are important to deal with complex P&C insurance needs. This supports the idea of partial disintermediation where AI facilitates automation, but still human expertise is required for the interpretation and advice provided in non-standard risks.

Qualitative Analysis

The qualitative analysis confirmed the results of partial disintermediation. Academic literature, such as Rehman (2024) and Mazure and Mazure (2023) suggested that AI is able to achieve the functional of transactions efficiently, but intermediaries are transforming to become more advisory. AI tools such as automated policy quoting platforms and digital claims assistants have simplified the demand for any human interaction for routine tasks, however, they are still

essential when complex cases requiring human judgment, negotiation, and trust-building are issued.

Corporate reports, such as from PwC (2023) and McKinsey & Company (2024) also confirmed such trend, noting that the use of AI has resulted into shift towards more strategic and consultative roles for intermediaries, especially in dealing with compliance-heavy situations or personalized policy advice. This is in the line with the mixed answers from the survey where people recognized that this had led to less routine intermediary tasks in favor of the need for human involvement in more complex cases.

In sum, based on both the quantitative and qualitative results, the adoption of AI has resulted in a decrease in the dependence on traditional intermediaries for regular and routine tasks, but human brokers and agents are still essential for the personalization and more complex or compliance-heavy aspects of the insurance process.

Discussion of Findings for RQ3: How are the service quality, trust and satisfaction of AI-driven services perceived by the customers compared to traditional human mediated services?

Quantitative Analysis

The results obtained quantitatively for RQ3 showed a mixed perception of AI in customer-facing processes. While many people in the respondents claimed that AI could benefit the speed and responsiveness of customer service (79 out of the respondents claimed that AI responds to customer queries quicker), there was a noticeable split when it came to service quality and trust. A significant amount of respondents (95) agreed that human representatives offered better quality of service than an AI, with many respondents citing the emotional intelligence, empathy and personalized care of human agents. This is in line with the results of McKinsey & Company (2024) and EY (2023) which highlighted that customers favored a hybrid approach whereby AI is used to complement human interaction, not to out and out replace it.

Trust in AI was also another great point of divergence. While 85 participants responded as agreeable when stating that they trusted AI decisions in the insurance processes, 74 participants

responded consequently to disagree being so transparent about its usage. 74 respondents felt that AI algorithms do not translate, with raising issues regarding algorithmic transparency, data privacy and the human element involved in ultimately underwriting the insurance policies. These were also highlighted in the qualitative analysis when respondents had doubts about AI's capability in dealing with sensitive or complex decisions effectively.

Qualitative Analysis

The qualitative analysis provided support to the mixed customer perception towards AI-driven services. Literature from Patil, Rao, and Sharma (2024) confirmed that AI can provide a better access and efficiency to services, which includes quicker response to people with 24/7 availability. However, customers also commented on the absence of empathy and personalization in AI-driven interactions, especially in complex situations of claim settlement where emotional reassurance is key (Benutc, 2021). This is a sentiment that we have seen in the survey results, where respondents indicated that they were dissatisfied with how AI interactions lack emotional intelligence.

Furthermore, the ethical issues surrounding transparency, data privacy and fairness, as discussed by Mbaha (2024) and Folches (2021) were at the heart of the mixed customer perceptions. Customers said they want more transparency in how AI systems make decisions, especially when it comes to sensitive information such as claims processing.

In conclusion, although AI is considered proficient and responsive it falls short in terms of customer satisfaction when compared to human mediated services. The findings indicate that one area where AI is still struggling is trust and service quality, especially in regards to emotional intelligence, transparency, and ethics of use.

Discussion of Findings for RQ4: What are the major regulatory and ethical issues and data privacy issues around the adoption of AI in P&C insurance?

Quantitative Analysis

For RQ4, the quantitative analysis resulted in significant concerns on the privacy, ethical governance, and adequacy of regulatory frameworks. While a majority found adequate regulation of AI systems (86) a high number disagreed with the statement that regulations were keeping up with adoption of AI (60). This means that there is perceived to be a delay in regulatory frameworks that may be ill-equal to handle the speed in which AI technologies are being developed within the insurance industry.

In addition to these, concerns regarding data privacy and bias in algorithms were rife, with many respondents expressing skepticism about AI's ability to make unbiased decisions and manage sensitive customer data responsibly. The results of the T-test supported that there is a significant concern about the possible misuse of personal data by AI systems, which emphasizes the need for better protection of data and ethical oversight.

Qualitative Analysis

The qualitative analysis was used to elaborate further on the issues of regulation and ethics raised in the quantitative data. Academic and corporate sources, including Zetzsche et al (2020) and AXA Group (2024), have outlined difficulties in supplying algorithms transparency and fairness within the scope of AI decision-making. The absence of common ethical guidelines and regulatory frameworks for AI systems in P&C insurance was a common theme with many reports calling for enhanced oversight and cross-border harmonization of AI ethics (OECD, 2021).

Furthermore, the results of the qualitative analysis showed that although companies such as AXA and Allianz have set up internal boards for AI ethics, the regulatory environment is fragmented in this area, with much discrepancy among the different jurisdictions, with respect to the way the AI risks are addressed. This reveals the importance of having more consistent and globally aligned regulations to address AI's ethical and data privacy issues.

CHAPTER VI:

IMPLICATIONS, RECOMMENDATIONS AND CONCLUSIONS

6.1 Introduction

This chapter is a short summary of the research on Artificial Intelligence (AI) driven change and the ongoing disintermediation of the Commercial Property and Casualty (P&C) Insurance Industry. It brings together results from both quantitative and qualitative analysis. It brings forward certain key theoretical, practical, and regulatory effects seen in the study. The chapter explains how new technologies are changing insurance processes, reshaping the role of intermediaries, affecting customer trust and satisfaction, and raising new ethical and governance issues for the P&C Insurance Industry.

The purpose is to combine the knowledge gained from the research and present it in a useful form for business policy makers, industry professional managers, finance departments and planners, and future researchers. The discussion part focus on improvements in operational and financial streamlining, accuracy, and speed. The dissertation explains the need for regulation to protect market integrity, privacy concerns and compliance, uniquely human expertise, and ethical standards.

The chapter includes four sections, as follows: Section 6.1 gives an introduction, Section 6.2 explains the impacts on industry structure, customer relationships, and governance, Section 6.3 brings forth suggestions and recommendations for future academic of practical research, and Section 6.4 concludes the contributions, confirms that the relevance for theory and practice, exposes the need to balance between AI automation, disintermediation, human judgment, fast changing innovation, industry responsibility, efficiency and trust.

6.2 Implications:

6.2.1 Introduction

The results of this dissertation provide important information for practitioners and policymakers interacting with P&C insurance. The information from quantitative and qualitative analysis shows large view of how industry is in growth and giving key suggestion for successful implementation of emerging practices, future research, and strategic planning.

6.2.2 Theoretical implications

The dissertation's work adds to existing theories about digital transformation and socio-technical systems by validating the point that AI is an augmentative not substitutive technology. It helps the concept that while AI helps improving the efficiency, the human expertise plays a major role in judgment-based decisions. The research also goes beyond theories for trust and technology acceptance, where customer trust in AI is not necessarily linked to functionality but instead is based on transparency, ethics and fairness.

6.2.3. Implications for research questions

Implications for RQ1

Efficiency, Accuracy and Speed of Core Insurance Processes

AI's current roles throughout underwriting, claims processing and customer service is to improve speed and eliminate human error. However, full automation is still not practical for certain complex underwriting needs that require human interpretation and historical and current, real world, expertise. Insurers need to invest in the integration of AI, workforce training and updating, and transparency in order to balance of efficiency while being accountable.

Implications for RQ2

Changing Role of Traditional Intermediaries

AI brings down the specific reliance on brokers for basic functions while it has modified the role of intermediaries, who now become expert advisors and compliance resources to P&C buyers. Insurers and providers should provide intermediaries with novel and specific training to

deal with complex situations and customer relationship. They must form a hybrid intermediation model which involves a mix of AI automation and personalized subject matter expertise.

Implications for RQ3

Customer Perception of Services Quality and Trust

Customers do appreciate the efficiency and availability of AI but still the interaction with humans for empathy and clarity. Insurers should create hybrid versions of service models that combine both automation and human support. Transparency in data usage and AI decision-making is more to establish trust and provide an extended-payoff in customer satisfaction.

Implications for RQ4

For Regulatory, Ethical and Data Privacy Issues

Regulatory oversight has not kept pace entirely with the adoption of AI. This dissertation assumes a critical opportunity and responsibility for better, more harmonious governance frameworks (similar to the General Data Protection Regulations (GDPR) in the European Union) to tackle the issues surrounding fairness, accountability and data protection. It presents the finding that P&C insurers and data owners should adopt robust internal policies in ethical concepts and effective data governance while regulators must strive to establish cross-border standards for AI governance.

6.3 Recommendations

6.3.1 Introduction

This study brings to light that while AI has provided opportunities and many significant early wins in cost efficiency and underwriting, policy provision and claims accuracy in the P&C insurance sector, it has also spawned real-life and real-world direct and third hand challenges in regulation, ethics, trust, compliance, public perception and human AI collaboration. The recommendations are aimed at offering practical information to an industry application, recommendations for cost efficiency, retaining experienced human capital, and future research opportunities and needs in suggesting and providing responsible AI integration.

6.3.2 Recommendations for Useful Application

Integrate AI Strategically:

Insurers should integrate AI into the underwriting process and for claims, cradle to grave handling and reporting, and customer service to enhance accuracy, price efficiency and production/update timeliness while backed by an investment in staff training and an increase in infrastructure development and implementation coupled with increased compliance oversight.

Reskill Disintermediated Intermediaries:

Brokers and agents support staff currently doing function that are being increasingly done by disintermediated AI should be retrained for the developing advisory and compliance-oriented activities to support appropriate automation wherever possible. This human capital and knowledge-based history and expertise can ill afford to be lost by the P&C Insurance Industry.

Adopt Hybrid Service Models:

Fuse the efficiency of AI with the human capacity for detail, empathy and historical knowledge to uphold trust and customized human service using transparent communication and open understanding of AI action, methods, algorithms, data protection, storage and use.

Enhance Ethical Governance:

Form internal AI ethics boards and work with regulators to ensure fairness, accountability, and fixed compliance standards on a proactive basis while regulation is being developed. The P&C Insurance Industry can hardly afford to wait for regulation to be promulgated before understanding and leading the governance regulations, standards and regulatory developed frameworks.

6.3.3. Recommendations for Future Studies

AI and Pricing Strategies:

Review how AI models affect pricing, fairness and behavior in insurance markets.

Regional Disparities in the Adoption of AI include the disparities in the adoption of AI between the developed world and developing regions/nations. Resource allocations to these developing areas can yield significant and quality earnings as business processes they become

ingrained into the developed P&C Insurance programs offered to provide coverage to firms in these geographical areas.

Compare the way that different jurisdiction regulate and integrate AI in order to recognize, develop and promulgate best practices and gaps in the governance, processing and customer service.

Ethical and Issues of Transparency:

Investigate algorithmic bias as well as fairness and the involvement of self-management in providing ethical AI systems.

6.4 Conclusion

This chapter has collated the key findings, effects and recommendations of this dissertation on AI driven disintermediation and transformation in the P&C insurance industry. The research has shown that while AI is transforming the way insurance operations are done, its successful integration is dependent on striking a balance between technological advancement, human expertise, ethical governance and customer trust.

The research dissertation concludes that AI technology implementation is augmentative rather than substitutive technology - enhancing efficiency, accuracy and speed in underwriting, claims processing and customer service. It does not cure the need for human oversight in complex and judgment-based scenarios. Traditional intermediaries, including brokers, claims processes, underwriting, loss control engineers, underwriters, finance, pricing, policy development and agents are not being removed from the P&C Insurance world. They are rather shifting into more specific knowledge, development and compliance focused functions, in a hybrid ecosystem, providing for automation, cost efficiency, improved accuracy, more responsive policy issuance and personalized subject matter expertise.

From a P&C insurance buyer's perspective, my dissertation's research concludes that AI provides substantial improvements in responsiveness and accessibility, human interaction remains essential for empathy, fairness, compliance, communication, expertise and emotional assurance -

especially for sensitive topics such as claims, evidence of damage and disputes. There is urgent need of hybrid models for efficient delivery to be attained so that insurers can beneficially use technological efficiencies with the relationship-building strengths of human intermediaries to maintain trust, subject matter expertise and customer/buyer satisfaction.

The results further highlight that there are serious safety and regulatory deficits/unwritten rules in the system and in place today. When P&C insurers are implementing these internal governance mechanisms, there is currently a need for international commonly written standards on how to ensure algorithmic fairness, data protection and accountability maintained. Policymakers and industry leaders should work to assist in the development of clear and enforceable standards that support the current and future approaches to ethics and regulation in AI and disintermediation innovation.

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APPENDIX A:

QUESTIONNAIRE

Instructions

Please read each statement carefully and indicate how strongly you agree or disagree.

SECTION 1 – Demographic Information - check the box that best describes you.

1. Your role:
☐ P&C Insurance professional (e.g., underwriter, claims manager, digital transformation officer, agent or broker)
☐ Commercial P&C policyholder

2. Years of experience in the P&C insurance industry:
☐ 1–5 years
☐ 6–10 years
☐ 11–20 years
☐ More than 20 years

3. Type of primary P&C insurer you work with or purchase from:
☐ Traditional insurer
☐ Insurtech company

4. Familiarity with AI in P&C insurance:
☐ Very familiar
☐ Somewhat familiar
☐ Slightly familiar
☐ Not familiar

5. Organization size (number of employees):
☐ Fewer than 250
☐ 251–1000
☐ 1,001 – 5,000
☐ 5,001 or more

Use the following scale:
1 – Strongly Disagree 2 – Disagree 3 – Neutral 4 – Agree 5 – Strongly Agree

SECTION 2 – Impact of AI on Commercial P&C Operational Functions

6. AI has made P&C underwriting faster than traditional methods.
☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

7. P&C Claims are processed more quickly with AI than by traditional means.
☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

8. AI improves the accuracy of P&C underwriting.
☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

9. AI reduces errors in P&C claims management.
☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

10. AI responds to P&C customer queries more quickly compared to traditional methods.
☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

11. AI is available 24/7 to assist P&C customers, enhancing their accessibility and support experience.

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

SECTION 3 – Changes in Reliance on Traditional Commercial P&C Intermediaries

12. I rely less on brokers or agents in the last 4 years since AI was introduced to P&C insurance.
☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

13. AI now handles tasks once done by intermediaries.
☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

14. Intermediaries remain important for complex P&C insurance needs.
☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

15. AI has reduced the frequency of my interactions with intermediaries.
☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

SECTION 4 – Customer Perceptions of AI Enabled vs. Human Mediated Services

16. AI services provide accurate and consistent information.
☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

17. AI helps me find the right P&C insurance product more easily than traditional methods
☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

18. Human representatives provide better service quality than AI. (reverse-coded)
☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

19. I trust AI decisions in insurance processes.
☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

20. AI explains its decisions clearly.
☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

21. I am more comfortable trusting a human representative than AI. (reverse-coded)
☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

22. I am satisfied with the speed of AI services, including claims processing, underwriting, and customer support. ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

23. Overall, I am satisfied with AI based insurance services, including underwriting, claims processing, and customer support. ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

24. I would recommend Ai based P&C insurance services to others.
☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

SECTION 5 – Regulatory, Ethical, and Data Privacy Challenges

25. AI systems in P&C insurance are adequately regulated.
☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

26. P&C Insurance Regulations are keeping pace with AI adoption.
☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

27. More regulatory oversight is needed for AI in P&C insurance. (reverse-coded)
☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

28. AI makes P&C decisions without bias or discrimination.
☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

29. AI processes are fair to P&C customers across different demographics and needs.

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

30. My data is secure when used by AI.
☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

31. AI handles sensitive P&C information responsibly.
☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

32. I am concerned about the potential misuse of my data by AI.
☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

APPENDIX B:

INFORMED CONSENT

Research Title:

Artificial Intelligence - Driven Disintermediation

And Transformations in Commercial

Property and Casualty Insurance

Principal Investigator: My name is Michael J. Saltzstein. I am a Doctor of Business Administration (DrBA) student at the Swiss School of Business and Management Geneva, Switzerland (SSBM GENEVA). I am conducting a research study for my doctorate and invite and request that you to participate in the facts and data collection.

Purpose of the Study:

The purpose of this study is to investigate the extent to which Artificial Intelligence (AI) adoption has influenced key operational functions within the Commercial Property and Casualty (P&C) insurance industry, including underwriting, claims processing, data privacy, AI regulation, marketing, and customer service. The study also aims to assess how AI has impacted the role of traditional intermediaries, customer perceptions, and the regulatory and ethical issues surrounding AI in these contexts.

Procedure:

If you agree to participate, you will be asked to complete a structured survey. The survey will include questions about your experiences, preferences, and perceptions regarding AI as it impacts P&C Insurance. The survey will take approximately 15–20 minutes to complete.

Confidentiality:

All information you provide will be kept confidential and used solely for academic purposes. Your responses will be anonymized (no identifying data or IP address will be collected) to ensure that no personally identifiable information is included in the study's results. The data will be securely stored and accessed only by the researcher and authorized personnel.

Potential Risks and Benefits:

There are no significant risks associated with participating in this study. Your participation will contribute to valuable insights into improving P&C strategies, which may ultimately benefit consumers and the P&C industry as a whole.

Consent Statement:

By submitting the survey on Google Forms, you confirm that you have read and understand the information provided above. You consent to participate in this study and allow the researcher to use your responses for academic purposes. Once your data is submitted, it cannot be individually identified, modified or removed from the response pool.

Thank you. Please call with any questions.

Michael J. Saltzstein