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Strategies for Real Estate Brokers to Compete in an Increasingly Technology-Driven Market: Exploring the Value of Information Search and Transaction Management.

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Abstract

This research examines the evolving role of Real Estate brokers in South Africa in the context of advancing technology, specifically focusing on Information Search and Transaction Management services. With the traditional information asymmetry enjoyed by brokers being eroded by technological advancements, the study explores how these changes affect the perceived value of brokerage services. Employing a quantitative approach, including a literature review and online surveys targeting consumers and brokers, the study aims to understand the impact of technology on Real Estate brokerage services and identify effective strategies for brokers to remain competitive in a technology-driven market.

The findings indicate a significant evolution in brokerage services, particularly in enhancing information search efficacy, owing to technological integration. The study also reveals that specific elements like negotiation skills and property-client matching significantly contribute to service value. Interestingly, areas like conflict resolution still heavily rely on the broker's human skills, suggesting a balanced need for technological and human elements in brokerage services.

The research concludes that successful Real Estate brokers in a technology-driven market are those who effectively blend technology with their unique human capabilities. The study's implications point to the necessity for continual adaptation and technological integration by brokers, while also emphasizing their irreplaceable human elements. Future research directions include exploring effective technologies in various brokerage service aspects and potential advancements in currently underserved areas like transaction conflict resolution.

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1. Introduction

Research Topic Overview

The research topic is centred on evaluating the role and value of Real Estate brokers in South Africa's residential property market, especially in the context of their commission-based earnings, which in 2022 were estimated to be between R8.7 billion and R21.7 billion (Rousseau, 2023; Wiese, 2013). Given the increasing accessibility of Real Estate information online, the necessity and effectiveness of brokers in facilitating transactions are scrutinized. The theoretical underpinning of the study relies on the economic theory of transaction costs (Coase, 1937; Williamson, Oliver E., 1981), which examines the impact of negotiation, monitoring, and contract enforcement costs on market efficiency and organizational structures. Furthermore, the study references DiPasquale and Wheaton's (DiPasquale & Wheaton, 1992) categorization of Real Estate markets and the role of intermediaries in reducing transaction costs, particularly in the Real Estate space market.

The decision of consumers to employ Real Estate services is often influenced by the intricacies of property transactions and associated costs, with brokers playing a crucial role in mitigating these through their expertise. However, the justification of their commission fees is a point of contention (Larceneux, Lefebvre & Simon, 2015). Technological advancements, particularly Automated Valuation Models (AVMs) (Saull, Baum & Braesemann, 2020), have diminished the information asymmetry that once favoured brokers, thereby challenging their traditional information advantage and calling for more valuable intermediary services to justify their fees (Agarwal et al., 2019; Levitt, Steven D. & Syverson, 2008).

The aim of the study is to explore how technological advancements have influenced the services offered by brokers, particularly in the realms of Information Search and Transaction Management. The research aspires to identify strategies that can help brokers maintain their competitive edge in a technology-driven market.

Problem Statement

Advances in technology have eroded the traditional information asymmetry enjoyed by brokers, resulting in a need for buyers and sellers to derive increased value from intermediation, specifically Information Search and Transaction Management, offered by brokers to ensure that brokerage fees continue to be perceived as value for money.

Research Questions

- What are the primary services provided by Real Estate brokers in the context of Information Search and Transaction Management, and how have these services evolved in response to advances in technology?

- How have advances in technology affected buyers' and sellers' perceptions of the value of brokerage services in Real Estate transactions, and what are the factors influencing these perceptions?

- What specific elements of Information Search and Transaction Management are most valued by buyers and sellers in Real Estate transactions, and how do these elements contribute to their perceived value of brokerage services?

- What strategies can Real Estate brokers employ to differentiate themselves and compete in an increasingly technology-driven market, and how effective are these strategies in terms of attracting and retaining clients?

Research Aim

This study aims to investigate the key elements of Information Search and Transaction Management in the context of Real Estate transaction intermediation, and to identify effective strategies for brokers to differentiate their services and compete in an increasingly technology-driven market.

Research Hypothesis

Primary Hypothesis: Technology impacts consumer and broker perceptions of Real Estate intermediation effecting intermediaries ability to sustain a competitive advantage.

Sub-Hypotheses: To address the primary hypothesis, following sub-hypotheses are tested:

H1. The primary services provided by Real Estate brokers in the context of Information Search and Transaction Management have evolved in response to advances in technology.

H2. Advances in technology have affected buyers' and sellers' perceptions of the value of brokerage services in Real Estate transactions.

H3. Specific elements of Information Search and Transaction Management are valued more than others by buyers and sellers in Real Estate transactions and contribute to their perceived value of brokerage services.

H4. Strategies can be employed by Real Estate brokers to differentiate themselves and compete in an increasingly technology-driven market that are effective in terms of attracting and retaining clients.

Research objectives

1. To identify the primary services provided by Real Estate brokers in the context of Information Search and Transaction Management.

2. To explore how advances in technology have affected buyers' and sellers' perceptions of the value of brokerage services in Real Estate transactions.

3. To determine the specific elements of Information Search and Transaction Management that are most valued by buyers and sellers in Real Estate transactions.

4. To develop effective strategies for Real Estate brokers to differentiate their services and remain competitive in a technology-driven market.

Research method

This study employs a quantitative approach adopting a postpositivist worldview. The literature review in chapter 2 identifies the constituent elements of Information Search and Transaction Management in relation to Real Estate transactions and these are formally defined in chapter 3.

To address the primary hypothesis, four sub-hypotheses are developed and tested. Two hypotheses relate to consumer perceptions of Information Search and Transaction Management whilst a further two hypotheses relate to broker perceptions of Real Estate technology and strategy.

Survey questionnaires designed to assess the attitudes of both consumers and providers of Real Estate services towards these elements have been developed. The surveys were distributed to a broad, randomly selected sample of consumers of Real Estate services and Real Estate brokers. The potential impact of buyers' and sellers' perceived value of the identified elements and the influence of technology was surveyed using conjoint analysis. Similarly, broker attitudes to the identified elements and the influence of technology were surveyed using conjoint analysis.

Data collected from the survey has been analysed using descriptive statistics and regression analysis to identify the most significant factors influencing buyers' and sellers' perceptions of brokerage services.

Report Outline

The research report is structured into the following five chapters:

Chapter 1: a brief outline of the research topic is given, followed by succinct statements of the research problem; the research questions; and the research proposition. The aim and objectives of the research are defined; and are followed by a short description of the research methodology.

Chapter 2: Overview of the Real Estate market and the role of Real Estate agents. Theoretical frameworks related to the study (e.g., Coase's theory of the firm) and empirical studies related to the study (e.g., Agarwal et al., 2019; DiPasquale & Wheaton, 1992; Larceneux et al., 2015; Glumac et al., 2019). A summary of key findings and gaps in the literature

Chapter 3: Consolidation of the principal issues raised in chapter 2 and proposes an opinion survey-based research design followed by statistical analysis to address the research questions.

Chapter 4: Comprises the analysis and interpretation of the questionnaire survey together with a discussion of the findings.

Chapter 5: Describes the extent to which the data supports the hypothesis revealed in the previous chapter and the effectiveness of those approaches in order to answer the research questions in more detail and attain the specified research objectives

2. Literature Review

Introduction

This literature review provides a comprehensive exploration of the economic dynamics, market behaviours, intermediation effects, and the impact of technological advancements within the realm of residential Real Estate. Delving into key theories, concepts, and models that underpin our understanding of the complex mechanisms governing Real Estate markets.

The review initiates with an examination of the core concept of Transaction Cost Economics (TCE), studying its relevance and application to Real Estate markets. From the seminal work of Ronald Coase (Coase, 1937), which posits firms as entities designed to reduce transaction costs and enhance efficiency, to the further illumination of transactions, economic organisation, and governance structures by Oliver E. Williamson (Williamson, Oliver E., 1981; Williamson, Oliver E., 1989; Williamson, O. E., 1998), we delve into the theoretical foundations that shape our understanding of economic dynamics within the industry. We also explore the role of efficient transaction management, property rights, and institutional arrangements within the Modern Institutional Economics framework, drawing upon the Four Quadrant Model by DiPasquale and Wheaton (DiPasquale & Wheaton, 1992) for its elucidation of Real Estate market structures.

Following this, the market for Real Estate space is explored, shedding light on the market for Real Estate services. The review juxtaposes the perspectives of neoclassical economics with institutionalist/behaviourist schools of thought, focusing on market agents, services, and exchanges. It explores the complexities and frictions that arise within Real Estate transactions due to imperfect information, risk factors, and cognitive biases. A particular focus is applied to the theory of search and matching, signalling theory, and their collective impact on market efficiency.

Attention is then directed towards the intermediation effects in Real Estate transactions. This section scrutinizes the conditions fostering the emergence of intermediated markets, outlining the value of Real Estate brokers in reducing transaction costs and uncertainties. The discussion extends beyond the individual intermediary, examining the role of intermediary networks and the use of social capital in mitigating trading frictions.

Finally, the dynamic interplay between technology and the Real Estate industry is dissected, particularly focusing on the burgeoning Real Estate Fintech sector. The review analyses divergent perspectives on the role and impact of technology, discussing Baum's (Baum, 2017) seminal work on the industry's tensions in

the face of technological advancements. We examine the theories of disintermediation and reintermediation, focusing on the transformative rather than destructive role of technology within Real Estate brokerage. Concluding with an in-depth analysis of 'Platform Real Estate' (Shaw, 2020), exploring the potential of virtual markets as a reintermediating force within the industry.

In essence, this literature review offers an exhaustive, balanced, and nuanced understanding of the intricate relationship between economic dynamics, market behaviour, intermediary roles, and technology within the Real Estate industry. It provides insights into the transformative potential of these mechanisms, illuminating implications for the future of the industry.

Transaction Cost Economics

Rooted in Price Theory and the concept of market equilibrium under conditions of perfect competition developed by the likes of Adam Smith, David Ricardo, and Alfred Marshall (Bloch, 2020), Ronald Coase's seminal work The Nature of the Firm (Coase, 1937) sets out to explain the existence of firms and the conditions under which firms emerge as opposed to market transactions. Focusing on the costs incurred in the process of exchanging goods, services, or assets between two or more parties, Coase (Coase, 1937) finds that transaction costs can have a significant impact on the efficient operation of markets and that it may be more efficient for parties to form long term contracts with specific partners instead of relying on the open market. Coase proposed that through hierarchical control and coordination firms reduce transaction costs and improve efficiency. In this sense the firm refers to a system of economic coordination, which can take many forms, without which economic activities would take place through individual market transactions based on prices.

Building on Coase's work, Oliver E. Williamson (Williamson, Oliver E., 1981; Williamson, Oliver E., 1989; Williamson, O. E., 1998) sought to understand the nature of transactions and the factors that shape economic organisation and governance structures. Williamson (Williamson, Oliver E., 1989) draws a helpful comparison between friction in mechanical systems and transaction cost in economic systems to explain the concept of Transaction Cost Economics (TCE), where in economics, the concept of transaction cost serves as an equivalent to friction. This involves assessing whether the parties involved in a transaction collaborate smoothly or if frequent misunderstandings and conflicts lead to delays, breakdowns, and other inefficiencies (Williamson, Oliver E., 1989:142).

Williamson (Williamson, O. E., 1998), adopting a postpositivist worldview, acknowledges that whilst TCE has broad appeal, especially to any problem that can be reformulated as a contracting problem, it's application will be better suited to some areas more than others and, like all explanations in the social sciences, TCE is a partial mechanism rather than a general theory. TCE has been criticised by proponents

of Modern Institutional Theory for giving little consideration of how behaviours can emerge and continue due to habits, conventions, convenience, or social obligations (Oliver, 1991:151).

Similar criticisms have been raised by the likes of Lazonick and Menard (Lazonick, 1991; Menard, 1997). However, several attempts have been made to reconcile these approaches (Rawlence, 2010; Roberts & Greenwood, 1997) with Roberts & Greenwood concluding that organisations that prioritise efficiency-seeking, as opposed to maximising efficiency, tend to favour current, legitimated, and familiar designs in their efforts to achieve organisational efficiency. This approach considers the cognitive and institutional contexts in which entities decide on adopting designs. By integrating these frictions into an efficiency-based adoption framework, this perspective significantly enhances our understanding of transaction cost theory (Roberts & Greenwood, 1997:367).

Modern Institutional Economics (Rawlence, 2010; Roberts & Greenwood, 1997; Williamson, Oliver E., 1989; Williamson, O. E., 1998), with transaction cost economics as a central concept, provides a useful lens through which to consider the functioning of Real Estate markets. Transaction cost economics highlights that efficient transaction management can help mitigate the costs associated with information gathering, contract negotiation, and monitoring. Technology driven efficiencies in information search and transaction management can help market participants save time and resources, contributing to their competitive edge in the market.

Furthermore, Modern Institutional Economics highlights the significance of property rights and contracts as institutional arrangements that influence economic behaviour. Secure property rights are seen as crucial for promoting investment, innovation, and efficient resource allocation.

Modern Institutional Economics emphasizes that the institutional environment, including market regulations and norms, can influence the strategies and behaviour of economic actors. Brokers must adapt to the changing institutional landscape wrought by technology.

Four Quadrant Model

DiPasquale and Wheaton's (DiPasquale & Wheaton, 1992) conceptual framework for Real Estate Markets – the four quadrant model (Figure 1) – is a theoretical tool for the study of Real Estate Markets that has been widely cited in the literature and has helped to inform research and practice in the field of Real Estate economics despite being criticised as a simplification of market dynamics (Lisi, 2015).

While the Four Quadrant Model is grounded in neoclassical economic theory, it is important to note that elements of institutional economics highlighted earlier are relevant to understanding the complexities of

Real Estate markets, such as the role of local regulations, zoning laws, social norms, and other institutional factors that influence the decisions effecting Real Estate supply and demand.

The model highlights the relationship between the market for Real Estate space (determined by the user of space), the market for Real Estate assets (financial market), and the development market. The model also identifies key drivers of Real Estate pricing, including supply and demand, demographic and economic trends, and capital market conditions.

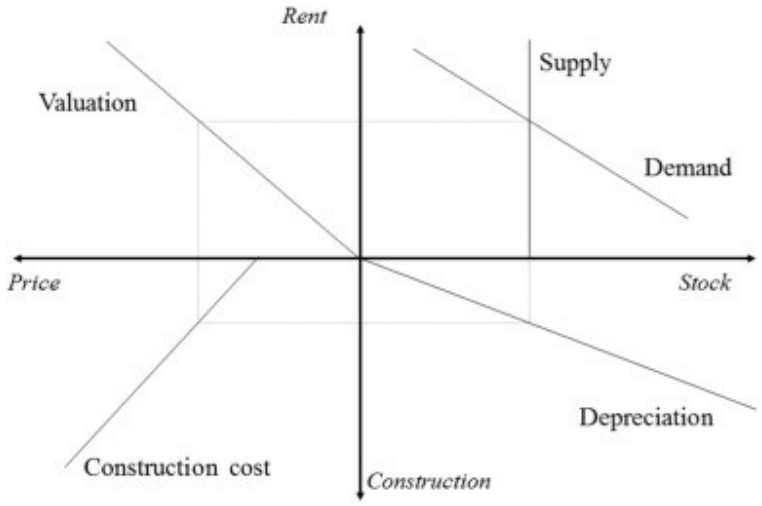

Figure 1 DiPasquale and Wheaton Four Quadrant Model (DiPasquale & Wheaton, 1992:18-37)

The model functions by proposing that since the supply of property in the short term is inelastic rentals / prices rise. The increased rentals are received as cashflows by property investors who capitalise the increased cashflows at an appropriate capitalisation rate (the cost of capital) resulting in increased property values.

Since developers will only engage in development where the all-in costs of development are equal to property values, increased property values increase the viability of development projects. As more projects become viable so additional development takes place increasing the supply of property in the long term and ceteris parabis prices decrease.

Market for Real Estate Services

Within the market for Real Estate Space exists the Market for Real Estate Services and, as with all markets, consists of the following essential elements: economic goods/services, economic agents and economic exchanges (Callon & Muniesa, 2005). Figure 2 below provides a graphical depiction of the market structure it's key participants, outcomes of price and liquidity, the exogenous influence of broader market factors,

and the influence of intermediary services or factors on information search and bargaining activities between buyers and sellers. However, these models are merely an abstraction of the fact that markets are messy socially constructed phenomena (Shaw, 2020). De Landa (De Landa, 2006) and Muniesa (Muniesa, 2007) quoted by Shaw (Shaw, 2020) make the following points:

> *the role of both human and non-human actors in the market should be considered in relation to the overall assemblage of agencies that defines it as such (De Landa, 2006). (Shaw, 2020:1040)*
>
> *This especially includes those market devices that constitute the material and social assemblages that intervene in the construction of markets" (Muniesa, 2007). (Shaw, 2020:1040)*

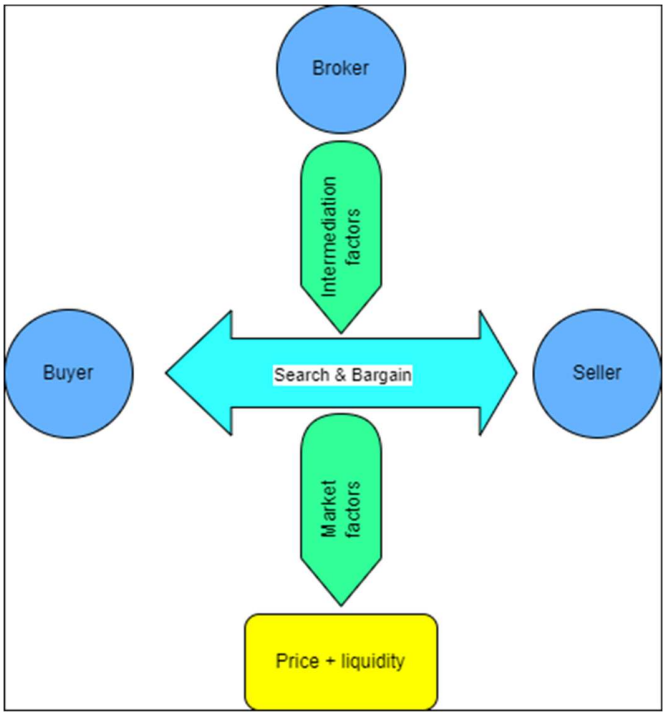

Figure 2 Housing market microstructure (Han & Strange, 2015)

Highlighting one of the key points of departure between the Neoclassical school of economic thought on the one hand and the Institutionalist / Behaviourist schools of thought on the other is the concept of rational economic actors. Both institutional economics and behavioural economics challenge the strict rationality assumption of neoclassical economics and consider a broader array of influences on economic behaviour. While institutional economics emphasizes the role of institutions and their impact on economic systems, behavioural economics delves into cognitive biases and psychological factors affecting individual choices (Chang, 2015).

Trading Friction

The simple supply and demand curves describing the operation of the market for Real Estate space is an abstraction of the messy social construct that is the market. Williamson (Williamson, 1981) emphasizes that the choice between the use of markets or internal organization depends on the extent of transaction-specific investments, the frequency of transactions, the uncertainty of future events, and the degree of asset specificity. In the case of residential Real Estate, economic exchanges are based on heterogeneous economic goods, highly transaction specific investments, of low frequency, and of relatively high uncertainty. A number of studies have highlighted that the decision to buy or sell a house represents, for most people, a great deal of risk given that it is likely to be the most expensive transaction they will undertake in their lives, that they may literally have to live in their choice, and that since the same buyer and seller are unlikely to engage in a subsequent transaction, there is little incentive for either to act outside of their own short term self-interest (Benites-Gambirazio, 2020; Crowston, Sawyer & Wigand, 2015; Larceneux, Lefebvre & Simon, 2015; Wigand, 2020). In short, imperfect information coupled with the fact that a poor decision could be costly to live with and costly to rectify represent market deficiencies or trading frictions (Han & Strange, 2015).

Behaviourists make observations to the effect that market incentives and information asymmetries alone do not explain all trading frictions. Benabou and Tirole (Bénabou & Tirole, 2003) reveal how extrinsic motivation in the form of rewards and punishment may be counterproductive because they undermine intrinsic motivation thereby introducing unnecessary friction to the market. Kahneman et al (Kahneman, Knetsch & Thaler, 1991) in describing what they term the Loss Aversion Effect, show how economic actors often ascribe greater value to an item they poses than they would be willing to pay to acquire it, suggesting the pain of giving up a property contributes to trading friction. In addition, they make the observation that "people treat opportunity costs differently than "out-of-pocket" costs, foregone gains are less painful than perceived losses" (Kahneman, Knetsch & Thaler, 1991:203). Kahneman et al argue that ignoring loss aversion in models leads to predictions that exhibit greater symmetry and reversibility than what is observed in the real world. Such models overlook significant differences in how individuals respond to gains compared to losses. It is essential to recognize that responses to price increases and decreases may not always mirror each other perfectly. The presence of loss aversion effects indicates that when analysing responses to changes in economic variables, it is crucial to routinely differentiate between favourable and unfavourable changes (Kahneman, Knetsch & Thaler, 1991).

Search and Matching

Yinger (Yinger, 1981) and later Wheaton (Wheaton, 1990) built on Search and Matching models developed from labour market research to describe how uncertainty and costly search friction, inherent in the market

for Real Estate space, influences how market participants behave. Wheaton's (Wheaton, 1990) empirical model describes how, initially, the number of homes and the number of people or families wanting homes stay the same. People often need to move because their current home doesn't fit their needs anymore. This need to move influences how actively they look for a new home and the price they are willing to offer. Sellers are just people who have already found a new place and want to sell their old one. They decide how urgently to sell based on how long they expect to wait for a sale and the cost of owning two homes at the same time. If there are more empty homes, it usually takes longer to sell a home, which makes sellers lower their price expectations and speeds up the search for buyers, leading to lower prices overall. The price a seller actually expects to get is the usual market price adjusted for how long they expect to wait to make a sale. Over time, as more new homes are built and added to the market, this process continues until the cost of building a new home matches the adjusted price sellers expect. The point where this balance happens is considered the markets structural rate (Wheaton, 1990:1272).

Wheaton's model goes on to describe how an improvement in the rate of matching causes sales to increase reducing the time on market lowering vacancies and increasing prices. The point being made that with greater uncertainty and imperfect information, the return on an investment in improving search effort (technology) increases.

Lisi (Lisi, 2015) extends the four quadrant model by incorporating both Wheaton's search model and a simplified version of Mortensen-Pissarides matching model to describe the impact of trading frictions prevalent in search models on the operation of the market for Real Estate space. In addition, whilst Wheaton's model search and matching model assumes that parties to a transaction have equivalent bargaining power, subsequent studies have proposed that differences in bargaining power are an inseparable part of the search and matching process (Han & Strange, 2015; Lisi, 2015).

Signalling

Information asymmetry resulting from the heterogenous nature of individual properties, together with the heterogenous characteristics and motivations of market participants is the primary source of uncertainty in the market for Real Estate space resulting in trading friction. Whilst a full review of Signalling Theory is beyond the scope of this dissertation, Connelly et al's (Connelly et al., 2011) review of Signalling Theory literature provides insight into how market participants might engage in behaviours in order to reduce information asymmetry regarding the unobservable ability of both a property and or a potential trading partner to meet a given set of needs. Connelly et al (Connelly et al., 2011) surmise that efficacious signals have two chief characteristics. Firstly, the actions of market participants to signal information must be observable by receivers. Secondly, that some market participants are better able to absorb the costs

associated with providing an efficacious signal especially since signal costs will tend to be structured in such a way that dishonest signals do not pay.

It therefore stands to reason that whilst the costs of search are predominantly born by the buyer, sellers predominantly carry the costs of signalling both of which serve to lubricate the market and in so doing reduce vacancies and improve returns.

Intermediation

Intermediated markets arise in an attempt to mitigate the risks / costs that arise in markets, such as the Real Estate market, characterised by infrequent transactions between participants, high uncertainty of future events, and a high degree of asset specificity (Allen et al., 2015; Han & Strange, 2015; Williamson, Oliver E., 1989).

Crawston et al (Crowston, Sawyer & Wigand, 2015) highlight three mechanisms through which intermediaries in the market for residential Real Estate space aid in mitigating uncertainty and thereby reducing transaction costs. Firstly, since searching for an appropriate property and a motivated seller / buyer is costly, intermediaries act as matchmakers providing and filtering information about supply and demand. Secondly, since Real Estate is heterogenous, intermediaries provide expertise that validates and shares information about specific properties which aids in establishing the value of that property and it's ability to meet a given set of needs. Lastly, in complex transactions, intermediaries may provide the negotiation expertise necessary to conclude a successful transaction mitigating the risk of not concluding a transaction and or incurring ex-post costs. Wigand (Wigand, 2020) group these as the Coordination Costs benefit of intermediaries, whilst Larceneux et al (Larceneux, Lefebvre & Simon, 2015) draw similar conclusions to Crowston et al grouping the first and second mechanisms under the term Information Search and the third under the term Transaction Management. In addition, they make the point that the decision to engage an intermediary is a function of the perceived value provided by the intermediary - which is itself a function of the buyer/ sellers perceived self-expertise or competence to conclude a Real Estate transaction, and the degree of urgency with which a transaction must be concluded - measured against the costs incurred by engaging an intermediary. Similarly, Northcraft & Neale (Northcraft & Neale, 1987) find that simple exposure to Real Estate transactions reduces the degree of anchoring-and-adjustment bias displayed in fair market value estimations of residential Real Estate.

Wigand (Wigand, 2020) makes an important point when criticizing Levitt & Dubner's (Levitt, Steven D & Dubner, 2014)'contention that Real Estate agents deliver less value than the commission paid, he points out that Levitt & Dubner neglected to take into account the costs of doing business, including the share of any commission paid to the brokerage or to another Real Estate agent. Wigand (Wigand, 2020) points out that

when these are considered the value Levitt & Dubner attribute to Real Estate agents is "close to their prediction of the value (consistent with their report that most agents in fact do not earn all that much)".

Wigand (Wigand, 2020) draws on work by Baligh and Richartz (see Figure 3) to describe how the use of an intermediary facilitates Information Search, "The intermediary reduces the number of possible contacts between all trading partners from m ⋆ n to m+ n. Mediation or intermediation has a powerful and important efficiency feature in all forms of trade within an economy".

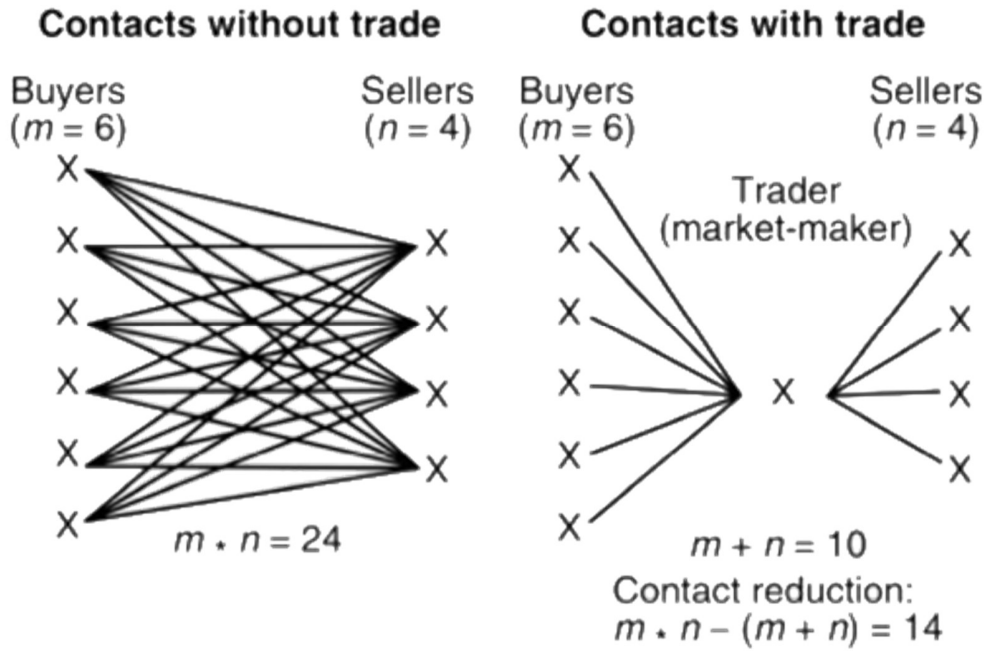

Figure 3 The reduction of necessary contacts through intermediation. (Sources: Baligh and Richartz 1967; Wigand 2020,p. 40).

Yavas et al (Yavas, Miceli & Sirmans, 2001) provide experimental evidence that, whilst brokers reduce the number of bargaining rounds between buyers and sellers they can make it less likely to reach a deal quickly, and it might take longer to finish negotiations. Even if brokers have more information, this doesn't change the situation. Brokers tend to make the selling price go up, but this could depend on how they're paid. Overall, there's no clear proof that brokers make negotiations more efficient. This indicates that the main advantage of using brokers might be in helping buyers and sellers find each other at the beginning of a deal (Yavas, Miceli & Sirmans, 2001:252).

A number of researchers (Levitt, Steven D & Dubner, 2014; Ling, Naranjo & Petrova, 2018; Yavas, Miceli & Sirmans, 2001; Zumpano, Elder & Baryla, 1996) use comparative price outcomes as a measure of whether the use of a broker improves outcomes for buyers and sellers. They regularly find that "The use of an intermediary (broker) increases, on average, the acquisition prices of buyers and decreases the

disposition prices of sellers" (Ling, Naranjo & Petrova, 2018:114) but neglect to consider the costs (including opportunity costs) saved or incurred by using or not using a broker (Bernheim & Meer, 2008a).

To appreciate the value of intermediation, it is important to consider two enhancing characteristics of intermediaries in the Real Estate services market. First, that the reduction in necessary contacts facilitated by an intermediary is not limited to contacts between buyer and seller, intermediaries facilitate the search for providers of services ancillary to the transaction such as legal services, financing services, inspection services, and moving services. In this regard, Crowston et al (Crowston, Sawyer & Wigand, 2015) make the finding that connections with other professionals matter more for a market intermediary's income than connections with buyers and sellers, which goes against the usual beliefs about real estate and market intermediaries in general (Crowston, Sawyer & Wigand, 2015:361).

Secondly, that intermediaries themselves form networks or firms that has the potential to provide an exponential number of possible matches without a proportionate increase in the number of contacts (Johnson, Springer & Brockman, 2005; Larceneux, Lefebvre & Simon, 2015; Wigand, 2020; Yavas, Miceli & Sirmans, 2001; Yinger, 1981). In this context "Real Estate agents are not simple intermediaries but rather become market makers at the centre of a system of coordination matching buyers, sellers, and goods"(Benites-Gambirazio, 2020:154). Bernheim & Meer (Bernheim & Meer, 2008b) provide compelling evidence that broker networks account for all value derived by sellers by using a broker.

Drawing on the concept of social capital, more specifically the perspective that "Real Estate transactions are embedded in social networks and take advantage of an agent's social capital for achieving transactional efficiencies" Saber and Messinger (Saber & Messinger, 2010) provide a useful framework for considering how Real Estate agents aid in resolving trading frictions that exist in the market for Real Estate space. The framework considers three interrelated and overlapping components namely structural, relational, and cognitive.

Structural components, aligning with the findings of Crowston et al noted previously, encompass the pattern of connections between actors, including network ties and network configurations, which enable efficient communication and goal achievement within a transaction. Agents with advantageous network ties and configurations have inherent structural advantages in the context of sales and transactions.

Relational components encompass trust, norms, sanctions, obligations, expectations, and identification with the social network structure. For residential Real Estate agents, relational advantages stem from the trust customers have in their expertise, the existence of legal and normative ethical obligations, the availability of sanctions, and the fulfilment of expected obligations. These components contribute to the efficiency and

effectiveness of actions within Real Estate transactions. This component may serve to signal and inject trust into transactions between participants who are unlikely to engage in future transactions.

Cognitive components encompass shared representations, interpretations, and systems of meaning among actors. These components include shared language, codes, and shared narratives which on their own serve to improve the quality of market signals and lubricate the interaction of market participants by providing, as an example, a standardised way of describing properties. In the context of Real Estate transactions, cognitive social capital of agents involves knowledge of transaction steps and participants, as well as expertise in interpreting the intent and meaning behind actions taken during negotiations. These cognitive components contribute to the transactional efficiency and effectiveness within the Real Estate industry which is very much aligned with the transaction management element described by Larceneux et al.

In Summary, consumers engage with the market for Real Estate services due to the heterogenous nature of residential Real Estate and the significant transaction costs, or risks, associated with buying or selling a property. These costs include the time and effort required to find a suitable property, negotiate with the other party, and complete the transaction. There are also costs associated with obtaining financing, arranging for inspections, handling legal and regulatory requirements, and finally the costs of physically moving.

Using a broker can potentially reduce these transaction costs by providing expertise and guidance throughout the buying or selling process. Brokers can assist in searching for properties, evaluating potential properties, negotiating with the other party, and handling the paperwork involved in the transaction. By utilizing the services of a broker, buyers and sellers may be able to save time and money that would otherwise be spent on transaction costs. However, there are also costs associated with using a broker, such as the commission paid to the broker, which must be weighed against the potential benefits of using a broker, such as the expertise and guidance they provide.

Concepts: Information Search and Transaction management

Whilst the concepts of Information Search and Transaction management are not well defined in the literature, within the context of residential Real Estate and for the purposes of this research, these concepts are defined below in terms of their attributes, antecedents, consequences, and empirical indicators (UCT, 2015).

Concept: Information Search in Real Estate Transactions

Attributes:

Market Expertise: Brokers possess extensive knowledge about the local housing market, including current trends, property values, and neighbourhood characteristics.

Access to Information: Brokers have access to listing and property information databases including brokerage databases and share listing services such as Multiple Listing Service (MLS) or Property Listing Network (PLN), providing them with comprehensive information about available properties and their specifications.

Risk Reduction: Agents assist in mitigating uncertainties by providing information about market conditions, property quality, and negotiation strategies.

Communication Skills: Effective communication between agents, buyers, and sellers is crucial for conveying relevant information, preferences, and offers accurately.

Antecedents:

Transaction Uncertainty: Real Estate transactions involve uncertainty due to incomplete information about property values, market trends, and negotiation outcomes.

Lack of Market Knowledge: Buyers and sellers often lack in-depth knowledge of the Real Estate market, leading to a need for professionals who can provide accurate information.

Transaction Complexity: The intricate nature of Real Estate transactions necessitates professional assistance to manage various legal, financial, and negotiation challenges (Crowston, Sawyer & Wigand, 2015; Larceneux, Lefebvre & Simon, 2015; Wigand, 2020; Zumpano, Elder & Baryla, 1996).

Consequences

Informed Decision Making: Buyers and sellers are better equipped to make informed decisions regarding property prices, offers, and negotiations.

Efficient Transactions: Proper information search leads to more efficient and successful property transactions.

Risk Mitigation: Buyers and sellers can reduce the risk of making poor decisions or being taken advantage of in the transaction process.

Improved Market Positioning: Agents help sellers position their properties effectively in the market through accurate pricing, marketing strategies, and property presentation.

Reduced Emotional Stress: Expert guidance and information provision can help alleviate the emotional stress associated with buying or selling a property.

Empirical Indicators:

Utilisation of listing databases: The extent to which agents utilise listing databases to gather property information and stay updated on market trends.

Market Knowledge: Agents' ability to provide accurate and up-to-date information about property values, recent sales, and neighbourhood conditions.

Communication Quality: Effectiveness of communication between agents, buyers, and sellers in conveying property details, preferences, and negotiation terms.

Transaction Efficiency: The speed and success rate of property transactions facilitated by agents in comparison to those conducted without professional assistance.

Buyer-Seller Matching: Agents' success in matching buyers with suitable properties based on their preferences and needs.

Risk Management: The extent to which agents help clients manage uncertainties related to property valuation, negotiation strategies, and market conditions.

In essence, information search in Real Estate involves the active pursuit of market knowledge by agents to provide accurate information, reduce uncertainty, and facilitate successful property transactions between buyers and sellers.

Concept: Transaction Management in Real Estate

Attributes:

Complexity Handling: Transaction management involves navigating the intricacies of Real Estate transactions, including legal, financial, and negotiation aspects (Crowston, Sawyer & Wigand, 2015; Larceneux, Lefebvre & Simon, 2015).

Negotiation Expertise: Agents possess negotiation skills to help both parties reach mutually agreeable terms, addressing uncertainties and potential conflicts (Crowston, Sawyer & Wigand, 2015; Han & Strange, 2015; Ling, Naranjo & Petrova, 2018).

Knowledge Base: Agents draw from their market, transactional, and service provider knowledge to guide clients through the process, offering insights into pricing, market conditions, and legal requirements (Benites-Gambirazio, 2020; Crowston, Sawyer & Wigand, 2015).

Cost Efficiency: Transaction management by agents reduces the transaction costs that buyers and sellers would incur when handling the process independently (Bernheim & Meer, 2008b; Wigand, 2020).

Antecedents:

Transaction Complexity: The intricate nature of Real Estate transactions necessitates professional assistance to manage various legal, financial, and negotiation challenges (Crowston, Sawyer & Wigand, 2015; Larceneux, Lefebvre & Simon, 2015; Wigand, 2020; Zumpano, Elder & Baryla, 1996).

Information Asymmetry: Unequal access to information between buyers and sellers creates uncertainty, making the need for an intermediary to manage the process more significant (Agarwal et al., 2019; Bernheim & Meer, 2008b; Levitt, Steven D. & Syverson, 2008; "The role and benefits of using estate agents", 2019).

Limited Transaction Experience: Most homebuyers and sellers lack experience in Real Estate transactions, leading to a reliance on professionals who can guide them through the process (Benites-Gambirazio, 2020; Han & Strange, 2015; Larceneux, Lefebvre & Simon, 2015; Wigand, 2020).

Consequences:

Efficient Transactions: Professional transaction management streamlines the buying and selling process, reducing delays and potential errors.

Risk Mitigation: Expert agents help navigate uncertainties and risks associated with negotiations, market dynamics, and legal requirements.

Enhanced Outcomes: Effective negotiation and management can lead to favourable terms and prices for both buyers and sellers.

Time Savings: Agents expedite the process by handling administrative tasks, negotiations, and coordination, saving clients time and effort.

Professional Support: Buyers and sellers benefit from professional advice and assistance, ensuring a smoother and less stressful experience.

Empirical Indicators:

Negotiation Success: Measure of agents' ability to reach mutually beneficial agreements between buyers and sellers.

Transaction Timeliness: Comparison of the time taken to complete transactions with and without professional assistance.

Client Satisfaction: Feedback from clients regarding their experience with an agent's transaction management services.

Conflict Resolution: Ability of agents to effectively address conflicts and challenges that arise during the transaction process.

Legal Compliance: Evaluation of the extent to which transactions managed by agents adhere to legal and regulatory requirements.

In essence, transaction management in Real Estate involves the skilful navigation of complex processes, negotiation expertise, and the use of market and transactional knowledge to facilitate successful property transactions between buyers and sellers.

Impact of Technology

Introduction

Ford et al (Ford, Rutherford & Yavas, 2005) delved into the issue of whether internet based search technology improved market outcomes both theoretically and empirically. Theoretically, due to the reduced search costs on the internet, it results in more extensive buyer search, potentially raising transaction prices. However, it might either speed up or slow down the sale process. Empirically, the findings suggest that houses listed online tend to sell at a slightly higher price – a premium of 1.93% - but stay on the market about 11% longer. The overall conclusion being technology that reduces trading friction is likely to improve market outcomes for buyers and sellers, but what are the implications for Real Estate brokers?

The introduction to Andrew Baum's seminal work on the impact of technology on the Real Estate industry contains the following statement which captures the existing tensions in the market:

> *In this research we interviewed over 50 Real Estate professionals, entrepreneurs and capital providers. From one side, we heard that none of these startups know what they are doing and that young entrepreneurs misguidedly regard Real Estate as a sure thing. From the other, we heard that Real Estate people are not good at strategy and are determined to protect inefficient fee-earning practices (Baum, 2017:1).*

Research by both Shaw & Baum reveal that the technology enterprise sector – Real Estate Fintech - which supports (sale or leasing) transactions within the market for Real Estate space garners a significant amount of attention from technology developers and by extension investors in technology platforms (Baum, 2017; Shaw, 2020).

Baum (Baum, 2017) posits that the Real Estate Fintech sector is attractive to technology investors due to it having a diverse and widely distributed source of demand, which includes homebuyers, home renters. On the supply side, there is also a diverse and widely distributed source, represented by the global Real Estate asset base. Currently, there is no dominant and efficient mechanism for bringing together the demand and supply sides in this sector. Instead, many brokers exist, who often guard information closely, and their survival relies on handling a few significant and high-paying transactions. The potential financial gains in this sector are significant for all parties involved, including the demand side, the supply side, and intermediaries. This is evident from the large round trip transaction costs associated with Real Estate deals. The scalability of the Real Estate Fintech sector is based on the vast global Real Estate asset base, which offers ample opportunities for growth and expansion.'

Disintermediation

A number of studies (Agarwal et al., 2019; Baen & Guttery, 1997; Baryla & Zumpano, 1995; Bernheim & Meer, 2008a; Ford, Rutherford & Yavas, 2005; Larceneux, Lefebvre & Simon, 2015; Wigand, 2020) reflect on predictions in the mid 1990's and early 2000's that the Real Estate brokerage industry faced imminent demise as a result of disintermediation – "the displacement or elimination of market intermediaries, enabling trade with buyers and sellers without the middle person" (Wigand, 2020) - due to the proliferation of the internet and it's potential to reduce the transaction costs attributable to the asymmetry of information between buyers and sellers reducing the value derived from an intermediary.

There is indeed some evidence to support these early predictions of the impact of technology on Real Estate brokerage coming to fruition. In their popular book, Freakanomics (Levitt, Steven D & Dubner, 2014) Dubner & Levitt illustrate lead evidence in support of the proposition that brokers exploit information asymmetry more effectively when selling their own properties than those of their clients. The more effective exploitation of information leading to 3.7% difference in sale price with broker owned properties remaining on the market an extra 9.5 days. However, the broader research conducted by Levitt & Syverson (Levitt, Steven D. & Syverson, 2008) found that the internet has made it easier for sellers to appreciate the characteristics of other houses on the market and to find recent transaction prices reducing the advantage to brokers –

> *"Consistent with the theory, in the period 1992-1995, observationally equivalent agent homes sold for 4.9 percent more than those of their clients and stayed on the market over two weeks longer. From 2000-2002, in contrast, agents obtained only 2.9 percent more for their houses and stayed on the market 2.5 days longer" (Levitt, Steven D. & Syverson, 2008:3).*

It would therefore seem that the information advantage in terms of nature of the property together with associated micro and macro-economic factors has been eroded. This is supported by recent research (Agarwal et al., 2019; Glumac, Herrera-Gomez & Licheron, 2019) showing that the advent of Automated Valuation Models (AVMs) has reduced information asymmetry relied on by Real Estate brokers to some extent as AVMs provide buyers and sellers with cost effective access to more accurate and up-to-date information about property values, which can help to reduce the information advantage that Real Estate brokers may have had in the past.

However, despite this evidence and predictions of an increasingly irrelevant industry, several more recent studies have highlighted that the internet plays a central role in the overwhelming number of residential Real Estate transactions and, despite this, they continue to be conducted via a broker as intermediary (Larceneux, Lefebvre & Simon, 2015; Saber & Messinger, 2010; Wigand, 2020). Baum makes mention of

Zwillow and Trulia (subsequently acquired by Zwillow) a tech firm with revenues of $480million (ZwillowGroupInc., 2023) that "brought Real Estate information online so that consumers can have insightful information at their fingertips instead of solely relying on an agent, just to understand and see available listings". Zwillow continues to operate mainly as lead generating businesses for agents, focused on sending them highly qualified leads (Baum, 2017). Saber & Messinger's (Saber & Messinger, 2010) quantitative research suggests that whilst technology may have eroded the Information Search value of Real Estate agents activities associated with Transaction Management remain valuable. Wigand (Wigand, 2020) supports this position, making the following observation that the role of the agent is evolving to focus more on managing the process rather than just searching for options. Agents now help buyers and sellers understand every part of the transaction, provide services that add value, and ensure that everything progresses smoothly (Wigand, 2020:43).

Similarly, Larceneux et al (Larceneux, Lefebvre & Simon, 2015) make the suggestion that in order to compete in an increasingly technological environment, Real Estate agents should focus their marketing on communicating their Transaction Management capabilities to entice clients with the promise of superior negotiation, facilitation, and administrative capabilities – the relational and cognitive components.

Reintermediation

Wigand (Wigand, 2020) makes the point that technology in the form of electronic markets, is a driver of the Mediation-Disintermediation-Reintermediation of markets through the reduction of transaction costs and may in fact replace existing intermediaries all together. However, while the intermediary may be replaced the function provided by the intermediary still needs to be carried out with technology reintermediating the market albeit at a lower transaction cost.

New Real Estate market technologies are transformative market devices that intervene in the social construction of markets creating opportunities for reintermediation (Shaw, 2020) "breaking apart existing relationships into logical components and reshuffling them to enable more efficiency, choice, or speed"(Wigand, 2020). The concept electronic or virtual markets has been defined by Wigand (Wigand, 2020) as a value web replacing the linear value chain with a dynamic and interactive matrix. It offers a temporary network of independent companies, free from hierarchical structures and vertical integration. Within this web, buying and selling processes become highly interactive and adaptable. Shaw describes the reconfigured value chain within the context of virtual markets for Real Estate services as Platform Real Estate, defining platforms as a basic technology or system used by multiple organisations. It helps bring different parties together for a shared goal or to solve a common issue. The more products, services, and users a platform has, the more valuable it becomes. Platforms gather various elements into temporary, larger groupings, enhancing the value of those elements and the platform itself (Shaw, 2020:1046).

In the service industry context, virtual markets are particularly suited for the trade in information goods. Picture a buyer stepping into the web to seek the best price for a future service purchase. They choose a Value Web or Platform, explore options, make the purchase, and then exit the web. When another service need arises, the same web constellation awaits their return.

The platforms efficacy hinges on interactivity. The more interactive it is, the more refined and perfected the electronic market becomes. However, it's crucial to consider the buyer's willingness to engage. These interactive services have revolutionised how businesses connect with buyers and suppliers in several markets offering personalised information tailored to individual needs.

Platforms offer a departure from traditional structures, enabling flexibility and fluidity in the market. As buyers and sellers enter this interactive realm, they gain access to expertise and guidance that can streamline transactions, reduce costs, and save valuable time. However, it's essential to weigh the costs, such as broker commissions, against the benefits provided by the platform's expertise and guidance.

Summary

In conclusion, this literature review has sought to provide a robust foundation for further inquiry into the evolving landscape of Real Estate brokerage, particularly considering technological advancements that challenge traditional industry norms. Starting from foundational economic theories like Transaction Cost Economics (TCE), a comprehensive understanding of the inherent complexities and dynamics within Real Estate markets has been developed, leading to a critical juncture where technology threatens to disrupt the traditional role of intermediaries.

The exploration of the transactional mechanisms, market frictions, and the role of intermediation in Real Estate markets has underpinned the problem statement. As technology erodes the information asymmetry traditionally enjoyed by brokers, there is an impetus for buyers and sellers to derive more value from intermediation. Specifically, the areas of Information Search and Transaction Management offered by brokers must be enhanced to ensure that brokerage fees continue to be perceived as providing value for money.

The review culminates by defining the concepts of Information Search and Transaction and developing a conceptual model which identifies the moderating variables influencing the degree to which Information Search and Transaction Management are valued by consumers of Real Estate services. The model illustrates that Real Estate fin tech platforms that influence these moderating variables are likely to have a disintermediation effect on traditional Real Estate brokerage. Similarly, the model proposes broker strategies which influence the moderating variables are likely to improve the perceived value of services provided by brokers.

The research questions derived from this review explore the services provided by brokers, the influence of technology on buyers' and sellers' perceptions of value, and the elements of Information Search and Transaction Management most valued by clients. Additionally, these questions delve into the strategies brokers can employ to distinguish themselves in a market increasingly influenced by technology. These questions remain rooted in our analysis of market dynamics, transactional frictions, the role of brokers, and the impact of technological advancements.

The research aim is also in line with the scope and insights provided by this review. The aim to investigate key elements of Information Search and Transaction Management in Real Estate transaction intermediation and to identify strategies for brokers to differentiate their services is backed by the examination of the complexities of the Real Estate market, the benefits and challenges of intermediation, and the impact of technology.

Finally, the research hypothesis corroborates with the concluding insights about technology's transformative rather than destructive potential within the Real Estate sector. To remain competitive in this technology-driven market, the proposition argues that brokers must enhance their offerings in Information Search and Transaction Management.

The outcomes of this literature review underscore the necessity and relevance of the stated problem, research questions, aim, and proposition. A rigorous theoretical backdrop has been created against which the proposed empirical investigation can take place. The inquiry points towards an industry on the brink of transformation, where the ability to adapt and innovate will distinguish successful Real Estate brokers in the era of digital disruption.

3. Research methodology

Introduction

This research aims to investigate the key elements of Information Search and Transaction Management in the context of Real Estate transaction intermediation, and to identify effective strategies for brokers to differentiate their services and compete in an increasingly technology-driven market. The hypothesis underlying this research is that to thrive in an increasingly technology-driven Real Estate market, brokers must enhance the provision of Information Search and Transaction Management services. The purpose of this research is to gain insight into the value ascribed to key elements of intermediated information search and transaction management in the context of residential Real Estate by consumers and how brokers might maintain or improve their perceived value by adopting strategies that enhance the provision of the most valuable elements. This research is motivated by the concern that advances in technology have eroded the traditional information asymmetry enjoyed by brokers, resulting in a need for buyers and sellers to derive increased value from intermediation, specifically Information Search and Transaction Management, offered by brokers to ensure that brokerage fees continue to be perceived as value for money (Agarwal et al., 2019; Glumac, Herrera-Gomez & Licheron, 2019; Larceneux, Lefebvre & Simon, 2015; Levitt, Steven D. & Syverson, 2008; Levitt, Steven D & Dubner, 2014; Wiese, 2013). To address the primary hypothesis, following sub-hypotheses are tested:

H5. The primary services provided by Real Estate brokers in the context of Information Search and Transaction Management have evolved in response to advances in technology.

H6. Advances in technology have affected buyers' and sellers' perceptions of the value of brokerage services in Real Estate transactions.

H7. Specific elements of Information Search and Transaction Management are valued more than others by buyers and sellers in Real Estate transactions and contribute to their perceived value of brokerage services.

H8. Strategies can be employed by Real Estate brokers to differentiate themselves and compete in an increasingly technology-driven market that are effective in terms of attracting and retaining clients.

The balance of this chapter is devoted to describing the research approach and design adopted in this study including the following:

- Conceptual Model
- Research Approach & Strategy
- Research Design, Data Collection Methods, and Research Instruments
- Sampling
- Research Criteria
- Data Analysis Methods
- Limitations

Conceptual Model

The relationship between the variables influencing the value of information search services, transaction management services, and ultimately the value of Real Estate intermediation services whether provided by the traditional Real Estate broker or through Real Estate fin tech platforms is depicted in Figure 4 below. The model is summarised as follows:

- The perceived value of information search services to consumers is influenced by the following variables:
    - The degree of perceived risk ascribed to transaction uncertainty by consumers.
    - The degree of perceived market knowledge possessed by consumers.
    - The degree to which consumers perceive Real Estate transactions to be complex.
- The perceived value of transaction management services to consumers is influenced by the following variables:
    - The degree to which consumers perceive a transaction to be complex.
    - The degree of potential information asymmetry between a potential buyer and seller
    - The degree of Real Estate transaction experience
- In order to complete in an increasingly technology driven market, successful Real Estate brokers will need to employ strategies aimed at increasing the perceived ability of brokers to cost effectively navigate transaction uncertainty, improve market knowledge, maximise the perceived (or actual) complexity of Real Estate transactions, and increase the perceived (or actual) ability of brokers to mitigate information asymmetry hazards arising from asset specificity and behavioural uncertainty (Williamson, Oliver E., 1989). The relative success of Real Estate brokers is moderated by both their experience and the potential of the localised market within which they operate.

- Real Estate fin tech platforms that are capable of reducing the perceived risk ascribed to transaction uncertainty, improving market knowledge, minimising the perceived complexity of Real Estate transactions, and mitigating information asymmetry hazards arising from asset specificity and behavioural uncertainty (Williamson, Oliver E., 1989) in a cost effective manner are likely to diminish the perceived value of Real Estate brokers and have a disintermediation effect on the traditional Real Estate brokerage industry.
- With enhanced information search, buyers are empowered to make informed decisions regarding property values, market trends, and negotiation strategies. They can accurately assess the suitability of properties, leading to more efficient property searches and selections that align with their preferences. On the other hand, sellers benefit from improved understanding of market dynamics and properties can be strategically positioned for maximum exposure and perceived value. Additionally, proficient transaction management ensures smoother and faster transactions, reducing the stress and uncertainty (friction) associated with complex legal and financial processes. Effective transaction management leads to favourable terms for both parties, enhancing the overall outcomes of transactions. Ultimately, the synergy between improved information search and transaction management results in a Real Estate landscape that is more transparent, efficient, and rewarding for all stakeholders involved.

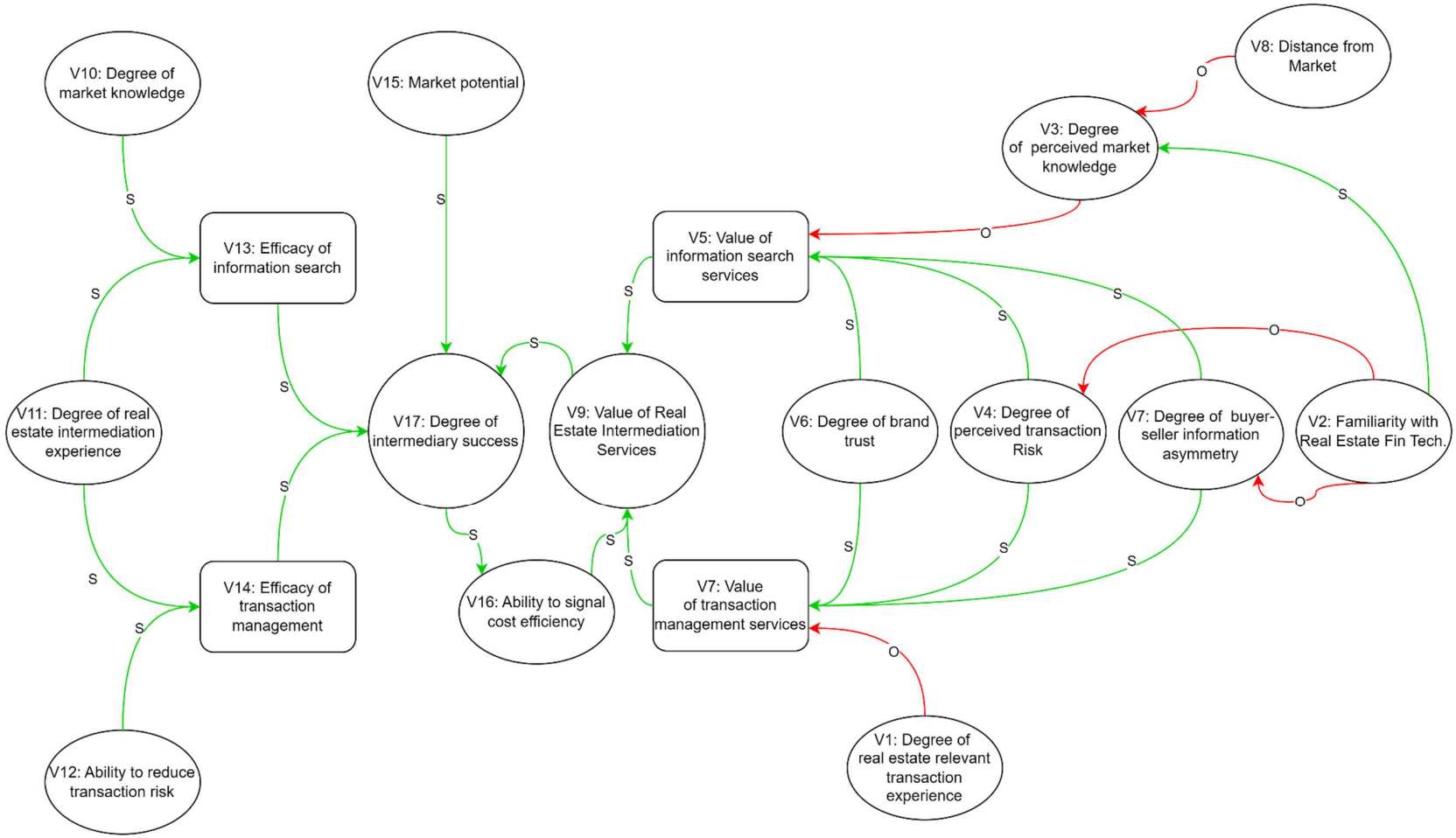

Figure 4 Conceptual Model: Variables influencing the value of Real Estate intermediation services.

Research Approach & Design

This research is conducted through a postpositivist lens, adopting a deductive approach, thus combining the critical, reflective stance of post-positivism regarding the nature of knowledge and the role of the researcher with the structured, theory-driven methodologies typical of deductive reasoning.

Creswell & Creswell (Creswell & Creswell, 2018:45), quoting Phillips and Burbules (2000), summarise the key assumptions of post positivism as follows:

> *1. Knowledge is conjectural (and antifoundational)—absolute truth can never be found. Thus, evidence established in research is always imperfect and fallible.*
>
> *2. Research is the process of making claims and then refining or abandoning some of them for other claims more strongly warranted.*
>
> *3. Data, evidence, and rational considerations shape knowledge.*
>
> *4. Research seeks to develop relevant, true statements, ones that can serve to explain the situation of concern or that describe the causal relationships of interest.*
>
> *5. Being objective is an essential aspect of competent inquiry; researchers must examine methods and conclusions for bias.*

Borrowing from Williamson (Williamson, Oliver E., 1989) quoting Solow (1985), through this lens, this research seeks to organise our necessarily incomplete perceptions about the market for Real Estate services, to see linkages that the untutored eye would miss, to tell plausible.., causal stories with the help of a few central principles, and to make rough quantitative judgments about the consequences of economic policy and other exogenous events.

While the combination of post-positivism and deductive reasoning seeks to provide rigorous, empirical insights into social phenomena, it has its limitations, particularly regarding flexibility, depth of understanding, and potential biases. The deductive approach, especially when combined with quantitative methods, might not delve deeply into the complexities and nuances of human experiences. While it may offer breadth, it might sacrifice depth. In addition, since deductive research is theory-driven, it's often confined to the conceptual boundaries of the existing theory. New, emergent, or unexpected phenomena might be ignored or dismissed. Allied to this is the potential for incorporating biases originating in the foundational theories into the current research (Creswell & Creswell, 2018; Ryan, 2006).

Research Design, Data Collection Methods, and Research Instruments

In terms of design, a review of the relevant literature reveals that mixed methods research designs are prevalent in this field (Crowston, Sawyer & Wigand, 2015; Larceneux, Lefebvre & Simon, 2015; Saber & Messinger, 2010). These designs have been employed to develop research instruments through qualitative methods which are then used to test hypotheses quantitatively, which allows for a comprehensive exploration of the research questions.

With qualitative and quantitative approaches representing different ends on a continuum with studies tending to be more qualitative than quantitative or vice versa (Creswell & Creswell, 2018). This research follows the approach adopted by Schmidt (Schmidt, 2022). This research employs a predominantly quantitative research design, making use of two cross-sectional survey instruments to assess the attitudes of both consumers and providers of Real Estate services towards Information Search and Transaction Management services together with the impact of technology on the perceived value of these services.

The survey instruments (see appendix 1 and 2) were developed by combining, adapting, and extending previously developed survey instruments, particularly those of Larceneux et al (Larceneux, Lefebvre & Simon, 2015), Saber & Messinger (Saber & Messinger, 2010) and Crowston et al (Crowston, Sawyer & Wigand, 2015). The consumer survey consists of a total of 29 items whilst the broker survey consists of 28 items. The consumer and broker surveys include 19 and 15 Lickert scale questions respectively utilising the Lickert scale response anchors developed by Vagias (Vagias, 2006). The consumer survey includes 4 demographic questions and a single qualitative question for a total of 29 items. Similarly, the broker survey includes 5 demographic questions and three qualitative questions for a total of 23 items. The rationale underpinning the validity of each survey item is detailed in the relevant appendix item. Where possible items with established content, concurrent, and construct validity were included in the survey instruments. In those instances where an items validity has not been previously established, the theoretical rational for inclusion is supported by the indicated reference.

The consumer survey (appendix 1) is designed to test hypotheses 2 & 3, whist the broker survey (appendix 2) is designed to test hypotheses 1 & 4. Both survey instruments were delivered using the Typeform online survey tool due to the relatively low cost, the ability to rapidly distribute the survey via email and social media channels, and the reduced risk of data entry errors (Creswell & Creswell, 2018).

Sampling

There are two target populations for this study. First, the Real Estate services consumer population consisting of people living in South Africa 18 years of age or older as they are most likely to engage in the market for Real Estate space and therefore Real Estate services. According to Statistics South Africa this

population is estimated to consist of approximately 40 million individuals (StatsSA, 2022). However, it must be acknowledged that South Africa's labour force participation rates are particularly low (see Table 1 Labor force participation rate in South Africa 2019-2022, by age group (StatsSA, 2022b)) thus the number of individuals engaging in the formal market for Real Estate services is likely to be considerably lower. But employment is not a prerequisite for participation in the market for Real Estate services.

Labor force participation rate in South Africa 2019-2022, by age group

	15-24 years	25-34 years	35-44 years	45-54 years	55-64 years	
Q1 2019	24.80	73.50	79.20	74.70	43.70	in %
Q2 2019	26	74	80.40	75.30	45.30	in %
Q3 2019	25.60	74.40	80.90	75.50	44.50	in %
Q4 2019	26.20	74.10	80.20	75	44.50	in %
Q1 2020	27.20	74.50	80.50	75.40	44.70	in %
Q2 2020	15.70	56.50	66.10	64.70	38.40	in %
Q3 2020	20.10	67.20	74.30	70.10	41.80	in %
Q4 2020	20.60	71.10	77.10	73.30	42.70	in %
Q1 2021	20.60	69.90	77.80	72.70	42.20	in %
Q2 2021	22.90	71.40	77.70	73.50	42.20	in %
Q3 2021	21.70	67.40	75.80	71.50	39.40	in %
Q4 2021	22.70	69.60	76.80	72.40	38.70	in %
Q1 2022	24.90	69.50	76.90	72.20	38.60	in %
Q2 2022	26.60	72.10	77.70	73.60	40.20	in %
Q3 2022	25	71.20	78.20	73.50	39.60	in %
Ave. Participation Rate	23.37	70.43	77.31	72.89	41.77	in %

Table 1 Labor force participation rate in South Africa 2019-2022, by age group (StatsSA, 2022b)

Random sampling was employed using a Facebook advert run over a period of twenty-eight days targeting Facebook users in South Africa that are 18 years of age or older. Zhang et al (Zhang et al., 2020) find that population samples recruited using Facebook advertisements "is a viable option for survey researchers wishing to approximate population-level public opinion." (Zhang et al., 2020:588) although they caution that the algorithm employed by Facebook to drive traffic to a website, in this case a survey link, contains a feedback mechanism that isolates the characteristics of Facebook users who have responded to the advert and then targets users with similar characteristics with the advert. This results in the sample potentially becoming increasingly less random.

An ideal sample size of this population, based on Cochran's sample size formula, with a confidence level of 95% and a 5% margin of error would require 385 respondents. However, given time and resource constraints together with the limited extent to which a claim or decision will be made based on the analysis a smaller sample size is justified. In addition, despite a smaller sample size, this study has the potential to contribute to further meta-analysis research (Lakens, 2022). This is supported by Schmidt's (Schmidt,

2022) study which achieved a confidence level of 90% with a 7% margin of error based on a European population of 450,000,000 in 2021 (Eurostat, 2021).

The population of individuals offering residential Real Estate services operating in South Africa is the second target population. This population is estimated to consist of between 30,000 and 83,000 individuals (Govender, 2017; PPRA, 2023; REBOSA, 2018). Two approaches were used to recruit a random sample of the target population, first a list of prominent South African residential Real Estate brokerages was compiled, offices or franchises for each brand located in major population centres were selected and the brokerage manager together with a random selection of up to three brokers were made if their email address was publicly available. A total of 395 invitations to participate in the survey were emailed. Second, a Facebook search was conducted for both public and private groups who principal purpose was for the engagement of Real Estate brokers, a total of 10 groups were identified and a post inviting potential participants to complete the survey was made. It is possible that participants in these groups are not Real Estate brokers. The primary reasons for adopting this approach were to achieve a statistically significant, demographically diverse sample, in a relatively short period of time, and in a cost-effective manner.

An ideal sample size of the Real Estate Broker population, based on Cochran's sample size formula, with a confidence level of 95% and a 5% margin of error would require 383 respondents. Schmidt's (Schmidt, 2022) study achieved a confidence level of 70% with a 7% margin of error based on a population of 350,000 Real Estate professionals (CEPI, 2023). Given the time and resource constraints, together with the limited extent to which a claim or decision will be made based on the analysis, a sample size smaller than indicated using Cochran's formula is justified as it has the potential to contribute to further meta-analysis research (Lakens, 2022).

Data Analysis Method

Descriptive statistical analysis and data management was conducted using IBM© SPSS© Statistics software version 28 for Windows.

Data Cleaning

To preserve as many cases as possible, imputation of missing data with an estimated value based on other available responses from respondents in both surveys was the preferred approach failing which responses were deleted.

The postcodes provided by consumer respondents are converted to an average transaction value for the postcode suburb. This is done by cross-referencing the postcode with the South African Post Office (SAPO) Postcode reference file (SAPO, 2023) to determine the suburb and then calculating the average transaction

value for the suburb based on the Property24 (Property24, 2022) freehold and sectional title sales data for 2022. This provides a relative socio-economic indicator for consumer comparison. The underlying assumption being that those consumers residing in more affluent areas are more likely to have more exposure to and or more experience relevant to information search and transaction management. For ease of analysis, the average transaction values are recoded from a continuous measure to an ordinal measure by grouping values into value bands using the approach adopted by the FNB Property Barometer (Mkhwanazi, Mano & Ambaram, 2023). In addition, the SAPO Postcode reference file details the province within which the postcode falls allowing for the determination of the respondent's province.

Similarly, postcodes related to areas of operation provided by broker respondents are converted to a suburb and sales data for the suburb provides an indication of market size and activity from which the average transaction value for the area of operation can be calculated. Applying an average commission rate of 6% (Rousseau, 2023) to the average transaction value and comparing the average commission per transaction to the average monthly earnings provides an indication of the relative success of the broker respondents, the assumption being that broker success is determined by the number of transactions concluded for a given level of earnings. To calculate a success score per respondent, the upper and lower earnings anchors are divided by the average commission (Average Transaction value * 6%) and the result divided by 2. Where the respondent selected "Less than R4000" or "More than R128,000" the success score is determined by dividing the earnings anchor by the average commission (Average Transaction value * 6%) only. In addition, the brokers residential postcode is compared to the operational postcodes to determine whether the broker resides in an area of operation.

The Industry (Q2), and Occupation (Q3) consumer survey items are recoded to from a nominal measure to an ordinal measure by subjectively ranking (see Table 1) the items in terms of their relative likelihood of exposure to and or more experience relevant to information search and transaction management.

Industry	Rank		Occupation	Rank
Accommodation and food service activities	4		Clerical support	4
Financial and insurance activities	8		Elementary occupations	2
Human health and social work activities	3		Manager	7
Manufacturing	5		Professional	6
Not elsewhere classified	1		Service and sales	3
Other service activities	2		Technicians and associate professional	5
Professional, scientific and technical activities	7		Unemployed	1
Wholesale and retail trade; repair of motor vehicles and motorcycles	6			

Table 2 Industry and Occupation Ranking

Similarly, the Age group survey item is recoded to from a nominal measure to an ordinal measure by ranking the groups from youngest to oldest. The underlying assumption being that the older a consumer the more likely they are to have more exposure to and or more experience relevant to information search and transaction management.

It is important to note that, for the purposes of this research, a key assumption is that the existence of information asymmetry between market participants exists and that as the Degree of buyer-seller information asymmetry (Variable 7, Figure 4) increases so does the value of transaction management services and by extension the value of Real Estate intermediation services.

Table 3 details the grouping of consumer survey question items to variables and Table 4 details the grouping of broker survey questions to variables.

Hypothesis	Element	Variable	Question
H2; H3	Transaction Management	V1: Degree of Real Estate relevant transaction experience	Q1; Q2; Q3; Q4; Q6
H2	Information Search/Transaction Management	V2: Familiarity with Real Estate Fin Tech	Q7; Q19; Q13
H2; H3	Information Search / Transaction Management	V4: Degree of perceived transaction risk	Q23
H2; H3	Information Search	V5: Value of information search services	Q8; Q12; Q16; Q21; Q22; Q24; Q25
H2; H3	Information Search	V6: Degree of brand trust	Q15
H2; H3	Transaction Management	V6: Degree of brand trust	Q10
H2; H3	Transaction Management	V7: Value of transaction management services	Q9; Q11; Q18; Q20
H2; H3	Information Search	V8: Distance from Market	Q17
H2	Intermediation Services	V9: Value of Real Estate intermediation services	Q8; Q12; Q16; Q21; Q22; Q24; Q25; Q9; Q11; Q18; Q20

Table 3 Consumer survey item to variable mapping

Hypothesis	Element	Variable	Question
H1	Information Search	V10: Degree of market knowledge	Q6; Q11; Q14; Q16
H1;H4	Transaction Management / Information search	V11: Degree of Real Estate intermediation experience	Q1; Q2
H1	Transaction Management	V12: Ability to reduce transaction risk	Q13; Q21; Q22
H1	Information Search	V13: Efficacy of information search	Q7; Q8; Q10; Q12; Q19
H1	Transaction Management	V14: Efficacy of transaction management	Q17; Q20; Q23

Table 4 Broker survey item to variable mapping

Descriptive Analysis

The frequencies and percentages are calculated for all categorical demographic items, whilst the mean, median, mode, and standard deviation are provided for all continuous demographic items.

The mean and median are calculated for each Likert scale items to understand the central tendency. In addition, the standard deviation is calculated to understand the spread and finally the frequencies and percentages are calculated for each scale point to know the distribution of responses.

Likewise, the score for each variable concept per respondent is determined by calculating the mean of the constituent Lickert items and recoded demographic item scores. The mean and median are calculated for each variable to understand the central tendency. In addition, the standard deviation is calculated to understand the spread and finally the frequencies and percentages are calculated for each scale point to know the distribution of responses.

In those instances where multiple Lickert scale items together with demographic item are intended to measure a single underlying variable concept the reliability of these variables is assessed using Cronbach's Alpha to measure the internal consistency of the items, with an optimal value being between 0.7 and 0.9 (Creswell & Creswell, 2018). However, Pallant and Manual (Pallant & Manual, 2011) quoting Briggs and Cheek (1986) advises that due to Cronbach values being sensitive to the number of items in the scale, with shorth scales returning low values, it may be more appropriate to report the mean inter-item correlation with an optimal range of .2 to .4.

It is worth noting that combining Likert items assumes that the distance between response options is equal (i.e., the distance between "Strongly Disagree" and "Disagree" is the same as between "Disagree" and "Neutral"). This is a debatable assumption, and some statisticians advocate treating Likert items as ordinal rather than interval data. However, in many fields, treating them as interval data and combining them into composites is standard practice whilst others propose calculating z-scores in order to perform mathematical operations (Anjaria, 2022).

To investigate the relationships between the concept variables Spearman Rank Order (Spearman rho) correlation and partial correlation analysis is applied (Creswell & Creswell, 2018; Pallant & Manual, 2011).

Finally, whilst more comprehensive statistical analysis techniques could be applied to gain further insight, these are beyond the scope of this research.

Summary

In summary, the methodology adopted for this research firmly anchors itself within the postpositivist paradigm, combining a structured, theory-driven deductive approach with quantitative research design. This choice of approach aims to achieve empirical rigor and generate insights that can be inferred to the larger Real Estate market in South Africa. Leveraging both primary and secondary sources, such as the cross-sectional digital survey instruments and comprehensive literature reviews, this research seeks to comprehend the perspectives of consumers and providers within the Real Estate service domain.

In aligning with Creswell & Creswell's (Creswell & Creswell, 2018) insights on post positivism, the research acknowledges the inherent limitations of human knowledge, emphasising the role of evidence, rational considerations, and objectivity in forming competent inquiries. This echoes the sentiments of Williamson (Williamson, Oliver E., 1989), wherein the study aims to organise perceptions about the Real Estate market, discerning linkages and making rough quantitative judgments.

Acknowledging prevalent mixed method designs in Real Estate research, this study opted for a predominantly quantitative research design. This decision was informed by the need for breadth in understanding the market dynamics but is conscious of the potential sacrifice in depth. The research instruments, which were diligently adapted and refined from prior instruments, aim to gauge the attitudes of both consumer and provider stakeholders.

Given the vastness of the target population, strategic sampling methods were utilised to achieve adequate sample sizes. The use of Facebook and email campaigns for sampling showcases the blend of traditional and modern methods to achieve a diverse sample that aims to represent the broader demographics of South Africa's Real Estate market. Recognising the inherent biases and constraints in this methodology, this research has put forth its best efforts to remain objective and empirical.

With suitable data cleaning, the research emphasises the importance of accuracy and authenticity in its findings.

While every methodology has its strengths and limitations, the current research offers a structured, empirical lens to a vast, complex market. The hope is that future research can build upon these foundations, diving deeper into nuances and further enriching our understanding of the Real Estate landscape in South Africa.

4. Research Findings, Analysis and Discussion

Introduction

This section is structured to first present the empirical data collected through the consumer and broker surveys beginning with the consumer survey. The findings are interpreted to offer a clear view of the current state of the industry and the evolving role of technology within it.

A methodical approach is adopted, employing descriptive statistics and regression analysis to quantify and contextualise the relationship between technological familiarity and the value perception of brokerage services. The data is systematically analysed to uncover underlying trends and patterns, offering a nuanced understanding of the complex interplay between technology and Real Estate brokerage services.

Consumer Sample

The age and location demographics of those served with the advertisement promoting participation in the consumer survey (Annexure 1) are shown in Figure 5 whilst that of the target population are shown in Figure 6 and Figure 7. In comparison, the sample audience demographics closely resembles the target consumer population.

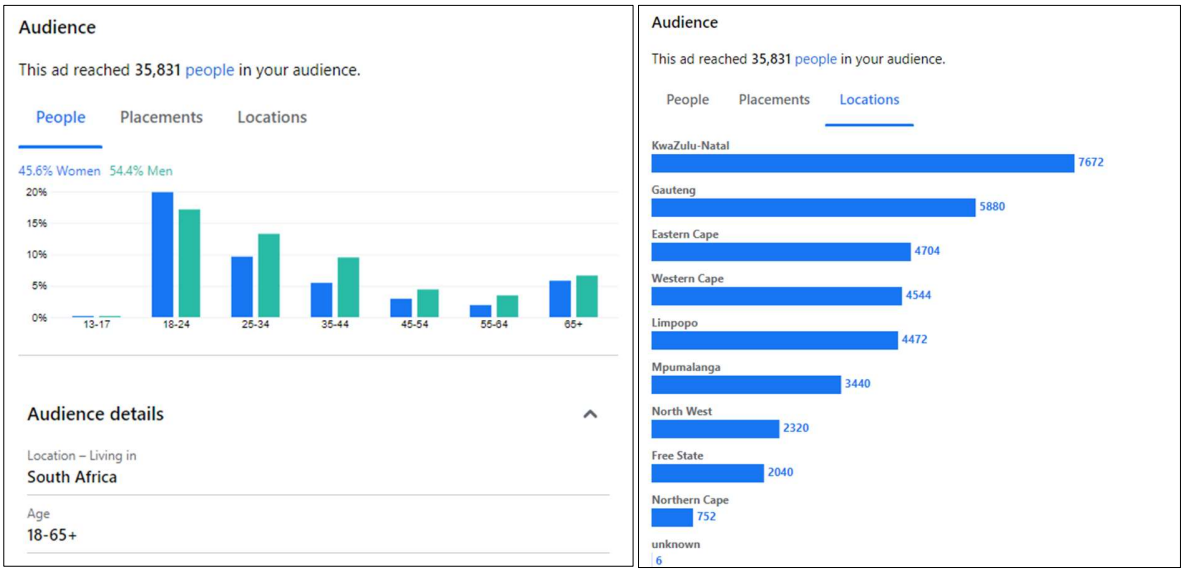

Figure 5 Facebook Consumer Survey Advertisement Audience

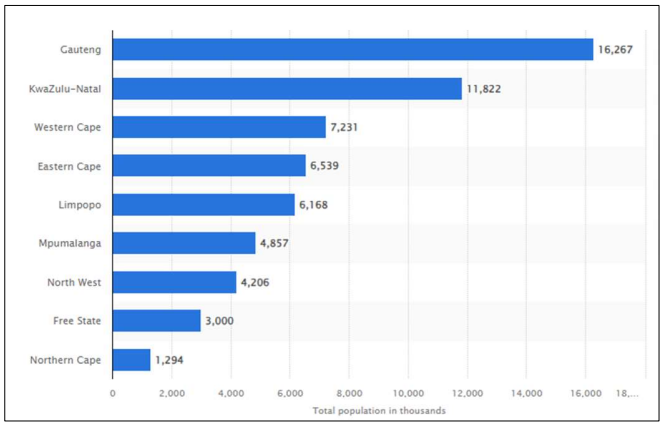

Figure 6 Total population of South Africa in 2022, by province (StatsSA, 2023).

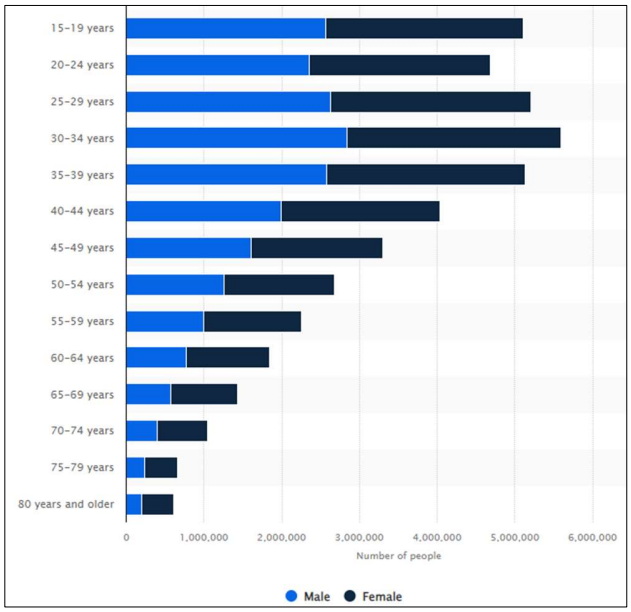

Figure 7 Population of South Africa in 2022, by age group and gender (StatsSA, 2022).

The survey was viewed a total of 439 times with 118 starts and 73 submissions for a completion rate of 61.86%. Applying Cochran's sample size formula, a sample size of 73 respondents equates to a confidence level of 90% with a 9.7% margin of error.

Several comments were received in response to the requests for participants indicating that potential participants may have perceived the advertisement to be for the provision of Real Estate services or that the use of Real Estate services was a prerequisite for engaging with the survey. This may have influenced the extent to which the sample is representative of the population.

In terms of categorical demographic variables Age Group, Industry, Occupation, Postcode, and Real Estate Transactions, all 73 respondents provided valid responses.

Figure 8 through Figure 12 detail the frequency and percentages calculated for the demographic variables Age Group, Industry, Occupation, Province, and Real Estate Transactions. Figure 13 details the mean, median, mode, and standard deviation of Average Transaction values as calculated from the respondent's postcode.

Age Group Distribution

	N	%
25-34	11	15.1%
35-44	15	20.5%
45-54	25	34.2%
55-64	13	17.8%
65+	9	12.3%

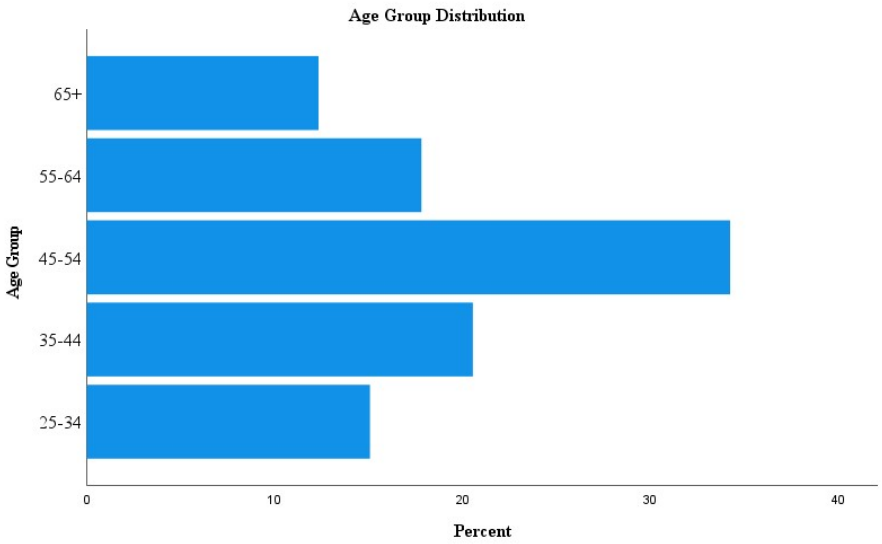

Figure 8 Age group distribution of consumer survey respondents.

Industry Distribution

	N	%
Accommodation and food service activities	3	4.1%
Financial and insurance activities	12	16.4%
Human health and social work activities	4	5.5%
Manufacturing	3	4.1%
Not elsewhere classified	14	19.2%
Other service activities	13	17.8%
Professional, scientific and technical activities	22	30.1%
Wholesale and retail trade; repair of motor vehicles and motorcycles	2	2.7%

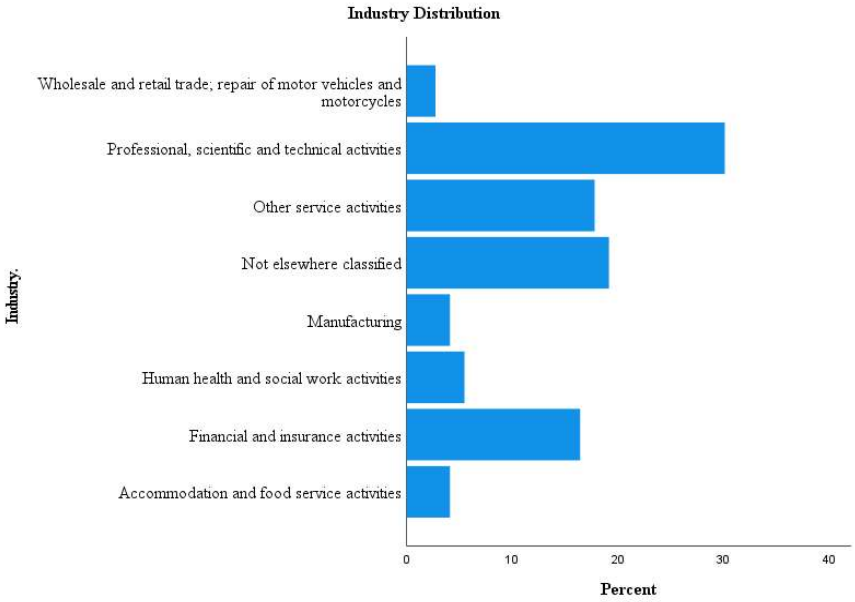

Figure 9 Industry group distribution of consumer survey respondents.

Occupation Distribution

	N	%
Clerical support	4	5.5%
Elementary occupations	1	1.4%
Manager	19	26.0%
Professional	26	35.6%
Service and sales	12	16.4%
Technicians and associate professional	3	4.1%
Unemployed	8	11.0%

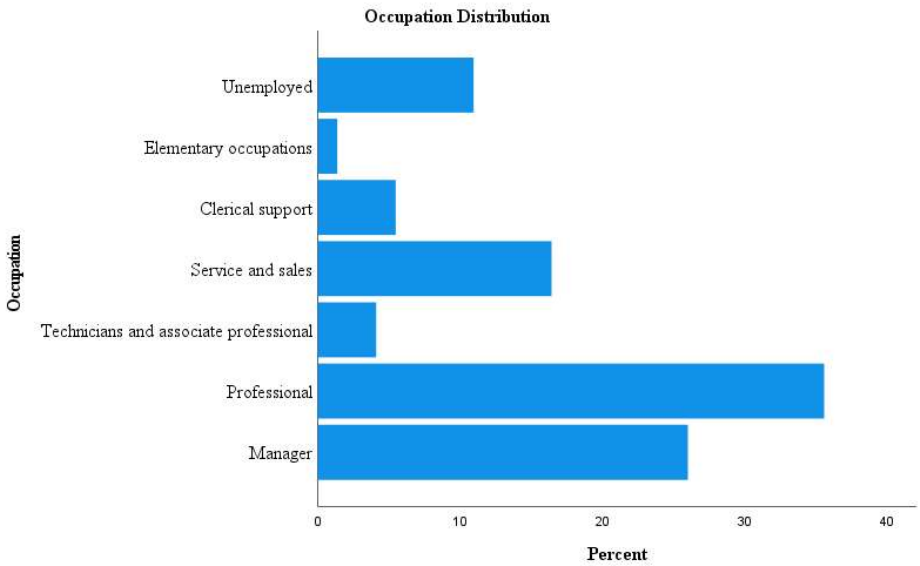

Figure 10 Occupation group distribution of consumer survey respondents.

Province

	N	%
Eastern Cape	2	2.7%
Free State	1	1.4%
Gauteng	23	31.5%
KwaZulu Natal	6	8.2%
Western Cape	41	56.2%

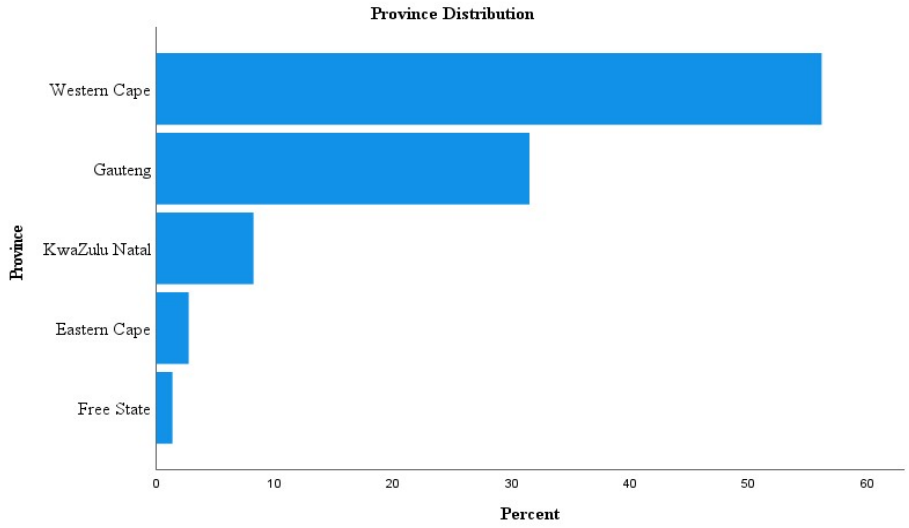

Figure 11 Provincial distribution of consumer survey respondents.

Real Estate Transactions

	N	%
0	3	4.1%
1	10	13.7%
2	16	21.9%
3	19	26.0%
4	10	13.7%
5	15	20.5%

Figure 12 Real Estate Transaction group distribution of consumer survey respondents.

Average 2022 Transaction Value		
N	Valid	73
	Missing	0
Minimum		124,922
Maximum		12,450,000
Mean		2,823,755.64
Median		2,245,054.95
Mode		2,455,237
Std. Deviation		2,858,398.068

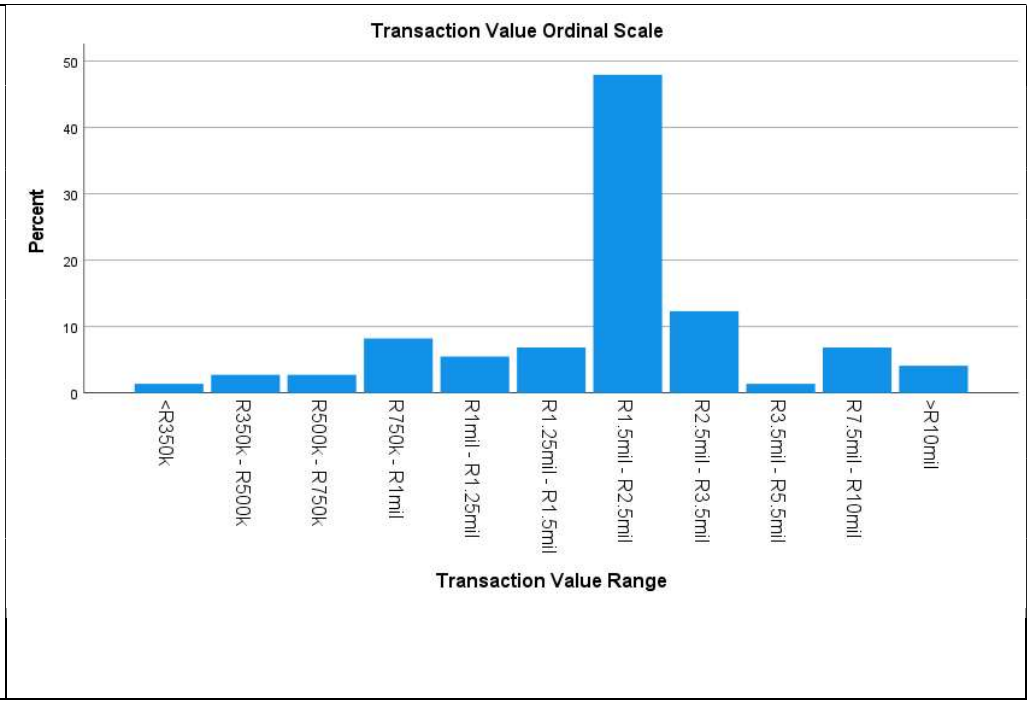

Figure 13 2022 Average transaction value distribution.

In terms of the Likert scale items, 4 cases were identified where responses to question 9 - Please rate from 1 (Not Important) to 5 (Extremely Important), how much do you feel an agent's guidance on the legal and financial aspects of a Real Estate transaction would be valuable? – had been omitted (See Table 5). The missing values were imputed based on the pooled output of 5 imputations generated using logistic regression model utilising the remaining Likert scale items for which responses had been received as predictive inputs. The results of the imputed data are shown in Table 6.

Original data					
	N				
	Valid	Missing	Mean	Median	Std. Deviation
Q7	73	0	3.59	4.00	1.267
Q8	73	0	4.66	5.00	.671
Q9	69	4	3.78	4.00	1.149
Q10	73	0	3.23	3.00	1.264
Q11	73	0	3.74	4.00	1.179
Q12	73	0	4.03	4.00	1.190
Q13	73	0	3.07	3.00	1.347
Q15	73	0	3.11	3.00	1.231
Q16	73	0	3.40	4.00	1.222
Q17	73	0	3.00	3.00	1.323
Q18	73	0	3.88	4.00	1.312
Q19	73	0	3.45	4.00	1.119
Q20	73	0	3.64	4.00	1.240
Q21	73	0	2.79	3.00	1.201
Q22	73	0	3.36	3.00	1.316
Q23	73	0	3.05	3.00	1.257
Q24	73	0	3.49	4.00	1.324
Q25	73	0	3.58	4.00	1.212
Q26	73	0	6.88	7.00	2.236

Table 5 Distribution statistics for consumer survey Likert scale items with omitted data.

Pooled Imputation			
	N		
	Valid	Missing	Mean
Q7	73	0	3.59
Q8	73	0	4.66
Q9	73	0	3.72
Q10	73	0	3.23
Q11	73	0	3.74
Q12	73	0	4.03
Q13	73	0	3.07
Q15	73	0	3.11
Q16	73	0	3.40
Q17	73	0	3.00
Q18	73	0	3.88
Q19	73	0	3.45
Q20	73	0	3.64
Q21	73	0	2.79
Q22	73	0	3.36
Q23	73	0	3.05
Q24	73	0	3.49
Q25	73	0	3.58
Q26	73	0	6.88

Table 6 Distribution statistics for consumer survey Likert scale items with pooled imputed values for Q9.

The variables detailed in Table 3 and calculated as the mean value of the constituent survey items are described in Table 7.

Key Consumer Variables	N	Minimum	Maximum	Mean	Std. Deviation
V1 Degree of Real Estate relevant experience	73	2.40	7.40	5.2959	.98608
V2 Familiarity with Real Estate fin tech	73	2.00	5.00	3.3699	.81756
V3 Degree of perceived transaction risk	73	1.00	5.00	3.0548	1.25710
V4 Value of information search services	73	1.29	5.00	3.6145	.81743
V5 Degree of brand trust	73	1.00	5.00	3.1712	1.13106
V6 Value of transaction management services	73	1.33	5.00	3.6616	.98242
V8 Distance from market	73	1.00	5.00	3.0000	1.32288
V9 Value of Real Estate intermediation services	73	1.46	5	3.6354	0.87332

Table 7 Key consumer variable descriptive statistics.

Reliability and Validity

Table 8 details the results of the reliability testing of the consumer variables, the following observations are made regarding the reliability and validity of the key consumer variables:

V1 Degree of Real Estate relevant experience

Initial analysis revealed items Q2; Q3 are correlated r = 0.299 but are not correlated with items Q1; Q6; Q4. Item Q4 shows weak to negative correlation with all other items. Item Q1; Q6 are positively correlated r = 0.442.

V2 Familiarity with Real Estate fin tech

Initial analysis revealed items Q13; Q19 are correlated r = 0.339 but are not correlated with item Q7. Were item Q7 to be removed a Cronbach's alpha value of 0.499 would be realised.

V4 Value of information search services

The deletion of item Q8 from the variable would result in a Cronbach's alpha value of 0.850 being realised.

V9 Value of Real Estate intermediation services

The deletion of item Q21 from the variable would result in a Cronbach's alpha value of 0.928 being realised.

Key Consumer Variables	Items	Cronbach's Alpha	Inter-item Correlation
V1 Degree of Real Estate relevant experience	Q1; Q2; Q3; Q4; Q6	0.140	0.036
V2 Familiarity with Real Estate fin tech	Q7; Q19; Q13	0.335	0.142
V4 Value of information search services	Q8; Q12; Q16; Q21; Q22; Q24; Q25	0.819	0.356
V6 Degree of brand trust	Q10; Q15	0.783	0.644
V7 Value of transaction management services	Q9; Q11; Q18; Q20	0.883	0.558
V9 Value of Real Estate intermediation services	Q8; Q12; Q16; Q21; Q22; Q24; Q25; Q9; Q11; Q18; Q20	0.926	0.469

Table 8 Cronbach's alpha & Inter-item correlation values for key consumer variables.

In terms of validity, given the relatively small sample size, N= 73, the results of this research should be considered exploratory or tentative in nature.

Sub-hypothesis Testing

H2. Advances in technology have affected buyers' and sellers' perceptions of the value of brokerage services in Real Estate transactions.

As presented in Table 9, variable V2: Familiarity of Real Estate Fin Tech has a positive correlation with variable V9: Value of Real Estate intermediation services. The nature of this relationship is detailed in figure 20. It reveals that familiarity of Real Estate Fin Tech helps to explain approximately 20% of the variance in perceived value of Real Estate intermediation services and that the relationship is moderately positive. The strength of this correlation rises to 32% if item Q7 is excluded from the variable. Item Q7 displays a weak negative correlation with the value of Real Estate intermediation services. The availability of information on the internet and the ability of Real Estate brokers to employ technology to provide consumers with reliable and accurate information has a large impact on the perceived value of Real Estate brokerage services.

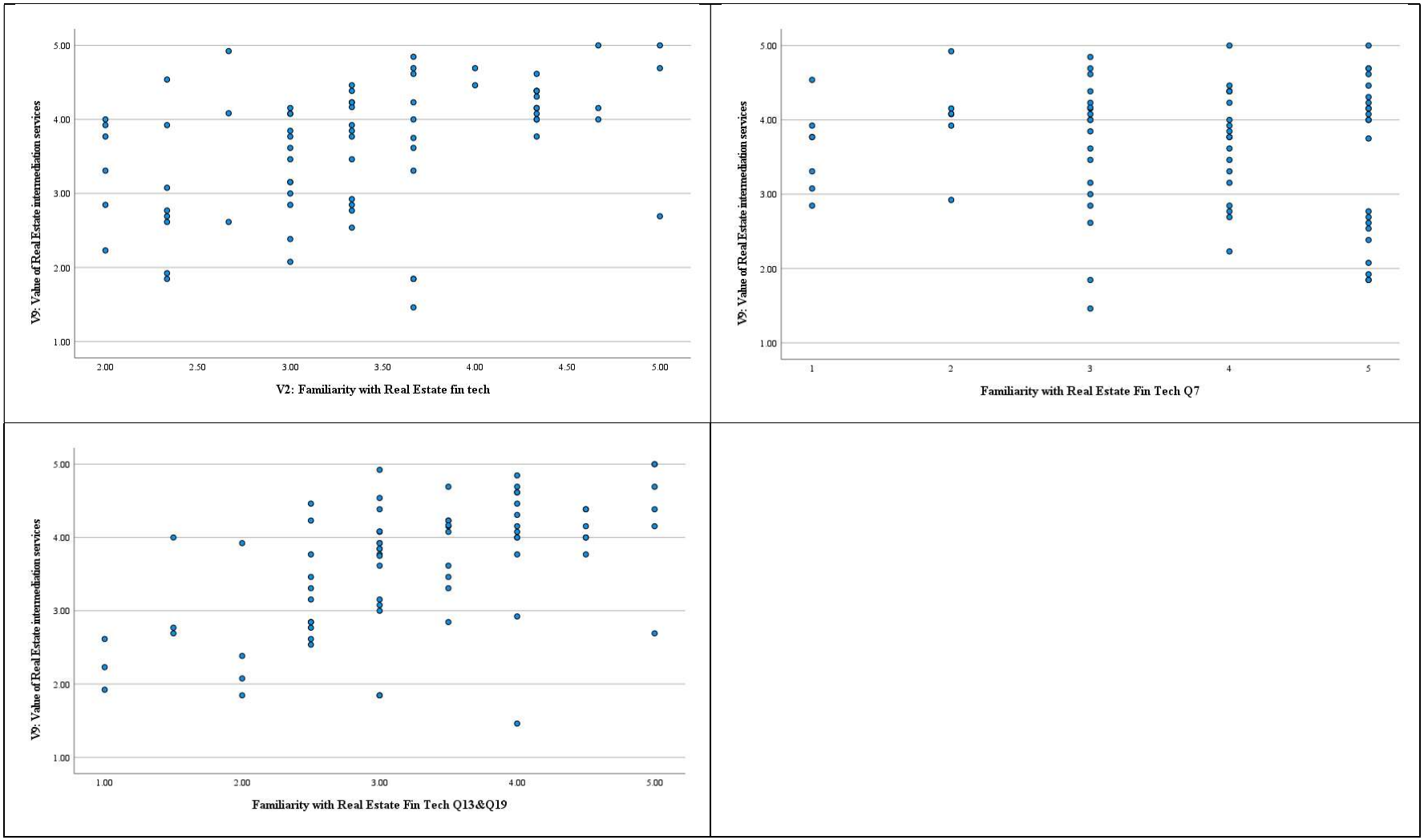

Figure 14 Scatter plots for Value of Real Estate Services and Familiarity with Real Estate Fin Tech

		V9: Value of Real Estate intermediation services	V2: Familiarity with Real Estate Fin Tech	Familiarity with Real Estate Fin Tech Q13 & Q19	Familiarity with Real Estate Fin Tech Q7
V9: Value of Real Estate intermediation services	Correlation Coefficient	1.000	.454**	.569**	-0.044
	Sig. (2-tailed)		0.000	0.000	0.709
	N	73	73	73	73
V2: Familiarity with Real Estate Fin Tech	Correlation Coefficient	.454**	1.000	.854**	.539**
	Sig. (2-tailed)	0.000		0.000	0.000
	N	73	73	73	73
Familiarity with Real Estate Fin Tech Q13 & Q19	Correlation Coefficient	.569**	.854**	1.000	0.065
	Sig. (2-tailed)	0.000	0.000		0.584
	N	73	73	73	73
Familiarity with Real Estate Fin Tech Q7	Correlation Coefficient	-0.044	.539**	0.065	1.000
	Sig. (2-tailed)	0.709	0.000	0.584	
	N	73	73	73	73
**. Correlation is significant at the 0.01 level (2-tailed).					

Table 9 Correlation between Value of Real Estate intermediation services and Familiarity with Real Estate Fin Tech.

H3. Specific elements of Information Search and Transaction Management are valued more than others by buyers and sellers in Real Estate transactions and contribute to their perceived value of brokerage services.

The correlation between V9: Value of Real Estate intermediation services and the constituent elements of V4: Value of Information search services and V7: Value of Transaction management services is detailed in figure 22. This analysis reveals that individual elements of Information Search and Transaction Management can explain relatively more of the overall movement in the Value of Real Estate intermediation services than others.

Standard multiple regression analysis was used to identify the relative contribution that each of the constituent elements make to the Value of Real Estate intermediation services and the standardised coefficients and semi partial correlation coefficients are provided in figure 23. The analysis indicates that the acumen and skill associated with negotiating ($\beta = 0.232$), evaluating offers, and formulating counteroffers ($\beta = 0.216$), make the two largest unique contributions to the value of Real Estate intermediation services. However, only 1.6% ($sr = 0.125)^2$ and 1.8% ($sr = 0.133)^2$ of the variation in the value of Real Estate intermediation services can be explained by variations in Q24 and Q16 respectively.

Matching preferences with appropriate properties (Q22) and Administrative tasks and coordination (Q18) make equivalent unique contributions (β = 0.118) whilst Q25 (β = 0.109), Q20 (β = 0.108), Q21 (β = 0.107), Q12 (β = 0.106), and Q11 (β = 0.105) make contributions within a close range.

Guidance on the legal and financial aspects (Q9) and Access to current market information (Q8), make the smallest unique contributions to the value of Real Estate intermediation services with values of β = 0.092 and β = 0.055 respectively.

That slightly less than 8 % of the variation in the value of Real Estate intermediation services can be explained by combined individual variations suggests that there is a significant degree of shared variance.

These results support Wigand's (Wigand, 2020) contention that

> *What appears to be happening is more interesting but also harder to model economically: the agent's role is changing to be more about process and less about search. In this role, agents work with buyers and sellers to make the process more transparent by explaining what all the pieces of the transaction mean, helping to arrange value adding services, and keeping everything moving. And, as anyone who has a spouse can attest, they often do a fair bit of financial counselling. Marriage counselling, social and professional networking and hand-holding, all services that are very difficult to replace with a Web page (Wigand, 2020:43).*

			V9	Q8	Q21	Q11	Q12	Q22	Q9	Q18	Q16	Q20	Q25	Q24
Spearman's rho	Value of Real Estate intermediation services	Correlation Coefficient	1.000	0.076	.558**	.618**	.643**	.656**	.748**	.765**	.775**	.806**	.809**	.831**
		Sig. (2-tailed)		0.526	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		N	73	73	73	73	73	73	73	73	73	73	73	73
Elements of Information Search and Transaction Management				Access to current market information	Obtaining accurate information about property prices, market trends, or neighbourhood conditions	Ability to connect you with other professionals	Expert guidance about the buying or selling process	Matching your preferences with appropriate properties	Guidance on the legal and financial aspects	Administrative tasks and coordination	Expertise for evaluating property offers, formulating counteroffers, and negotiation	Reduces the stress and emotional burden	Managing uncertainties and risks	Negotiation skills

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

*. Correlation is significant at the 0.05 level (2-tailed).

Table 10 Value of Real Estate intermediation services item correlation table.

	Standardised Coefficients Beta	Sig.	Correlations			Elements of Information Search and Transaction Management
			Zero-order	Partial	Part	
(Constant)		0.169				
Q24	0.232	0.000	0.859	0.981	0.125	Negotiation skills
Q16	0.216	0.000	0.790	0.984	0.133	Expertise for evaluating property offers, formulating counteroffers, and negotiation
Q22	0.118	0.000	0.699	0.955	0.079	Matching preferences with appropriate properties
Q18	0.118	0.000	0.777	0.955	0.079	Administrative tasks and coordination
Q25	0.109	0.000	0.854	0.919	0.057	Managing uncertainties and risks
Q20	0.108	0.000	0.768	0.938	0.066	Reducing the stress and emotional burden
Q21	0.107	0.000	0.552	0.962	0.086	Obtaining accurate information about property prices, market trends, or neighbourhood conditions
Q12	0.106	0.000	0.676	0.952	0.076	Guidance about the buying or selling process
Q11	0.105	0.000	0.639	0.956	0.079	Ability to connect with other professionals
Q9	0.092	0.000	0.826	0.899	0.050	Guidance on the legal and financial aspects
Q8	0.055	0.000	0.100	0.899	0.050	Access to current market information

a. Dependent Variable: Value of Real Estate intermediation services

Table 11 Standard Multiple Regression to determine relative contribution of Information Search and Transaction management element to the Value of Real Estate intermediation services.

Broker Sample

The survey was viewed a total of 50 times with 29 starts and 18 submissions for a completion rate of 62.07%. Applying Cochran's sample size formula, a sample size of 18 respondents is equates to a confidence level of 70% with a 12.3% margin of error. Given the relatively small broker ample size the following analysis and findings should be considered exploratory in nature. All 18 respondents provided valid responses to all survey items.

Figure 15 through figure 18 detail the frequency and percentages calculated for the demographic variables Province, Education, and Real Estate Tenure. Figures 19 and 20 detail the mean, median, mode, and standard deviation of Average Transaction values and the Success Score respectively. All respondents provided residential postcodes that were also included in their three operating postcodes.

Province

	N	%
Eastern Cape	1	5.6%
Free State	1	5.6%
Gauteng	7	38.9%
KwaZulu Natal	2	11.1%
Mpumalanga	1	5.6%
Norther Cape	1	5.6%
Western Cape	5	27.8%

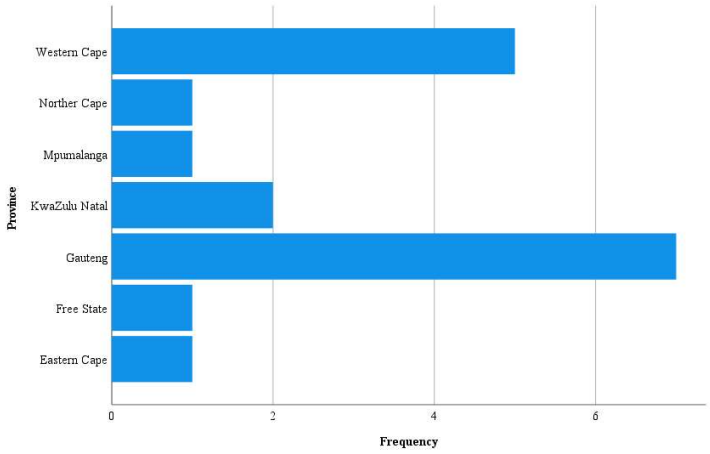

Figure 15 Broker Distribution by province

Education Distribution

	N	%
NQF 4	3	16.7%
NQF 5	5	27.8%
NQF 6	2	11.1%
NQF 7	2	11.1%
NQF 8	2	11.1%
NQF 9	4	22.2%

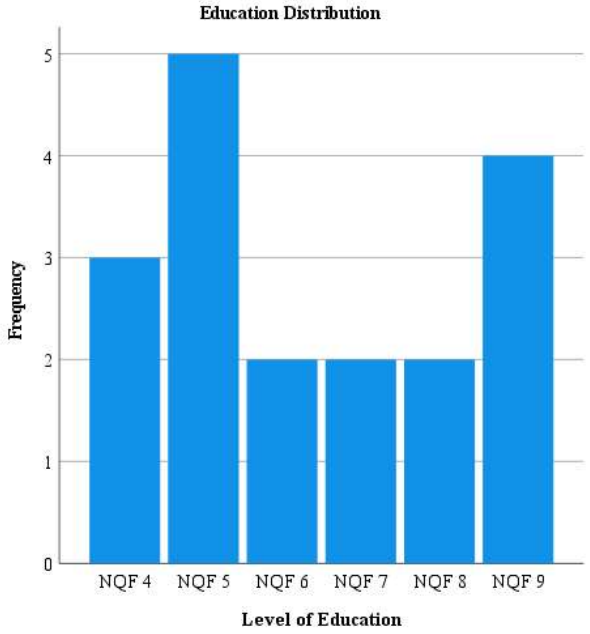

Figure 16 Broker education distribution

Real Estate Tenure

	N	%
'+10 - 15 years	1	5.6%
'+15 - 20 years	6	33.3%
'+3 - 5 years	1	5.6%
'+5 - 10 years	2	11.1%
1 - 3 years	2	11.1%
Less than 1 year	2	11.1%
More than 20 years	4	22.2%

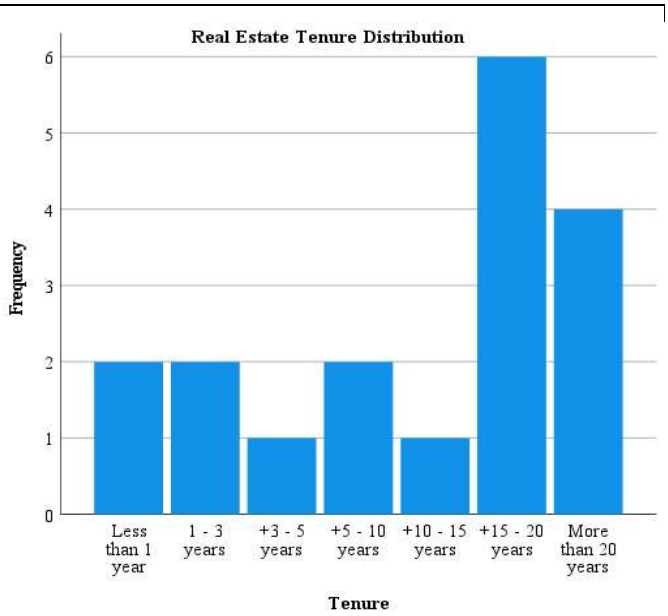

Figure 17 Real Estate Tenure Distribution

Real Estate broker average earnings per month		
	N	%
Less than R4,000 per month	1	5.6%
R8,001 - R16,000 per month	1	5.6%
R16,001 - R32,000 per month	4	22.2%
R32,001 - R64,000 per month	5	27.8%
R64,001 - R128,000 per month	6	33.3%
More than R128,000 per month	1	5.6%

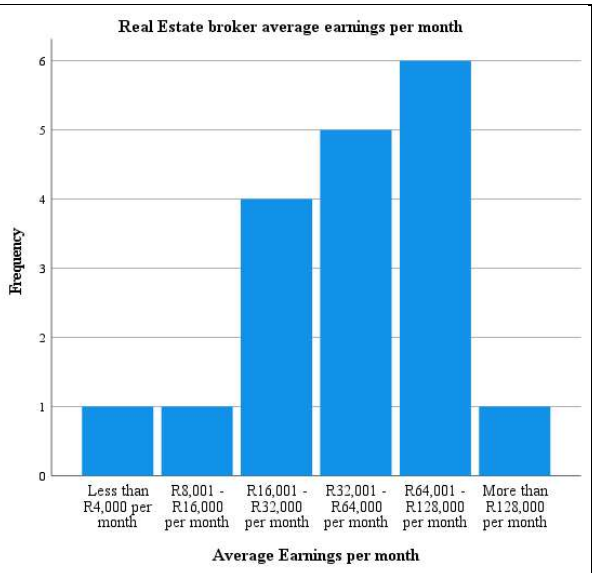

Figure 18 Real Estate broker average earnings per month

Average Transaction Value

N	Valid	18
	Missing	0
Mean		R1,412,986.87
Median		R1,181,368.86
Mode		R769,025[a]
Std. Deviation		R613,230.660
Skewness		1.353
Std. Error of Skewness		.536
Kurtosis		1.075
Std. Error of Kurtosis		1.038
Minimum		R769,025
Maximum		R2,905,025

a. Multiple modes exist. The smallest value is shown

Average Transaction Value

	N	%
R769,025	1	5.6%
R889,760	1	5.6%
R897,616	1	5.6%
R980,000	1	5.6%
R995,000	1	5.6%
R996,386	1	5.6%
R1,043,225	1	5.6%
R1,100,000	1	5.6%
R1,169,258	1	5.6%
R1,193,480	1	5.6%
R1,212,883	1	5.6%
R1,462,361	1	5.6%
R1,464,965	1	5.6%
R1,726,236	1	5.6%
R1,904,521	1	5.6%
R2,089,598	1	5.6%
R2,634,425	1	5.6%
R2,905,025	1	5.6%

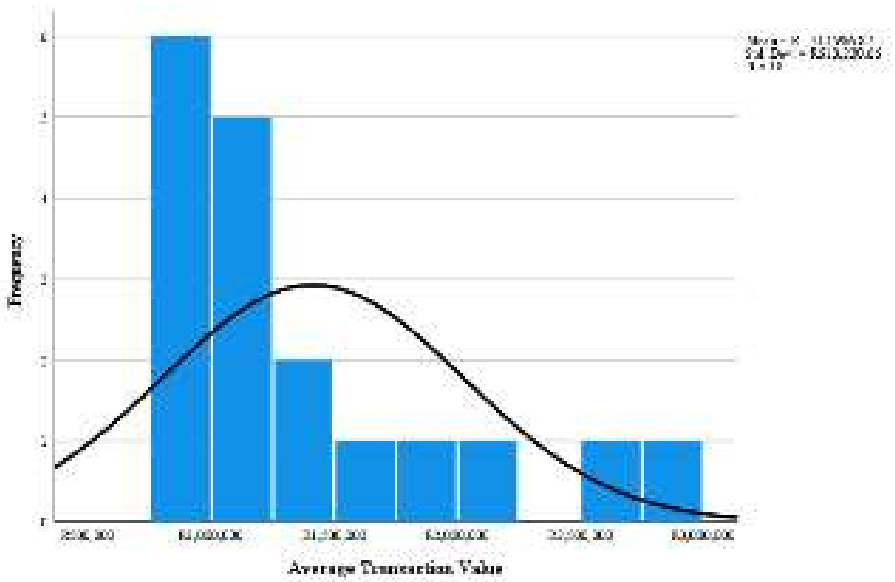

Figure 19 Average broker operating area transaction value

Success Score

N	Valid	18
	Missing	0
Mean		.9554
Median		.9155
Mode		.06[a]
Std. Deviation		.59307
Skewness		.395
Std. Error of Skewness		.536
Kurtosis		-.622
Std. Error of Kurtosis		1.038

a. Multiple modes exist. The smallest value is shown

Success Score

	N	%
.06	1	5.6%
.26	1	5.6%
.28	1	5.6%
.31	1	5.6%
.49	1	5.6%
.60	1	5.6%
.73	1	5.6%
.73	1	5.6%
.81	1	5.6%
1.02	1	5.6%
1.07	1	5.6%
1.09	1	5.6%
1.19	1	5.6%
1.39	1	5.6%
1.46	1	5.6%
1.76	1	5.6%
1.83	1	5.6%
2.14	1	5.6%

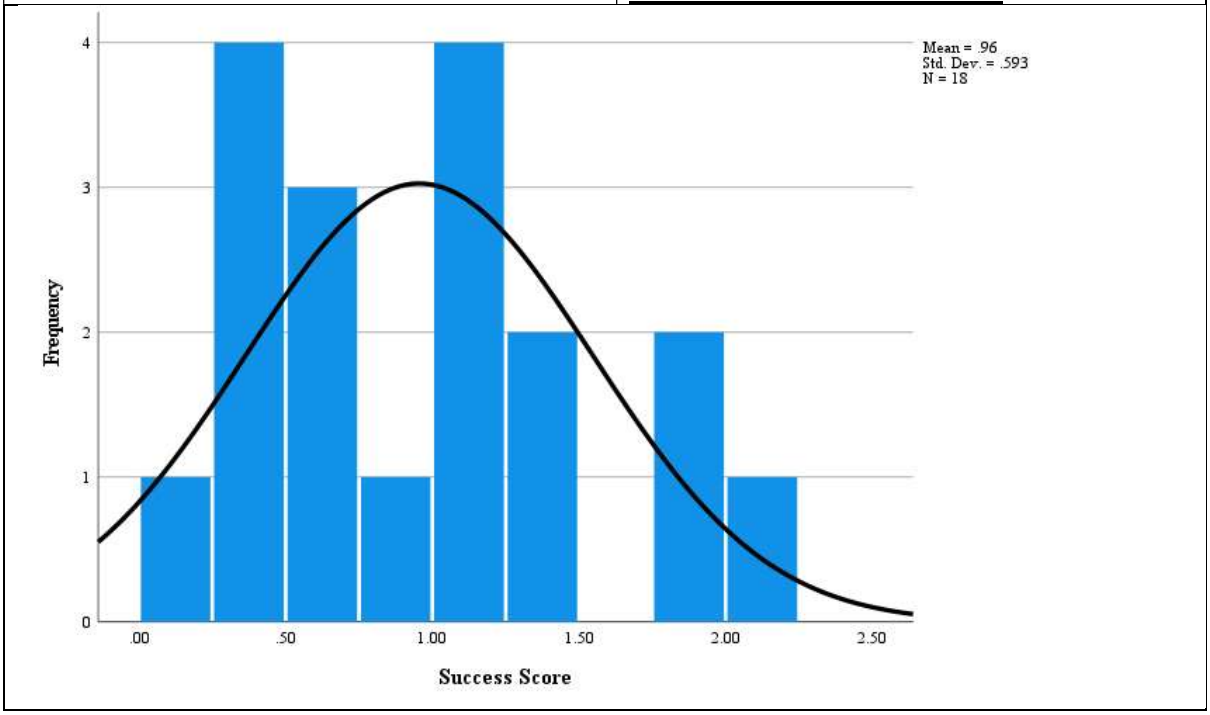

Figure 20 Broker Success Score

The distribution statistics of the broker survey Likert scale items are detailed in table 12 below.

	N				Std.
	Valid	Missing	Mean	Median	Deviation
Q6	18	0	4.83	5.00	.383
Q7	18	0	4.72	5.00	.958
Q8	18	0	4.39	5.00	1.037
Q10	18	0	4.89	5.00	.323
Q11	18	0	4.83	5.00	.514
Q12	18	0	4.44	5.00	.705
Q13	18	0	4.39	5.00	.850
Q14	18	0	4.11	5.00	1.278
Q16	18	0	4.78	5.00	.428
Q17	18	0	4.00	4.00	.970
Q19	18	0	4.61	5.00	.608
Q20	18	0	4.50	5.00	.786
Q21	18	0	3.83	4.00	1.043
Q22	18	0	3.67	3.50	.907
Q23	18	0	4.44	5.00	.784

Table 12 Distribution of broker survey Lickert score items.

The key broker variables detailed in Table 4 and calculated as the mean value of the constituent survey items are described in Table 13.

	N				
Key Broker Variables	Valid	Minimum	Maximum	Mean	Std. Deviation
V10 Degree of market knowledge	18	3.25	5.00	4.6389	.55055
V11 Degree of Real Estate intermediation experience	18	1.50	5.50	4.0833	.97392
V12 Ability to reduce transaction risk	18	2.67	5.00	3.9630	.79120
V13 Efficacy of information search	18	3.20	5.00	4.6111	.47760
V14 Efficacy of transaction management	18	3.33	5.00	4.3148	.56560

Table 13 Distribution of Key broker variables

Reliability and Validity

Table 8 details the results of the reliability testing of the consumer variables, the following observations are made regarding the reliability and validity of the key consumer variables:

V10 Degree of market knowledge.

V10 exhibits an acceptable degree of internal consistency (α = 0.721) and strong inter-item correlation (r = 0.533).

V11 Degree of Real Estate intermediation experience.

V11 displays a poor degree of internal consistency (α = -2.260). Interestingly the level of broker education (Q2) shows a strong negative correlation with broker tenure (Q1) r = -0.535. This result suggests that brokers with long tenure in the industry tend to have less formal education. Alternatively, those with a greater degree of formal education are less likely to embark on a career within the residential Real Estate intermediation industry early on in their working lives.

V12 Ability to reduce transaction risk.

V12 exhibits a moderate degree of internal consistency (α = 0.799) and strong inter-item correlation (r = 0.566).

V13 Efficacy of information search.

V13 exhibits less than ideal internal consistency (α = 0.600) and inter-item correlation (r = 0.194). Whilst Q7 and Q8 display a strong correlation (r = 0.826), the remaining items (Q10, Q12, and Q19) display a weak positive correlation with Q8 and either a weak positive (Q12) or weak negative (Q10 and Q19) correlation with Q7.

V14 Efficacy of transaction management.

V14 exhibits a poor degree of internal consistency (α = 0.368) and inter-item correlation (r = 0.167).

Key Broker Variables	Items	Cronbach's Alpha	Inter-item Correlation
V10 Degree of market knowledge	Q6; Q11; Q14; Q16	0.721	0.533
V11 Degree of Real Estate intermediation experience	Q1; Q2	-2.260	-0.535
V12 Ability to reduce transaction risk	Q13; Q21; Q22	0.799	0.566
V13 Efficacy of information search	Q7; Q8; Q10; Q12; Q19	0.600	0.194
V14 Efficacy of transaction management	Q17; Q20; Q23	0.368	0.167

Table 14 Cronbach's alpha & Inter-item correlation values for key broker variables.

In terms of validity, given the relatively small sample size, N= 18, the results of this research should be considered exploratory or tentative in nature.

Sub-hypotheses Testing

H1. The primary services provided by Real Estate brokers in the context of Information Search and Transaction Management have evolved in response to advances in technology.

The distribution of scores, shown in figure 21, for both V13: Efficacy of information search ($\bar{x}$ = 4.61) and V14: Efficacy of transaction management ($\bar{x}$ = 4.31) suggest that, for this sample of brokers, technology has had a positive impact on the ability of brokers. However, technology is perceived as having a greater effect on the efficacy of information search relative to the impact on transaction management. It can therefore be inferred that brokers adopt technologies that enhance their ability to intermediate the residential Real Estate property market with technology perceived as being an intermediation enabler. The types of technology adopted and its impact on broker success is therefore an area for future research.

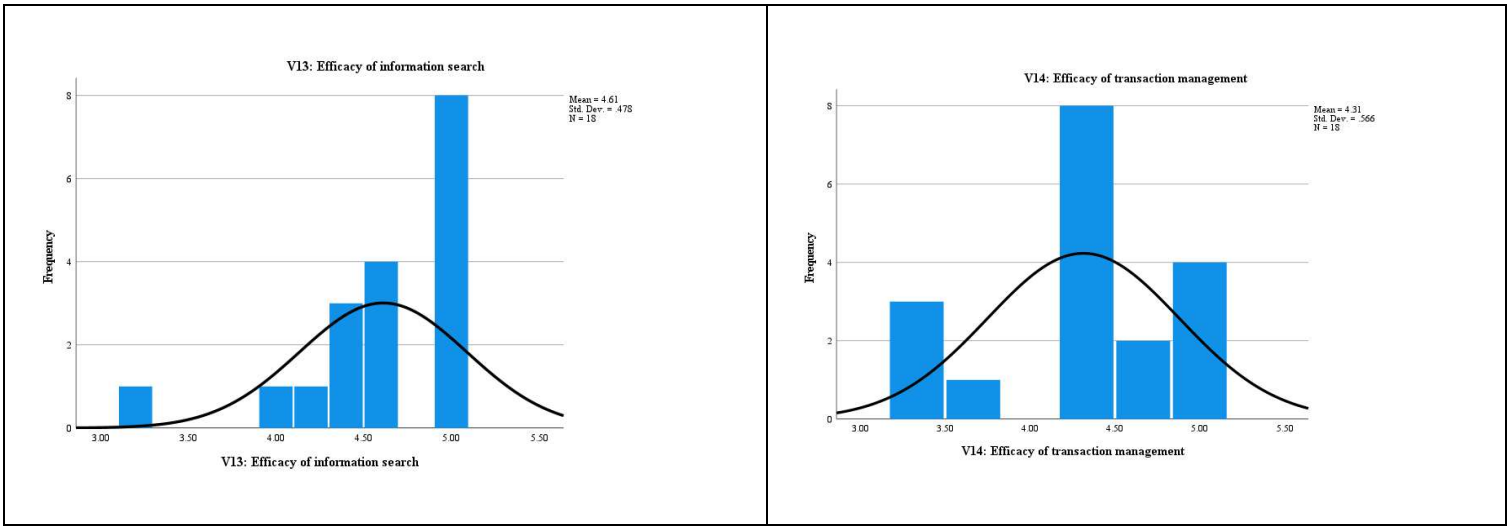

Figure 21 Distribution of Efficacy of information search and Efficacy of transaction management scores

H4. Strategies can be employed by Real Estate brokers to differentiate themselves and compete in an increasingly technology-driven market that are effective in terms of attracting and retaining clients.

The relatively low median scores for Q21 ($\bar{x}$ = 3.83) and Q22 ($\bar{x}$ = 3.67) suggest that technology isn't perceived as having improved brokers ability to address and resolve conflicts or manage negotiations effectively relative to its impact on other intermediation components. Similar to the findings of (Larceneux, Lefebvre & Simon, 2015) this represents an opportunity for brokers to promote their negotiation and risk mitigation capabilities in order to attract clients. By extension, technology that enhances brokers negotiation and risk mitigation capabilities is likely to be well received.

Summary

This research examines the relationship between technological familiarity and the value perception of brokerage services in the Real Estate industry, using data from consumer and broker surveys. The consumer survey, with a completion rate of 61.86%, focused on the perceived value of information search and transaction management services in Real Estate transactions relative to familiarity with Real Estate technology and experience. It utilised descriptive statistics and regression analysis to analyse the data, including imputation for missing values in Likert scale items.

The research finds correlations between variables like Real Estate experience, familiarity with Real Estate FinTech, and the perceived value of various Real Estate services. It highlights that technological familiarity can explain a significant portion of the variance in perceived value of Real Estate intermediation services. The analysis also identifies which individual elements of Real Estate services contribute most significantly to their perceived value, suggesting that agents' roles are evolving more towards process facilitation rather than just property search.

The broker survey, with a completion rate of 62.07%, revealed insights into brokers' market knowledge, Real Estate intermediation experience, and the impact of technology on their services. It shows that technology has positively influenced the efficacy of information search more than transaction management. The research suggests that technology is seen as an enabler in the intermediation of the residential Real Estate market, and there are opportunities for brokers to differentiate themselves by enhancing their negotiation and risk mitigation capabilities with technology.

Overall, the analysis finds that while technology significantly influences the perceived value of Real Estate brokerage services, the human elements of negotiation and risk mitigation remain crucial. Due to the small sample sizes, the findings are considered exploratory and highlight areas for future research.

5. Research Conclusions

This study set out to examine the impact of technological advancements on the Real Estate brokerage industry, focusing on Information Search and Transaction Management services. The research aimed to understand how technology has reshaped the value perception of brokerage services among buyers and sellers, and to identify strategies for brokers to remain competitive in this technology-driven market.

Findings

Evolution of Brokerage Services (H1): The research indicates that Real Estate brokers have adapted to technological changes, particularly in enhancing the efficacy of information search services. The hypothesis is therefore accepted. This adaptation suggests a positive shift in the industry, with technology being seen as an enabler for more efficient intermediation in the Real Estate market.

Perception of Brokerage Services (H2): There is a clear indication that familiarity with Real Estate FinTech positively correlates with the perceived value of Real Estate intermediation services. The hypothesis is therefore accepted. This finding underscores the importance of technological integration in enhancing the perceived value of brokerage services.

Valued Elements in Services (H3): The study reveals that specific elements of Information Search and Transaction Management, such as negotiating skills, evaluating offers, and matching properties with client preferences, significantly contribute to the perceived value of brokerage services. However, the combined effect of these elements suggests a notable shared variance, indicating that a holistic approach to service delivery is valued by clients. The hypothesis is therefore accepted.

Strategies for Competitive Edge (H4): The research points to areas where technology has not significantly improved brokerage services, such as conflict resolution and negotiation management. This gap presents an opportunity for brokers to leverage technology further or highlight their unique human-led capabilities in these areas to differentiate themselves in the market. The hypothesis is therefore accepted.

The primary hypothesis, that technology impacts consumer and broker perceptions of Real Estate intermediation effecting intermediaries ability to sustain a competitive advantage, is therefore accepted.

In concluding, this research comprehensively addresses its aim to explore the impact of technological advancements on the services offered by brokers, with a focus on Information Search and Transaction Management in the Real Estate sector. The findings align closely with the research objectives, providing insightful answers to the posed questions and confirming the hypotheses. Firstly, the evolution of brokerage services in response to technology (H1) is evident, underscoring a shift towards more efficient intermediation driven by technological enhancements. This evolution directly addresses the aim to identify key elements in Real Estate transaction intermediation.

Secondly, the research reveals how technology influences the perceived value of brokerage services (H2), aligning with the objective to understand consumer and broker perceptions in a technology-driven market. The positive correlation between familiarity with Real Estate FinTech and the perceived value of these services highlights the need for technological integration in brokerage.

The third finding, regarding the valued elements in brokerage services (H3), ties back to the objective of determining specific aspects of Information Search and Transaction Management that clients value most. It demonstrates that while certain elements like negotiation skills and property-client matching are highly valued, a holistic service approach is crucial for maximizing perceived value.

Lastly, the identification of strategies for brokers to maintain a competitive edge in a technology-driven market (H4) is a direct response to the study's aim and objectives. The research identifies gaps in technology's ability to replace human-led capabilities in areas like conflict resolution, offering brokers clear strategies to differentiate their services.

Overall, the research successfully links its aims, objectives, hypotheses, and findings, providing a nuanced understanding of how technology shapes the Real Estate brokerage industry and offering actionable insights for brokers to maintain their relevance and competitive advantage in a rapidly evolving market landscape.

Implications and Future Research

The findings of this study have several implications for the Real Estate brokerage industry. Firstly, there is a clear need for brokers to continually adapt and integrate technology into their service offerings to meet changing consumer expectations. Secondly, while technology plays a critical role, the human element in brokerage services, particularly in negotiation and conflict resolution, remains irreplaceable and should be emphasized as a unique selling proposition.

Future research could explore the types of technologies that are most effective in enhancing various aspects of Real Estate brokerage services and investigate the potential of emerging technologies in areas currently underserved, such as conflict resolution in transactions.

Reflection on the research

Reflecting on this research journey, my motivation for selecting this topic stems from a personal connection to the Real Estate industry, which has been an integral part of my family's life for over three decades. This industry not only provided my parents with a sustained livelihood but also opened numerous learning and career opportunities for me. Delving into this research was not just an academic pursuit; it was a way to give back to an industry that has given so much to my family. Additionally, my goal was to uncover deeper motivations and mechanisms driving the Real Estate industry, enriching my understanding of a field so closely intertwined with my personal history.

During the research period, the emergence of Large Language Model tools like OpenAI's ChatGPT, Google's Bard, and DeepMind's MuZero presented an intriguing possibility. These tools, with their potential in enhanced negotiation and conflict resolution, could significantly impact the Real Estate sector. As someone closely observing the industry, the integration of such advanced AI in Real Estate intermediation, particularly in the nuanced areas of negotiation, posed a fascinating avenue for exploration. It represents a shift from traditional methods to more sophisticated, data-driven approaches that could redefine industry practices.

However, the research process was not without its challenges. A notably poor response rate from brokers, despite the potential benefits of participating in the study, was both surprising and revealing. This reluctance to engage in academic research suggests a lack of professional development within the industry, with a possible overemphasis on short-term gains over long-term strategic thinking and industry advancement. It indicates a gap between current practices and the potential for growth and improvement within the field.

This reluctance might also be rooted in the nature of the industry itself. The Real Estate market, characterised by relatively low barriers to entry, is fiercely competitive. In such an environment, there's a natural hesitancy to share information that could potentially erode one's competitive edge. This dynamic underscores the delicate balance brokers must maintain between collaboration and competition, and perhaps points to an underlying need for a more cooperative framework within the industry.

The theoretical underpinning of Transaction Cost Economics, with its assumption of the economic man as a rational actor, was also a critical part of this study. However, the work of researchers like Daniel Kahneman, who demonstrates that decision-making is often irrational, adds a layer of complexity to this assumption. This perspective is particularly relevant in the context of negotiation and conflict resolution in Real Estate transactions. The introduction of AI tools capable of learning and executing effective non-linear negotiation strategies could revolutionise this aspect of Real Estate intermediation. It suggests a future where technology not only enhances but fundamentally transforms the way negotiations are conducted in the Real Estate industry.

In summary, this research has been a deeply personal and professionally enlightening journey. It has offered insights into the evolving landscape of the Real Estate industry, the potential impact of emerging technologies, and the human aspects that continue to define the industry's character. This reflection not only encapsulates the research's findings but also highlights the broader implications and potential future directions for the Real Estate sector.

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Annexure 1: Surveys

Broker Survey:

Hypothesis	Element	Variable	Question	Rationale for inclusion
H1	Information Search	V10: Degree of market knowledge	Q7: The use of technology has significantly improved the speed and accuracy of property searches conducted by Real Estate agents. Please rate from 1 (Strongly Disagree) to 5 (Strongly Agree).	The extent to which technology enables intermediation or reintemediation. (Agarwal et al., 2019; Sawyer et al., 2003; Wigand, 2020)
H1	Information Search	V10: Degree of market knowledge	Q16: Real Estate agents now have access to more comprehensive and up-to-date market data due to technological advancements. Please rate from 1 (Strongly Disagree) to 5 (Strongly Agree).	The extent to which technology enables intermediation or reintemediation. (Agarwal et al., 2019; Sawyer et al., 2003; Wigand, 2020)
H1	Information Search	V13: Efficacy of information search	Q10: Technology has enabled Real Estate agents to better analyse and present market trends and property values to their clients. Please rate from 1 (Strongly Disagree) to 5 (Strongly Agree).	The extent to which technology enables intermediation or reintemediation. (Agarwal et al., 2019; Sawyer et al., 2003; Wigand, 2020)
H1	Information Search	V13: Efficacy of information search	Q12: Real Estate agents effectively utilize digital tools to provide clients with detailed property information, including photos, virtual tours, and property history. Please rate from 1 (Strongly Disagree) to 5 (Strongly Agree).	The extent to which technology enables intermediation or reintemediation. (Agarwal et al., 2019; Sawyer et al., 2003; Wigand, 2020)
H1	Information Search	V13: Efficacy of information search	Q8: The integration of online platforms and databases has enhanced the ability of agents to match buyers with properties that meet their preferences. Please rate from 1 (Strongly Disagree) to 5 (Strongly Agree).	The extent to which technology enables intermediation or reintemediation. (Agarwal et al., 2019; Sawyer et al., 2003; Wigand, 2020)
H1	Information Search	V13: Efficacy of information search	Q19: Real Estate agents leverage technology to communicate property listings and updates to clients in a more timely and efficient manner.	The extent to which technology enables intermediation or reintemediation. (Sawyer et al., 2003; Wigand, 2020)

			Please rate from 1 (Strongly Disagree) to 5 (Strongly Agree).	
H1	Transaction Management	V14: Efficacy of transaction management	Q17: Technology has streamlined the process of document preparation and signing, reducing the administrative burden on both clients and agents. Please rate from 1 (Strongly Disagree) to 5 (Strongly Agree).	The extent to which technology enables intermediation or reintemediation. (Sawyer et al., 2003; Wigand, 2020)
H1	Transaction Management	V12: Ability to reduce transaction risk	Q22: Real Estate agents use digital tools to manage negotiations and offer presentations more effectively, benefiting both buyers and sellers. Please rate from 1 (Strongly Disagree) to 5 (Strongly Agree).	The extent to which technology enables intermediation or reintemediation. (Sawyer et al., 2003; Wigand, 2020)
H1	Transaction Management	V12: Ability to reduce transaction risk	Q13: Advances in technology have allowed Real Estate agents to provide clients with a clearer understanding of the legal and financial aspects of transactions. Please rate from 1 (Strongly Disagree) to 5 (Strongly Agree).	The extent to which technology enables intermediation or reintemediation. (Sawyer et al., 2003; Wigand, 2020)
H1	Transaction Management	V14: Efficacy of transaction management	Q23: Technology has enabled agents to better track and manage the various stages of a transaction, ensuring smoother and more organized processes. Please rate from 1 (Strongly Disagree) to 5 (Strongly Agree).	The extent to which technology enables intermediation or reintemediation. (Sawyer et al., 2003; Wigand, 2020)
H1	Transaction Management	V14: Efficacy of transaction management	Q20: Real Estate agents leverage digital platforms to facilitate communication and coordination among all parties involved in a transaction. Please rate from 1 (Strongly Disagree) to 5 (Strongly Agree).	The extent to which technology enables intermediation or reintemediation. (Sawyer et al., 2003; Wigand, 2020)
H1	Transaction Management	V12: Ability to reduce transaction risk	Q21: The use of technology has enhanced the ability of agents to address and resolve conflicts or challenges that may arise during a transaction. Please rate from 1 (Strongly Disagree) to 5 (Strongly Agree).	The extent to which technology enables intermediation or reintemediation. (Sawyer et al., 2003; Wigand, 2020)

H1;H4	Transaction Management / Information search	V11: Degree of Real Estate intermediation experience	Q2: What is your highest level of education achieved? NQF 1 Grade 9 NQF 2 Grade 10 and National (vocational) Certificates level 2 NQF 3 Grade 11 and National (vocational) Certificates level 3 NQF 4 Grade 12 (National Senior Certificate) and National (vocational) Cert. level 4 NQF 5 Higher Certificates and Advanced National (vocational) Cert. NQF 6 National Diploma and Advanced certificates NQF 7 Bachelor's degree, Advanced Diplomas, Post Graduate Certificate and B-tech NQF 8 Honours degree, Post Graduate diploma and Professional Qualifications NQF 9 Master's degree NQF 10 Doctor's degree	Crowston et al referencing Benjamin et al. 2000; Follain et al. 1987; Jud et al.; Sirmans and Swicegood 2000 (Crowston, Sawyer & Wigand, 2015:367)
H1;H4	Transaction Management / Information search	V11: Degree of Real Estate intermediation experience	Q1: How long have you been a Real Estate agent? Less than 1 year 1> - 3 years 3> - 5 years 5> - 10 years 10> - 15 years 15> - 20 Years More than 20 years	Crowston et al referencing Waller and Jubran (2012) (Crowston, Sawyer & Wigand, 2015:367)

H4	Broker Success	Degree of broker success	Q3: In the last year, what has been your average monthly income after tax from providing Real Estate brokerage services? Less than R4000 per month R4000 - R8000 per month R8001 - R16000 per month R16001 - R32000 per month R32001 - R64000 per month More than R64000 per month	Crowston et al referencing Crellin, Jud, and Sirmans 1988; Jud, Winkler, and Sirmans 2002; Sirmans and Swicegood 1997(Crowston, Sawyer & Wigand, 2015:366) relative earnings as a measure of broker success
H4	Broker Success/Information search	V15: Degree of broker success moderated by Market Potential	Q4: What are the top three postcodes you typically operate in?	Crowston et al referencing Jud et al 2002 (Crowston, Sawyer & Wigand, 2015:368). Using Postcodes together with Property24 sales data for 2022 provides and indication of market size and activity. Agents operating in the area they reside are better informed.
H4	Broker Success/Information search	V10: Degree of market knowledge	Q5: What is your current residential post code?	Crowston et al referencing Follain, Lutes, and Meier 1987 (Crowston, Sawyer & Wigand, 2015:367) Agents operating in the area they reside are better informed.
H4	Broker Success	V16: Ability to signal cost efficiency	Q15: What specific strategies do you employ to communicate the value of your services in the face of technological advancements?	Qualitative question to provide insight into how brokers approach signalling service value.
H4	Information search / Transaction management	Impact of Technology	Q18: How have you adapted to changes brought about by the internet and technology?	Qualitative question to provide insight into how brokers adapted to the dissemination of information brought about by the internet.
H1	Information search	V10: Degree of market knowledge	Q6: On a scale of 1 (Not at all important) to 5 (Extremely Important), how important is developing professional relationships, networks (agents, bond consultants, attorneys)?	Saber & Messinger (Saber & Messinger, 2010:59-66) and Larceneux et al (Larceneux, Lefebvre & Simon, 2015:9-11). Also supported by Wigand, Crowston and Sawyer (Crowston, Sawyer & Wigand, 2015; Wigand, 2020)

H4	Information search	V10: Degree of market knowledge	Q14: On a scale of 1 (Not at all important) to 5 (Extremely Important), how important is identifying dependable service providers (plumbers, electricians etc)?	Saber & Messinger (Saber & Messinger, 2010:59-66) and Larceneux et al (Larceneux, Lefebvre & Simon, 2015:9-11). Also supported by Wigand, Crowston and Sawyer (Crowston, Sawyer & Wigand, 2015; Wigand, 2020)
H4	Information search	V10: Degree of market knowledge	Q11: On a scale of 1 (Not at all important) to 5 (Extremely Important), how important is developing social relationships, networks, and interactions within the community?	Saber & Messinger (Saber & Messinger, 2010:59-66) and Larceneux et al (Larceneux, Lefebvre & Simon, 2015:9-11). Also supported by Wigand, Crowston and Sawyer (Crowston, Sawyer & Wigand, 2015; Wigand, 2020)
H4	Broker Success	V12: Ability to reduce transaction risk	Q9: What strategies do you use to establish the needs, motivations, and potential influences of buyers / sellers?	Qualitative question to provide insight into how brokers approach developing/bridging information asymmetries.

Consumer Survey:

Hypothesis	Element	Variable	Question	Rationale for inclusion
H2; H3	Transaction Management	V1: Degree of Real Estate relevant transaction experience	Q6: On a scale of 1 (None) to 5 (Five or more), how many Real Estate transactions have you been a party to either as a buyer or seller?	Larcerauex et al (Larceneux, Lefebvre & Simon, 2015:18) show "the more a seller considers himself to have expert knowledge of Real Estate, the greater his tendency to sign privately with a buyer".
H2; H3	Transaction Management	V1: Degree of Real Estate relevant transaction experience	Q1: Please select your age group? Under 18 18-24 25-44 45-64 Above 64	Larcerauex et al (Larceneux, Lefebvre & Simon, 2015:16) "The younger the buyer (under 40), the greater his tendency to buy through an estate agent compared to buyers aged over 40."
H2; H3	Transaction Management	V1: Degree of Real Estate relevant transaction experience	Q4: What is your current residential postcode?	Larcerauex et al (Larceneux, Lefebvre & Simon, 2015:16) show that socio-demographic factors had no impact on the decision to use a broker in France. However, the South African socio-economic environment may well have an influence.

H2; H3	Transaction Management	V1: Degree of Real Estate relevant transaction experience	Q2: Please select your industry. Agriculture; forestry and fishing Mining and quarrying Manufacturing Water supply; sewerage, waste management and remediation activities Wholesale and retail trade; repair of motor vehicles and motorcycles Accommodation and food service activities Financial and insurance activities Professional, scientific and technical activities Public administration and defence; compulsory social security Human health and social work activities Other service activities Activities of extraterritorial organizations and bodies Not elsewhere classified	Larcerauex et al (Larceneux, Lefebvre & Simon, 2015:18) show "the more a seller considers himself to have expert knowledge of Real Estate, the greater his tendency to sign privately with a buyer".
H2; H3	Transaction Management	V1: Degree of Real Estate relevant transaction experience	Q3: Please select your Occupation. Manager Professional Technicians and associate professional Clerical support Service and sales Skilled agricultural, forestry and fishery Craft related trades Plant and machine operators, and assemblers Elementary occupations Armed forces occupations. Unemployed	Larcerauex et al (Larceneux, Lefebvre & Simon, 2015:18) show "the more a seller considers himself to have expert knowledge of Real Estate, the greater his tendency to sign privately with a buyer".

H2; H3	Information Search/Transaction Management	V2: Familiarity with Real Estate Fin Tech	Q7: On a scale of 1 (Not at all Familiar) to 5 (Extremely Familiar), how familiar are you with the availability of internet-based property tools for obtaining information about property prices, market trends, or neighbourhood conditions?	The literature consistently report that the availability of and or exposure to fin tech has an impact on information asymmetry and therefore the value of broker services (Agarwal et al., 2019; EDU, 2021; Ford, Rutherford & Yavas, 2005; Larceneux, Lefebvre & Simon, 2015; Levitt, Steven D. & Syverson, 2008; Nwogugu, 2007; Saber & Messinger, 2010; Saull, Baum & Braesemann, 2020; Starr, Saginor & Worzala, 2021; Wigand, 2020)
	Information Search/Transaction Management	V2: Familiarity with Real Estate Fin Tech	Q19: The use of technology by Real Estate brokers has significantly increased my confidence in the accuracy and reliability of the services they provide. Please rate from 1 (Strongly Disagree) to 5 (Strongly Agree).	Allied to Q7, Real Estate brokers make use of technology to service their customers.
H2; H3	Information Search/Transaction Management	V2: Familiarity with Real Estate Fin Tech	Q13: Does the availability of Real Estate information on the internet make a difference in terms of how much you value having an agent help you sell [buy] a property? Please rate from 1 (Value agent much Less) to 5 (Value agent much More)	The literature consistently report that the availability of and or exposure to fin tech has an impact on information asymmetry and therefore the value of broker services (Agarwal et al., 2019; EDU, 2021; Ford, Rutherford & Yavas, 2005; Larceneux, Lefebvre & Simon, 2015; Levitt, Steven D. & Syverson, 2008; Nwogugu, 2007; Saber & Messinger, 2010; Saull, Baum & Braesemann, 2020; Starr, Saginor & Worzala, 2021; Wigand, 2020)
		Qualitative follow up question to Q13	Q14: If your value of an agent has changed because of Real Estate information on the internet, please describe why. (Space then followed for the answer.)	Qualitative follow up question to Q13

H2; H3	Information Search	V8: Distance from Market	Q17: Please rate from 1 (Not at all Challenging) to 5 (Extremely Challenging), if moving to a new area, how challenging you would find obtaining accurate information about property prices, market trends, or neighbourhood conditions on your own.	Ling et al (Ling, Naranjo & Petrova, 2018) Show that distance from market increases information asymmetries and therefore search costs
H2; H3	Information Search / Transaction Management	V4: Degree of perceived transaction risk	Q23: To what extent do you feel uncertain or overwhelmed by the complexities in negotiation, legalities, or understanding market conditions involved in Real Estate transactions? Please rate from 1 (Not at all Uncertain) to 5 (Extremely Uncertain)	Saber & Messinger (Saber & Messinger, 2010:59-66) and Larceneux et al (Larceneux, Lefebvre & Simon, 2015:9-11)
H2; H3	Information Search	V5: Value of information search services	Q8: On a scale of 1 (Not at all important) to 5 (Extremely Important), how important is having access to current market information when you're thinking about buying or selling a property?	Saber & Messinger (Saber & Messinger, 2010:59-66) and Larceneux et al (Larceneux, Lefebvre & Simon, 2015:9-11)
H2; H3	Information Search	V5: Value of information search services	Q21: Please rate from 1 (Not at all Challenging) to 5 (Extremely Challenging) how challenging you would find obtaining accurate information about property prices, market trends, or neighbourhood conditions on your own.	Saber & Messinger (Saber & Messinger, 2010:59-66) and Larceneux et al (Larceneux, Lefebvre & Simon, 2015:9-11) and Ling et al (Ling, Naranjo & Petrova, 2018) Show that distance from market increases information asymmetries and therefore search costs.
H2; H3	Information Search	V6: Degree of brand trust	Q15: How much do you agree or disagree that a recognised Real Estate brand is more capable of providing accurate information about property prices, market trends, or neighbourhood conditions? Please rate from 1 (Strongly Disagree) to 5 (Strongly Agree).	Saber & Messinger (Saber & Messinger, 2010:59-66) and Larceneux et al (Larceneux, Lefebvre & Simon, 2015:9-11) but testing the extend to which brand signals influence perception (Connelly et al., 2011).

H2; H3	Information Search	V5: Value of information search services	Q12: How much do you agree or disagree that having a Real Estate agent who can offer expert guidance about the buying or selling process would be valuable? Please rate from 1 (Strongly Disagree) to 5 (Strongly Agree).	Saber & Messinger (Saber & Messinger, 2010:59-66) and Larceneux et al (Larceneux, Lefebvre & Simon, 2015:9-11)
H2; H3	Information Search	V5: Value of information search services	Q25: On a scale of 1 (Extremely unlikely) to 5 (Extremely Likely), how likely are you to prefer a Real Estate agent's assistance in managing uncertainties and risks associated with property transactions?	Saber & Messinger (Saber & Messinger, 2010:59-66) and Larceneux et al (Larceneux, Lefebvre & Simon, 2015:9-11)
H2; H3	Information Search	V5: Value of information search services	Q22: To what extent do you value an agent's skill in matching your preferences with appropriate properties in the market? Please rate from 1 (Not Valuable) to 5 (Extremely Valuable).	Saber & Messinger (Saber & Messinger, 2010:59-66) and Larceneux et al (Larceneux, Lefebvre & Simon, 2015:9-11)
H2; H3	Transaction Management	V7: Value of transaction management services	Q9: Please rate from 1 (Not Important) to 5 (Extremely Important), how much do you feel an agent's guidance on the legal and financial aspects of a Real Estate transaction would be valuable?	Saber & Messinger (Saber & Messinger, 2010:59-66) and Larceneux et al (Larceneux, Lefebvre & Simon, 2015:9-11)
H2; H3	Information Search / Transaction Management	V5: Value of information search services / V7: Value of transaction management services	Q24: Please rate from 1 (Not at all important) to 5 (Extremely Important) how much importance you place on an agent's negotiation skills in achieving favourable terms and prices during the buying or selling process.	Saber & Messinger (Saber & Messinger, 2010:59-66) and Larceneux et al (Larceneux, Lefebvre & Simon, 2015:9-11)
H2; H3	Information Search / Transaction Management	V5: Value of information search services / V7: Value of transaction management services	Q16: On a scale of 1 (Not Likely) to 5 (Very Likely), how likely are you to rely on a Real Estate agent's expertise for evaluating property offers, formulating counteroffers, and negotiation?	Saber & Messinger (Saber & Messinger, 2010:59-66) and Larceneux et al (Larceneux, Lefebvre & Simon, 2015:9-11)

H2; H3	Transaction Management	V7: Value of transaction management services	Q11: 1 (Not Valuable) to 5 (Extremely Valuable) how much value you see in an agent's ability to connect you with other professionals, such as other agents, legal experts, and compliance inspectors, for a smooth transaction.	Saber & Messinger (Saber & Messinger, 2010:59-66) and Larceneux et al (Larceneux, Lefebvre & Simon, 2015:9-11). Also supported by Wigand, Crowston and Sawyer (Crowston, Sawyer & Wigand, 2015; Wigand, 2020)
H2; H3	Transaction Management	V7: Value of transaction management services	Q18: Rate from 1 (Not at all important) to 5 (Extremely Important) how much you might appreciate having an agent who can handle administrative tasks and coordination, saving you time and effort.	Saber & Messinger (Saber & Messinger, 2010:59-66) and Larceneux et al (Larceneux, Lefebvre & Simon, 2015:9-11)
H2; H3	Transaction Management	V7: Value of transaction management services	Q20: How much do you agree or disagree that having a Real Estate agent's support reduces the stress and emotional burden of property transactions? Please rate from 1 (Strongly Disagree) to 5 (Strongly Agree).	Saber & Messinger (Saber & Messinger, 2010:59-66) and Larceneux et al (Larceneux, Lefebvre & Simon, 2015:9-11)
H2; H3	Transaction Management	V6: Degree of brand trust	Q10: How much do you agree or disagree that a recognised Real Estate brand is more capable of managing uncertainties and risks associated with property transactions? Please rate from 1 (Strongly Disagree) to 5 (Strongly Agree).	Saber & Messinger (Saber & Messinger, 2010:59-66) and Larceneux et al (Larceneux, Lefebvre & Simon, 2015:9-11) but testing the extend to which brand signals influence perception (Connelly et al., 2011).

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Annexure 2: Informed Consent Document

Broker Document

University of Cape Town - Faculty of Engineering & the Built Environment

Department of Construction Economics and Management

INFORMATION SHEET & CONSENT FORM

Hello, my name is Justin Marshall, and I am conducting research towards a master's degree at the University of Cape Town. I am researching the effect of technology on Real Estate services and would like to invite you to participate in the project.

What is this research about?

I am interested in finding out about what drives sellers & buyers of residential Real Estate to make use of Real Estate agents, and to identify effective strategies for Real Estate agents to differentiate their services and compete in an increasingly technology-driven market.

Voluntary Participation

Please understand that you do not have to participate, i.e., your participation is voluntary. The choice to participate is yours alone. If you choose not to participate, there will be no negative consequence. If you choose to participate, but wish to withdraw at any time, you will be free to do so without negative consequence. However, I would be grateful if you would assist me by completing this survey.

The survey consists of 23 questions regarding your background in Real Estate, the context in which you currently operative, and your perceptions regarding the relative value of Real Estate agent activities together with the impact of technology. The survey should take approximately 8 minutes to complete.

Risks & Benefits

This survey is intended to capture objective and subjective data pertaining to the provision of residential Real Estate services in a manner that avoids harm or discomfort. However, participants may perceive the

survey as lengthy. You are welcome to withdraw at any time, you will be free to do so without negative consequence.

Anonymity

Participants' personal information, such as name and contact details, will not be collected unless they opt to participate in the draw. The contact details of those participants opting into the draw will be separated from the collected data and used solely for the purposes of the draw. Once the draw has taken place, all contact details will be deleted.

All participants will be assigned a unique identification number that will be used throughout the research project. Any information collected during the research will be kept confidential and anonymous.

Confidentiality:

All information collected during the research will be kept confidential, and only the researcher and supervisor will have access to the data. Participants' personal information will not be shared with any third parties without their prior consent, except in cases where it is required by law or authorised by the relevant authorities.

Should you have any questions about this research, please contact me via email mrsjus006@myuct.ac.za.

Select Continue to participate in this research **Continue**

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Seller/Buyer Document

University of Cape Town - Faculty of Engineering & the Built Environment

Department of Construction Economics and Management

INFORMATION SHEET & CONSENT FORM

Hello, my name is Justin Marshall, and I am conducting research towards a master's degree at the University of Cape Town. I am researching the effect of technology on Real Estate services and would like to invite you to participate in the project.

What is this research about?

I am interested in finding out about what drives sellers & buyers of residential Real Estate to make use of Real Estate agents, and to identify effective strategies for Real Estate agents to differentiate their services and compete in an increasingly technology-driven market.

Voluntary Participation

Please understand that you do not have to participate, i.e., your participation is voluntary. The choice to participate is yours alone. If you choose not to participate, there will be no negative consequence. If you choose to participate, but wish to withdraw at any time, you will be free to do so without negative consequence. However, I would be grateful if you would assist me by completing this survey.

The survey consists of 26 questions regarding your background and your perceptions of Real Estate services, and your perceptions regarding the relative value of Real Estate agent activities. The survey should take approximately 15minutes to complete.

Risks & Benefits

This survey is intended to capture objective and subjective data pertaining to the provision of residential Real Estate services in a manner that avoids harm or discomfort. However, participants may perceive the survey as lengthy. You are welcome to withdraw at any time, you will be free to do so without negative

consequence. In addition, please let me know if you would like to receive a copy of the final research paper by selecting the option on the survey.

Anonymity

Participants' personal information, such as name and contact details, will not be collected unless they opt to receive a copy of the research.

All participants will be assigned a unique identification number that will be used throughout the research project. Any information collected during the research will be kept confidential and anonymous.

Confidentiality:

All information collected during the research will be kept confidential, and only the researcher and supervisor will have access to the data. Participants' personal information will not be shared with any third parties without their prior consent, except in cases where it is required by law or authorised by the relevant authorities.

Should you have any questions about this research, please contact me via email mrsjus006@myuct.ac.za.

Select Continue to participate in this research **Continue**

Annexure 3: Ethics Approval

UNIVERSITY OF CAPE TOWN

2023/08/11

EBE/00308/2023

RE: Research Ethics Committee Project Approval Letter

Dear Justin Marshall,

Your application for ethics review of your project titled

Strategies for Real Estate Brokers to Compete in an Increasingly Technology-Driven Market: Exploring the Value of Information Search and Transaction Management.

has been reviewed and evaluated by the

Engineering & Built Environment Committee.

You may proceed with your research project titled:

Strategies for Real Estate Brokers to Compete in an Increasingly Technology-Driven Market: Exploring the Value of Information Search and Transaction Management.

Please note that should:

(i) any serious or adverse effects to participants occur and/or,

(ii) aspect(s) of your current project change and/or

(iii) any unforeseen events that might affect continued ethical acceptability of the project occur then you should immediately report this to the approving REC. You may be required to submit an amendment to this application, in order to determine whether the changed aspects increase the ethical risks of your project.

Based on the information supplied your application has been successful and is approved.

Please note the following additional conditions associated with this approval:

(i)

Regards,

Engineering & Built Environment Committee.