CONCEPTUAL INSIGHTS ON FACTORS SHAPING TAKAFUL TECHNOLOGY (TAKATECH) ADOPTION IN MALAYSIA

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ABSTRACT

The takaful and insurance industry is profoundly transformed, driven by rapid advancements in digital technology and the Internet of Things (IoT). While InsurTech has revolutionised traditional insurance practices, the acceptance of Takaful Technology (TakaTech) among consumers in Malaysia remains uncertain. This study aims to investigate the determinants of TakaTech adoption, focusing on attitude, subjective norm, relative benefit, and FinTech knowledge. The research is grounded in an extensive literature review and a conceptual framework analysis, drawing from an established Theory of Reasoned Action with relative benefit and Fintech knowledge. This study contributes to understanding consumer behaviour in the takaful industry, addressing a notable gap in current research. The identified determinants offer a detailed comprehension that can guide policymakers and market participants in refining marketing tactics. Takaful companies, armed with insights into customer viewpoints, can strategically promote products, increase market share, and expand commercial operations. It is essential to acknowledge the study's limitations. The conceptual nature precludes the establishment of causal linkages, and the proposed elements are derived from theoretical frameworks. Practical implications include the potential improvement of marketing efforts by tailoring strategies to customer preferences, thereby fostering TakaTech adoption. In conclusion, this research lays the groundwork for future empirical studies in the relatively unexplored field of Takaful Technology. Subsequent inquiries should examine additional factors and provide empirical evidence to authenticate the proposed conceptual framework. These efforts are vital for advancing knowledge in the expanding field of Takaful Technology, promoting continuous growth and innovation within the takaful industry.

Keywords: TakaTech, Attitude, Subjective Norms, Relative Advantage, FinTech Literacy

Abstrak
Industri takaful dan insurans telah berubah secara mendalam, didorong oleh kemajuan pesat dalam teknologi digital dan Internet Perkara (IoT). Walaupun InsurTech telah merevolusikan amalan insurans tradisional, penerimaan Teknologi Takaful (TakaTech) dalam kalangan pengguna di Malaysia masih tidak menentu. Kajian ini bertujuan untuk menyiasat penentu penerimaan TakaTech, memberi tumpuan kepada sikap, norma subjektif, faedah relatif, dan pengetahuan FinTech. Penyelidikan ini berasaskan kajian literatur yang meluas dan analisis rangka kerja

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konseptual, berdasarkan Teori Tindakan Beralasan yang mantap dengan faedah relatif dan pengetahuan Fintech. Kajian ini menyumbang kepada pemahaman tingkah laku pengguna dalam industri takaful, menangani jurang yang ketara dalam penyelidikan semasa. Penentu yang dikenal pasti menawarkan pemahaman terperinci yang boleh membimbing penggubal dasar dan peserta pasaran dalam memperhalusi taktik pemasaran. Syarikat takaful, bersenjatakan pandangan tentang sudut pandangan pelanggan, boleh mempromosikan produk secara strategik, meningkatkan bahagian pasaran dan mengembangkan operasi komersial. Adalah penting untuk mengakui batasan kajian. Sifat konseptual menghalang penubuhan hubungan sebab akibat, dan unsur-unsur yang dicadangkan diperoleh daripada kerangka teori. Implikasi praktikal termasuk potensi penambahbaikan usaha pemasaran dengan menyesuaikan strategi mengikut keutamaan pelanggan, seterusnya memupuk penggunaan TakaTech. Kesimpulannya, penyelidikan ini meletakkan asas untuk kajian empirikal masa hadapan dalam bidang Teknologi Takaful yang agak belum diterokai. Siasatan seterusnya harus meneliti faktor tambahan dan menyediakan bukti empirikal untuk mengesahkan rangka kerja konseptual yang dicadangkan. Usaha ini adalah penting untuk memajukan pengetahuan dalam bidang Teknologi Takaful yang berkembang, menggalakkan pertumbuhan berterusan dan inovasi dalam industri takaful

Kata kunci: TakaTech, Sikap, Norma Subjektif, Kelebihan Relatif, Celik Kewangan tecknology

1. Introduction

The digital ecosystem and the Internet of Things (IoT) evolution remain prominent topics in the business world. The financial industry is profoundly transforming, embracing the next phase of digital evolution. Various challenges, including rising costs, the need for swift responses, a competitive business environment, and more compel this transformation. Additionally, the recent health crisis, the COVID-19 pandemic, has exerted immense pressure on technological capabilities, necessitating adaptation to the "new normal." Financial institutions are adjusting their business models to meet evolving client demands.

The COVID-19 pandemic has disrupted supply chains and business operations, affecting the financial industry. Implementing movement control orders, or "MCO," to contain the spread of COVID-19 has accelerated many businesses' adoption of digital channels. In response, the financial industry embraces disruptive technology, encompassing modern movements and innovative business models. As defined by Bower and Christensen (1995), disruptive technology disrupts the conventional functioning of businesses, consumers, markets, or entire industries. Disruptive technologies that significantly impact human life include artificial intelligence, the Internet of Things, blockchain technology, virtual or augmented reality, and smart contracts.

Within the financial sector, disruptive technology is often referred to as financial technology, or "FinTech." FinTech represents innovative financial services emerging from technological advancements to enhance efficiency and effectiveness in the financial industry, as Huei et al. (2018) noted. This new technology offers transparency, trustworthiness, efficiency, availability, and asset integrity through blockchain ledgers, as outlined by Abdeen et al. (2019). These features are particularly crucial in the takaful and insurance industry, which involves multiple parties and intricate processes. Conventional business practices in this sector are often seen as costly and ineffective due to environmental impact, human errors, and poor communication. In contrast, Abdeen et al. (2019) suggest that blockchain technology holds great promise for improving the takaful system's performance, efficiency, and transparency.

At present, takaful and insurance companies are increasingly interested in integrating technology into their products and services. According to Statista (2020), insurance companies worldwide are making substantial investments in technologies such as cybersecurity, robotic process automation, artificial intelligence, blockchain, and digital channels. This trend reflects the investment industry's and market's readiness to embrace technology in their offerings, aligning with Alshammari et al.'s (2019) recommendation for the takaful and insurance sectors to invest in new technologies to optimise resource utilisation. Furthermore, Eling et al. (2021) highlight that adopting IoT and artificial intelligence in the

insurance market is still in its early stages, with limited business model development.

This study presents the concept of "Takaful Technology" or "TakaTech," which refers to providing Takaful products and services solely through technology. In this work, we will designate it as TakaTech. Significantly, there is a lack of studies investigating the adoption of TakaTech from the consumer's standpoint, specifically within the Malaysian setting. This research aims to close the existing gap and establish a thorough framework for identifying the crucial elements that influence the adoption of TakaTech in Malaysia. This research expands upon the Theory of Reasoned Action by integrating relative advantage and fintech literacy as crucial aspects that deepen our comprehension of TakaTech adoption and contribute to the current knowledge base. Through the analysis of these variables, our objective is to provide valuable information that can guide policymakers and market participants in enhancing their approaches to encourage the use of TakaTech by consumers. The next sections of this work are structured as follows: Section 2 explores the main elements of TakaTech adoption, providing detailed explanations of the underlying concepts. Section 3 introduces the conceptual model, which explains how relative advantage and fintech literacy are integrated into the expanded Theory of Reasoned Action. The last section of the paper involves a comprehensive analysis that emphasises the consequences of the results, recognises the constraints of the study, and proposes potential directions for future investigation. This research aims to enhance the understanding of TakaTech adoption and its implications for technology integration in the takaful sector.

2. Literature review

In 1975, Fishbein and Ajzen formulated the Theory of Reasoned Action, which asserts that an individual's behavioural intention is influenced by attitude and subjective norms. Over the years, the Theory of Reasoned Action (TRA) has been studied extensively, especially in technology research. Several studies (Albar & Hoque, 2019; Amin, Abdul-Rahman et al., 2014; Mital et al., 2016; Mohd Thas Thaker et al., 2018) have provided empirical support for TRA. However, to improve the predictive power of TRA concerning system usage, further modifications are necessary. In the context of TakaTech adoption, this study aims to explore TRA in greater depth. The discussion will focus on the original TRA constructs, namely attitude and subjective norm, followed by examining the relevance of relative advantage and FinTech literacy.

2.1 Attitude

Behavioural intention (BI) refers to an individual's inclination to engage in different behaviours (Fishbein & Ajzen, 1975). BI represents a person's willingness to move from intent to action. The Theory of Reasoned Action (TRA) suggests that BI is the most significant predictor of actual behaviour. This concept was originally introduced in the Theory of Planned Behaviour (Ajzen, 1991a) and the Theory of Reasoned Action (Fishbein & Ajzen, 1975) as an extension of the Technology Acceptance Model (TAM) (Davis et al., 1989). Albar and Hoque (2019) enriched the conceptual landscape by including attitudinal determinants to examine the acceptance of e-health services among patients in Saudi Arabia. Their study developed a framework based on TAM and the Theory of Planned Behaviour (TPB). The findings highlighted the significant influence of perceived usefulness, perceived ease of use, attitude, and subjective norm on BI regarding the utilisation of e-health services.

Ching et al. (2020) introduced the Diffusion of Innovation (DOI) Theory in their investigation of InsurTech adoption within the insurance sector. Their model included five pivotal technological factors: relative advantage, compatibility, complexity, observability, and trialability. However, Ching et al. (2020) emphasised the need for further empirical validation of their model. Jong Pil and Song (2018) used the Unified Theory of Acceptance and Use of Technology (UTAUT) to predict consumer acceptance of blockchain-based insurance services from a Korean perspective. The social influence and promotional conditions showed no significant impact on intention. Similarly, Salem and Ali (2019) proposed an adoption model for blockchain technology, extending the Unified Theory of Acceptance and Use of Technology (UTAUT). These researchers highlight that adopting blockchain technology is still a relatively unexplored area, characterised by ongoing discourse and exploration.

Researchers have shown a keen interest in understanding how consumers adopt new technologies (Eling et al., 2021). Previous studies have examined several factors influencing the adoption of InsurTech or TakaTech. However, this study primarily focuses on attitudinal factors such as attitude, subjective norms, relative advantage, and FinTech literacy. Many studies have explored the complexities of behavioural intention and technology adoption, including research by Liébana-Cabanillas et al. (2018), Roy et al. (2018), and Teo & Beng Lee (2010). In sum, adopting consumer technology is an increasingly popular area of investigation.

2.2 Subjective norm

The second antecedent of TRA is the subjective norm. It refers to the influence that significant individuals such as family, close friends, or coworkers can have on someone's decision to engage in a specific behaviour. This concept focuses on how people perceive the social pressure to engage in or avoid a particular behaviour. (Fishbein & Ajzen, 1975; Venkatesh & Davis, 2000).

Numerous studies have explored the connection between subjective norms and behavioural intention (Alqasa et al., 2014; Bhattacherjee, 2000; Gopi & Ramayah, 2007; Hasbullah et al., 2016; Huda et al., 2012; Shabrina & Zaki, 2019). Subjective norms significantly impact social behaviours, particularly in the workplace, where people strive to maintain their sense of belonging and personal connections within workgroups (Husted & Allen, 2008). Studies by Cheng et al. (2006) and Salem and Salem (2018) have clearly highlighted the importance of subjective standards in understanding complex consumer behaviours.

In their research, Shabrina and Zaki (2019) delved into the impact of subjective norms on people's attitudes towards online shopping. Their findings align with the work of Gopi and Ramayah (2007), who studied the influence of subjective norms on online trading and revealed a positive correlation between subjective norms and the desire to engage in Internet stock trading, as evidenced by multiple regression analysis. Keng-Soon et al. (2019) also noted that subjective norms are crucial in shaping consumers' adoption of technological innovations, such as FinTech services. Collectively, these studies highlight the significant role those subjective norms play in shaping consumer behaviour and attitudes in the context of online activities and technological adoption.

According to Raza et al. (2019), people often turn to their social circle for advice on new technologies and their choices may be influenced by the perceived importance placed on them. Consequently, TakaTech is expected to influence subjective norms, especially given the similarity between takaful technology and conventional insurance technology. In summary, personal beliefs play a significant role in people's actions across different scenarios, such as work or purchasing decisions, especially when it comes to adopting new technology. Given its similarities to traditional insurance technology, it would be valuable to explore further the relevance of TakaTech in relation to these convictions.

2.3 Relative advantage

Relative advantage is crucial in determining the acceptance of new inventions and innovations. Rogers first introduced the term in 1962 in his 'Diffusion of Innovation' book and defined it as "the degree to which an innovation is perceived as better than the idea it replaces" (Rogers, 2003). Relative advantage is commonly associated with studies investigating consumer perceptions and attitudes toward adopting new products, services, and concepts. Various research has shown that relative advantage significantly influences innovation adoption, including the adoption of clean technology (Dincbas, Ergeneli, & Yigitbasioglu, 2021), online proctored exams (Raman et al., 2021), WeChat Pay adoption by foreigners in China (Mombeuil & Uhde, 2021), hospital information systems (Shahzad et al., 2018), e-commerce adoption among SMEs (Zainuddin et al., 2018; Sin et al., 2016), electronic channels for auto insurance transactions (Choudhury & Karahanna, 2008), and group support system meetings (Karahanna et al.,

2002).

In addition to improving understanding of innovation, relative advantage has been linked to a range of positive outcomes, including increased technology compatibility, reduced resource consumption, and easier regulatory compliance (Dincbas, Ergeneli, & Yigitbasioglu, 2021). Shahzad et al. (2018) have also noted that adopting innovative technologies with relative advantages can decrease operating costs. As such, it is vital to consider relative advantage as a key factor influencing customer preferences and selection decisions. Businesses and service providers should consider this as a critical element, as demonstrated by (Zainuddin et al. 2018; Sin et al. 2016) to expedite the adoption rate. The adoption rate is crucial for business strategy, as it affects market share, sales, and profit forecasting, which, in turn, impacts production planning.

Choudhury and Karahanna (2008) operationalised the relative advantage construct by incorporating dimensions such as convenience, trust, and efficacy of information acquisition in their investigation of electronic channel purchases within the auto insurance domain. Conversely, Dincbas, Ergeneli, and Yigitbasioglu (2021), Habiboğlu, Öztek, & Pirtini (2020), and Shahzad et al. (2018) have collectively classified relative advantage, in conjunction with complexity and compatibility, as integral technological sub-dimensions impacting the adoption of clean technology and hospital information systems, respectively. These extensive studies concur that, for facilitating innovation adoption, particular emphasis must be placed on relative advantage as a decisive technological factor instead of being viewed primarily as an organisational or environmental element. Moreover, the preceding empirical insights by Choudhury and Karahanna (2008) underscore the pivotal role of information gathering and transaction execution as pivotal stages in consumer adoption decisions.

Conversely, in a study on the adoption of electronic payments, Mombeuil and Uhde (2021) ascertained that relative convenience, relative advantages, perceived privacy, and perceived security positively influenced the intention for continuous usage. Consequently, it is advisable to focus on the technological dimension when considering the relative advantage of innovation. This entails reinforcing essential efficacy information, enhancing transaction execution ease, and providing assurances regarding security. Noteworthy findings by Shahzad et al. (2018) underpin relative advantage as the preeminent factor influencing the adoption of hospital information systems within public hospitals in Pakistan. Similarly, Sin et al. (2016) and Zainuddin et al. (2018) established a significant and robust association between relative advantage and the adoption of e-commerce among Small and Medium-sized Enterprises (SMEs) in their respective research areas within the northern state of Malaysia and the Klang Valley. It is reasonable to conclude that relative advantage is a highly pertinent factor that should be integral to research concerning innovation adoption, as supported by numerous studies.

2.4 Fintech literacy

Financial Technology, commonly called FinTech, represents a technological advancement that has revolutionised the financial industry (Philippon, 2016). Not only has it changed the industry's structure, but it has also revolutionised the way established firms provide financial products and services. FinTech encompasses cryptocurrencies, blockchain technology, big data, smart contracts, artificial intelligence, machine learning, and peer-to-peer crowdfunding. In this study, we define "FinTech Literacy" (FL) as an individual's ability to understand and interpret the use of emerging technological innovations in financial products and services. For example, understanding the role of crowdfunding in launching a startup business is an essential aspect of FL.

The use of FinTech in the insurance and takaful industries has grown significantly in recent years. Researchers have been studying this trend and its effects. The main goal of this study is to provide insights into the emergence of TakaTech. We have identified several FinTech innovations that can greatly improve the takaful industry by increasing efficiency, transparency, and accessibility for consumers. The study includes Table 2.1, which provides a detailed account of the innovative practices in the FinTech sector.

No.	FinTech Innovation	Definition and Features	Application in Takaful Industry
1.	Blockchain	Blockchain combines several technologies like blockchain data structure, public-key cryptography, distributed ledger, and consensus mechanism (Parker & Fatima, 2018). Blockchain offers an open and decentralised platform technology that enables robust, transparent, and secure data records (Hans et al., 2017).	• Blockchain could optimise efficiency, security, and transparency. • The Distributed Ledger Technology (DLT) could streamline insurance claims, speed up payment, and boost cybersecurity protocols.
2.	Artificial Intelligence	Artificial intelligence (AI) defines an intelligent machine that can think like humans (Mat Rahim et al., 2018). AI is deep learning that imitates human thinking, learning, and cognition (Lake et al., 2017).	• **The explosion of data from connected devices like fitness trackers, smartphones, and smartwatches helps takaful operators understand their clients better.** • **The open-source data ecosystem and advances in cognitive technologies enable new product categories and engagement techniques to shift the underlying risk and behaviours in real time.**
3.	Smart Contract	Smart contracts work as programmed without interruption, deception, control, or third-party interference (Kim & Laskowski, 2018). Smart contracts provide automated approvals, calculations, and other transacting activities prone to lag and error (Chu et al., 2016).	• Smart contracts can eliminate intermediaries and complexity in value exchange. • They can increase efficiency, transparency, and lower uncertainty in the contract and contracting parties. • Smart contracts could automatically transfer the testator's money or assets to the beneficiary in case of death.
4.	Big Data	Big data refers to data sets and analytical techniques in large and	• Operators can collect, manage, analyse, and report

		complex applications. It requires advanced and unique data storage management, analysis, and visualisation technologies (Chen et al., 2012). The holistic definition of big data analytics consists of the 5V data-related dimensions (i.e. volume, variety, velocity, veracity, and value) (Fosso Wamba et al., 2017).	data rapidly and accurately. - Operators can assess customers' demand, needs, target products, and services. - Big data also supports underwriting decisions and can reduce the cost of fraudulent takaful claims.
5.	Chatbot	Chatbot is a new communication application that supports automated inquiries, providing real-time responses for customers (Ching et al., 2020). Chatbot offers automated written or verbal responses to customers' queries (Eling et al., 2021).	- Chatbot solutions provide innovation and real added value for the takaful industry, enhancing consumer engagement with less reliance on human interaction. - Chatbots can provide quotes, 24/7 services, and help takaful companies process new claims. Chatbots offer a cheaper, responsive, and user-friendly solution for customers and operators.

Table 0.1: FinTech Innovation in TakaTech Application

3. Conceptual framework

The study's conceptual framework is based on attitude, social pressure, relative advantage, and FinTech literacy in relation to TakaTech adoption. Figure 3.1 illustrates the conceptual framework of the study.
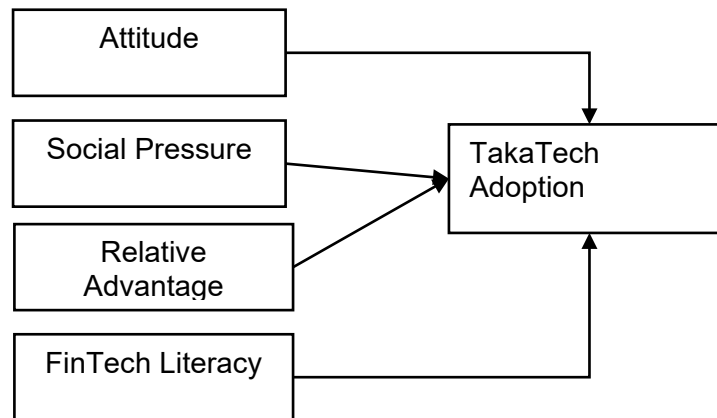

Figure 0.1: Conceptual Framework

4.Conclusion

Insurtech has sparked innovations in the insurance sector. Takaful can follow suit with Insurtech to attract more customers and become more competitive in the market. This study successfully established a discussion on Takaful Technology (TakaTech), which represents the next level of development in the Takaful industry. With the rapid growth of online channels, the insurance sector has made significant gains in areas such as insurance inclusion, efficiency improvement, experience optimisation, and product innovation. TakaTech is rapidly gaining traction as a major driver of industrial innovation. As a result of TakaTech, new applications will flourish in various business processes, from pricing and underwriting to distribution and claims, and the industry's innovative capabilities will reach new heights. This study proposes a framework for investigating factors affecting TakaTech adoption in Malaysia, building on TRA.

As we end our discussion, it is important to highlight the significant implications of these advancements beyond technological innovation. The integration of TakaTech is set to improve efficiency within the takaful sector by automating processes, reducing operational costs, and enabling data-driven decision-making. These improvements in efficiency are set to make takaful providers more competitive in the evolving market landscape and result in a substantial increase in productivity.

In addition, TakaTech offers seamless integration with current digital advancements and caters to the tech-savvy preferences of its customers. The fusion of Islamic principles and technology provides an attractive solution for individuals seeking products that align with their faith while utilising the benefits of modern digital platforms. Furthermore, implementing TakaTech yields a balanced approach to growth and risk management. By incorporating advanced analytics, predictive modelling, and data-driven risk assessment, takaful providers can operate with greater accuracy and stability, resulting in a more sustainable long-term strategy. Incorporating technology into the takaful industry is a significant development that adds a human touch to insurance. This transformation prioritises customer involvement, customised service provision, and solutions focusing on the user. Consequently, clients will benefit from greater transparency and feel empowered and confident in their takaful providers, leading to enduring relationships.

This study provides valuable insights into consumer perspectives on TakaTech adoption, which can serve as a benchmark for managers. It highlights the importance of aligning future products and services with customer demand. However, it is important to note that this research is still in its early stages and has limitations, such as the inability to analyse certain variables. As such, further empirical evaluations, such as case studies, are planned. Additionally, more research is needed to determine whether Takaful organisations will be willing to invest in Takatech.

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