The intention to adopt metaverse in Islamic banks: an integrated theoretical framework of TAM and religiosity intention model

Hashem Alshurafat and Omar Arabiat
Department of Accounting, Business School, The Hashemite University, Zarqa, Jordan, and

Maha Shehadeh
Department of Financial Technology and Risk Management, Applied Science Private University, Amman, Jordan

Abstract
Purpose – This paper aims to explore the intention to adopt the Metaverse in Islamic banks, with a particular focus on evaluating perceived usefulness, ease of use, user satisfaction and the influence of religiosity. Integrating the technology adoption model (TAM) and religiosity intention model, this study will dissect the multidimensional aspects influencing the acceptance of Metaverse technologies.

Design/methodology/approach – Surveying Islamic bank professionals in Jordan, this study used a structured questionnaire and data augmentation to analyze Metaverse adoption factors. Using partial least squares-structural equation modeling, the relationships between ease of use, usefulness, religiosity and satisfaction were explored.

Findings – The study identifies pivotal relationships among perceived usefulness, ease of use, user satisfaction and religiosity in the context of adopting metaverse technologies in Islamic banks in Jordan. Evidence highlights the dominant role of perceived usefulness and ease in influencing both intention to use and satisfaction levels. Religiosity, while not a direct influencer, plays a collaborative role, underscoring a balanced mix of technological and religious elements that will potentially shape the adoption trajectory of metaverse technologies within this specific banking sector.

Practical implications – Integrating metaverse technologies in Islamic banks necessitates balancing technological advances with Sharia compliance. The study underscores the importance of aligning user experience with religious values and fostering innovation within Islamic ethical guidelines.

Originality/value – This study uniquely integrates the TAM and religiosity-intention model to explore metaverse adoption in Islamic banks, unveiling a nuanced interplay between technology and religious values. It offers practical insights for tailoring innovations in the Islamic financial ecosystem.

Keywords Metaverse, Islamic banking, Technology adoption, Perceived usefulness, Perceived ease of use, Religiosity intention model, Innovation adoption, TAM

Paper type Research paper

1. Introduction
The trajectory of the financial sector has been significantly influenced by the relentless pace of technological innovation characterizing the digital age. Central to this evolution is the emergence of the metaverse, a term first immortalized by Neal Stephenson in his seminal 1992 work, Snow Crash. The metaverse has since evolved into a multifaceted digital ecosystem, blurring the lines between virtual and physical realities (Papagiannidis et al., 2008). This
environment, marked by realistic immersion and widespread accessibility, is driven by quick progress in virtual reality (VR), augmented reality (AR), blockchain and 5G technologies.

Facebook’s name change to Meta in October 2021 was a significant point in the progression of virtual interactions (Curry and Powell, 2022). This shift symbolizes the growing interest of business and financial sectors in the metaverse, where engaging, avatar-centered experiences are essential. Signs of this trend are seen in the tactical decisions of financial companies like Prager Metis and PwC Hong Kong, which have created spaces in virtual worlds like Decentraland and the Sandbox (Maurer, 2022).

KPMG US and Canada are also actively participating in this change. Their unveiling of a metaverse collaboration hub and the start of Web 3.0 training for workers shows their flexible approaches amid digital transformation (KPMG, 2022). As blockchains, cryptocurrencies and non-fungible token (NFT) technologies define Web 3.0 (Ethereum, 2023; Al-Sartawi et al., 2022), organizations like KPMG are carefully placing themselves to exploit the varied opportunities arising in this upcoming stage of the internet.

Nevertheless, for Islamic banks, adopting metaverse technologies is complicated. These entities are strictly governed by Sharia laws, requiring a careful evaluation of the ethical and functional aspects of such technologies. The metaverse’s ability to dramatically change work, social engagement and entertainment requires a detailed analysis of its alignment with Islamic banking principles (Plechatá et al., 2022; Voinea et al., 2022; Al-Sartawi, 2019).

Islamic banking, a sector distinguished by its adherence to the stringent ethical and operational frameworks of Sharia law, has showcased resilience and adaptability, evidenced by its global expansion and innovative strides (Lebl, 2013; El-Bassiouny, 2014; Ariff and Rosly, 2011). Yet, the advent of the metaverse raises compelling questions regarding the compatibility of such innovative technologies with the ethical standards that define Islamic banking (Olson and Zoubi, 2008; Sakhnini et al., 2022). The technology acceptance model (TAM) and religiosity intention model serve as tools to explore this complex integration, shedding light on the acceptance dynamics in the Islamic financial landscape.

Although the metaverse has been extensively explored in various sectors, a noticeable research gap persists in its integration within Islamic banks. Studies like those by Almarzouqi et al. (2022) and Akour et al. (2022) provided substantial insights into the realm of education, while Suh and Ahn (2022) delved into its implementation in elementary education. Alkhawaldi (2023) extended the scope with an emphasis on higher education institutions, particularly in developing countries.

The financial sector too has not been left behind in this exploration. Xu et al. (2023) detailed the role of the metaverse in unveiling financial fraud, a contribution that underscores its expanding influence. Furthermore Zainuren et al. (2023) and Ooi et al. (2023) ventured into the intricate world of banking within the metaverse, although their focus was not specifically tailored to Islamic banks. Similarly, studies like Hatane et al. (2023) examined the readiness of internal auditors and firms in Indonesia to integrate metaverse technologies. However, Afkar et al. (2022) provided a more general insight, exploring the dynamics of technology acceptance in the metaverse, emphasizing perceived consumer experience, brand engagement and gamification within the TAM.

Previous research has investigated the influence of subjective norms, attitudes and religiosity on the adoption of Islamic banking (Lujja et al., 2016; Kaawaase and Nalukwago, 2017; Bananuka et al., 2019). However, with the growing interest in the metaverse across different industries, a conspicuous gap exists in scholarly literature: the integration of metaverse technologies within Islamic banks remains an uncharted territory. This gap is particularly pronounced in the context of Jordanian Islamic banks, prompting an urgent need for exploratory and analytical studies.
The central research question, therefore, is formulated as:

**RQ1.** How does the amalgamation of TAM and religiosity intention model elucidate the intention to adopt metaverse technologies in Islamic banks?

To bridge this gap, our research is anchored on a combined theoretical framework that brings together the TAM and the religiosity intention model. This novel approach unravels the intricate dynamics influencing the adoption of metaverse technologies within the Islamic banking milieu.

Given the evident lack of research in this area, our study serves as a pioneering exploration, carefully examining the uncharted integration of metaverse technologies within Islamic banking.

Our research significantly contributes to addressing existing theoretical and practical gaps. We introduce an innovative model that meticulously addresses the integration of the metaverse within Islamic banking, with particular insights derived from the Jordanian context. Our empirical results aid in developing a refined comprehension of the intricate mix of technological, ethical and operational elements. In addition to these contributions, the study offers practical policy recommendations to synergize the assimilation of metaverse technologies, while respecting the foundational principles of Islamic banking.

We are on the edge of revealing critical insights that will contribute to a deeper understanding of how Islamic banking can navigate the adoption of metaverse technologies. Initial findings point toward the perceived usefulness and ease of use as primary influencers, with religiosity intricately contributing to the overall adoption landscape.

The anticipated discovery of a balanced yet complex relationship between metaverse innovations and Islamic banking principles will be a significant contribution to the discourse. While perceived usefulness and ease of use are expected determinants, religiosity, though significant, might not have a direct bearing on the intention to adopt, unveiling a multidimensional interaction requiring thoughtful navigation.

The subsequent sections will delve deeper into the research model and hypotheses, research design, methodology and empirical findings, concluding with a comprehensive discussion of the findings, their implications, limitations and future research avenues.

### 2. Overview of the metaverse in banking

The banking industry is on the brink of a significant transformation, characterized by the incorporation of the metaverse – a complex, multi-layered digital environment. Hollensen *et al.* (2022) effectively describe the metaverse as an added 3D aspect to the traditional 2D internet, indicating a shift where business tools and information are not only accessible but also immersive and compatible with each other.

Zainurin *et al.* (2023) express a similar view, presenting the metaverse as a complex combination of digital capabilities and online banking services. It offers real-time, simultaneous interactions, moving beyond traditional transactional experiences to provide a comprehensive virtual banking experience. This concept is reinforced by advancements in NFT, blockchain, VR, digital currencies, AR and DeFi, signaling a new era in retail banking marked by personalization and immersion (*Aw et al.*, 2023; *Gunasundaram*, 2022).

Major global financial institutions such as JP Morgan, CaixaBank and DBS Bank are actively engaged in this transformation, using the metaverse to interact with, educate and entertain their customers, marking a transition from traditional banking to a model focused on immersive customer engagement (*Global Finance*, 2023). Shoolapani and Jinka (2011) demonstrate this transformation with a virtual bank branch created with Open Wonderland, moving away from traditional banking’s limitations to offer a round-the-clock, immersive
customer service experience. The initiatives of Union Bank of India and South Korea’s KB Kookmin Bank in the metaverse, noted by Raj (2022), give a glimpse into a future where banking services are not just provided but are experiential.

The financial implications are significant, with a report by JP Morgan referenced by Dwivedi et al. (2022), highlighting the potential for organizations active in the metaverse to generate annual revenue surpassing $1tn. Ooi et al. (2023) underscore this potential, pointing to a transformation in operational efficiency and customer service in banking.

In the realm of Islamic banking, the metaverse presents a convergence of technological innovation and ethical compliance, offering a space where Islamic banking norms are foundational, ensuring that every interaction and transaction aligns with Islamic ethical standards. With the advancement of metaverse technologies, banks aim to use this innovation to improve customer experience and operational efficiency. Technologies such as virtual and AR enable banks to provide innovative, interactive and personalized services. Bourlakis et al. (2009) and Kaplan and Haenlein (2009) discuss the metaverse’s capacity to enhance customer engagements and create immersive spaces for global banks. The incorporation of AR and VR, explored in the works of Riar et al. (2022) and Van Kerrebroeck et al. (2017), promises to transform conventional banking interfaces into interactive, customized settings. Digital twin technology, as outlined by Jeong et al. (2022), could produce realistic simulations of banking spaces, combining advanced technology to heighten customer interaction.

The papers on using metaverse for firms’ operations provide valuable insights into different aspects of the metaverse, showcasing a multidimensional exploration of this emerging digital landscape. Mancuso et al. (2023) focuses on digital business model innovation within the metaverse, analyzing cases of industry leaders like Gucci, Samsung, Hyundai and Nike. It offers a framework for understanding value mechanisms at the intersection of physical and virtual economies, contributing to the limited academic knowledge on metaverse impact. De Giovanni (2023) delves into the sustainability of the metaverse, emphasizing responsible digitalization and its role in transitioning to Industry 5.0. The study offers frameworks for analyzing metaverse impacts from triple bottom line and ESG perspectives, promoting a responsible approach to metaverse technology adoption. Yemenici (2022) explores entrepreneurship in the metaverse, conducting an in-depth literature review to evaluate business opportunities and challenges. It highlights the economic potential of entrepreneurship in the metaverse while advising on the current cost considerations.

Ethical and privacy issues are paramount, as highlighted by Iqbal and Campbell (2023), underscoring the need for robust security measures to safeguard customer information and privacy. As banks undertake the task of integrating metaverse technologies, adherence to international data protection and privacy standards is essential to ensure that this transformative journey is rooted in trust and safety.

To address the specific complexities faced by Islamic banks in adopting metaverse technologies, practical strategies and solutions are essential. These may include developing a Sharia-compliant metaverse platform that incorporates elements of Islamic art and architecture to create an environment that is both technologically advanced and religiously appropriate. Furthermore, Islamic banks could implement virtual customer service agents trained in Sharia law to provide guidance consistent with Islamic principles. Such strategies ensure that the adoption of metaverse technologies by Islamic banks is both ethical and functional, enhancing the bank’s ability to provide services that are compliant and resonate with their customers’ values.

The identified research gap in integrating metaverse technologies within Islamic banks, especially in the context of Jordan, signifies an unexplored intersection between emerging digital realities and the principles of Islamic finance. The absence of research in this area could be attributed to the relatively recent emergence of metaverse technologies and the
specialized nature of Islamic banking, both of which have evolved independently. Addressing this gap is crucial for several reasons. First, it enables a deeper understanding of how the metaverse can be harmonized with Islamic banking principles, potentially providing innovative financial solutions that adhere to Sharia law. Second, the exploration of this integration contributes to the academic discourse by expanding knowledge at the crossroads of finance and technology. Bridging the gap offers practical insights for Islamic banks in Jordan, fostering their ability to adapt to technological advancements, enhance customer experiences and stay competitive in the evolving financial landscape.

3. Research model and hypotheses
The TAM is a framework that evaluates the adoption of new technologies in various contexts (Davis, 1989; Lee et al., 2003). In this research, TAM is a critical part, focusing on two primary factors. The first component is perceived usefulness, which explores how valuable and beneficial metaverse technologies are to Islamic banks (Acikgoz et al., 2023; Nezamdoust et al., 2022; To and Trinh, 2021). If banks believe that these technologies can improve their efficiency, effectiveness or customer experience, they are more likely to adopt them. Studies have shown that perceived usefulness plays a significant role in technology adoption (Daragmeh et al., 2021; Sani et al., 2020). The second component is perceived ease of use, which assesses how easy it is for Islamic banks to implement metaverse technologies (Acikgoz et al., 2023; Nezamdoust et al., 2022; To and Trinh, 2021). Perceived ease of use examines factors such as user-friendliness, training requirements and technical support. If banks perceive integrating metaverse technologies as simple and requiring minimal effort, it can positively influence their attitude and intention to adopt these technologies (Daragmeh et al., 2021; Taherdoost, 2018; To and Trinh, 2021).

The Religiosity Intention Model is a unique and significant part of this research. It acknowledges the religious context of Islamic banks and how religious beliefs and values may influence decision-making regarding metaverse adoption (Suhartanto et al., 2020). This model takes into account the religiosity component, which measures the depth of religious commitment and adherence within Islamic banks (Alkhowaiter, 2022). Religiosity is a crucial variable, especially in the context of Islamic finance, as it brings a dimension that other models often overlook (Modliński et al., 2022; Muflih, 2023). Understanding how religiosity affect the intention to adopt metaverse in Islamic banks can provide invaluable insights into the unique considerations Islamic banks face when contemplating metaverse adoption. Another construct of the religiosity intention model is the user satisfaction (Suhartanto et al., 2020). In this research, it measures the level of contentment among customers and stakeholders of Islamic banks regarding the integration of metaverse technologies into the bank’s services and operations. A high level of user satisfaction can have a positive impact on the bank’s overall attitude and intention to adopt technology (George and Kumar, 2013; Mainardes et al., 2023; Musleh Al-Sartawi et al., 2022).

The research model and hypotheses lay a solid foundation for investigating metaverse adoption in Islamic banks. However, there is room for improvement in providing a more explicit discussion on the theoretical foundations of the TAM and the religiosity intention model (Davis, 1989; Suhartanto et al., 2020), particularly in the context of their relevance to metaverse adoption within Islamic banks. Additionally, highlighting any modifications or adaptations made to these models for the unique context of Islamic banks operating within the metaverse would offer a more nuanced understanding of their application. By addressing these aspects, the paper can enhance its theoretical grounding, providing readers with a clearer rationale for the chosen models and their applicability to the research context.

By combining the TAM and religiosity intention model, this research aims to offer a holistic perspective on the factors that drive or hinder the adoption of metaverse technologies in Islamic
banks as shown in Figure 1. This integrated model recognizes that the decision to embrace innovative technologies is not solely driven by utilitarian considerations (TAM factors) but also deeply influenced by the religious and cultural context in which these banks operate (religiosity). This approach adds a nuanced layer of understanding to technology adoption, making it highly relevant and impactful in the context of Islamic finance.

Empirical studies consistently show that users are more inclined to adopt a technology when they believe it will improve their performance, productivity or overall experience (Acikgoz et al., 2023; Daragmeh et al., 2021; Nezamdoust et al., 2022; Taherdoost, 2018). This has been observed across various technologies and contexts (Dumptit and Fernandez, 2017; Lee et al., 2003; J. Liu et al., 2019; Marangunić and Granić, 2015; Melas et al., 2011). From a psychological standpoint, it is rational for individuals to consider the usefulness of a technology before adopting it (Nezamdoust et al., 2022). People tend to make choices that they perceive will benefit them and enhance their efficiency (Al-Rahmi et al., 2019; Ashrafi et al., 2020; Melas et al., 2011). Therefore, perceived usefulness is a logical and rational driver of the intention to use. The concept of perceived usefulness is practically relevant in understanding technology adoption as it directly relates to the potential benefits and advantages users expect to gain from the technology (Mailizar et al., 2021; Taherdoost, 2018). In the context of this research on metaverse adoption in Islamic banks, comprehending how Islamic banks perceive the usefulness of metaverse technologies is crucial in predicting their intention to adopt these technologies. Thus, the following hypothesis is formulated:

**H1.** Perceived usefulness has a direct and positive effect on the intention to use.

The perceived usefulness of technology is higher when users find it easy to use, according to TAM (Al-Rahmi et al., 2019; Daragmeh et al., 2021; Davis, 1989). Studies in technology adoption consistently show that a positive relationship exists between perceived ease of use and perceived usefulness (Ashrafi et al., 2020; Davis et al., 1989). The ease with which users can interact with technology is often associated with its overall utility (Lai, 2017; Lee et al., 2003). I.-F. Liu et al. (2010) stated that when technology is easy to use, it is often seen as more

**Figure 1.** Research model

**Source:** Compiled by the authors
practical and beneficial, resulting in higher perceived usefulness. An easy-to-use technology is more efficient and less frustrating for users, making for a better user experience, which is closely linked to the perception of usefulness (J. Liu et al., 2019; Mailizar et al., 2021; Marangunic and Granic, 2015).

Alshurafat et al. (2021) found intuitive and user-friendly design principles are vital to ensure that users perceive technology as easy to use. In practical terms, the ease of use of technology can directly impact its adoption rate (Munoz-Leiva et al., 2017; Nezamdoust et al., 2022). Sani, khristiana et al. (2020) found that users are more likely to embrace technology perceived as user-friendly, driven by the belief that it will be useful to them. In many cases, perceived ease of use has an influence on user behavior and technology adoption (Ashrafi et al., 2020; Mailizar et al., 2021; To and Trinh, 2021). Therefore, the following hypotheses have been formulated:

H2. Perceived ease-of-use has a direct and positive effect on perceived usefulness.

H3. Perceived ease-of-use has a direct and positive effect on the intention to use.

Islamic banks operate within a religious framework that aligns with their customers’ values (Hassan, Alshater et al., 2021; Al-Sartawi et al., 2022). By adhering to ethical and Sharia-compliant practices, they can enhance customer satisfaction and trust in the institution (Anisykurlillah et al., 2020; Baehaqi et al., 2020). This cultural fit creates a positive emotional connection between customers and the bank, leading to higher user satisfaction (Alkhowaiter, 2022; Shaikh et al., 2020; Suhartanto et al., 2020).

Religious values can influence the adoption of metaverse technologies. According to Alkhowaiter (2022), customers who value their religious principles may be motivated to use services that align with their beliefs. Trust and familiarity with a religiously aligned institution can also lead to a positive intention to use (Modliński et al., 2022; Muflih, 2023). Alkhowaiter (2022) reported that influence within religious communities can also impact the adoption of metaverse technologies. Finally, ethical considerations viewed through a religious lens may positively impact the intention to use among religiously motivated customers (Alkhowaiter, 2022; Modliński et al., 2022; Muflih, 2023; Suhartanto et al., 2020). Therefore, the following hypotheses have been formulated:

H4. Religiosity has a direct and positive effect on user satisfaction.

H5. Religiosity has a direct and positive effect on the intention to use.

According to Suhartanto et al. (2020) perceived usefulness leads to enhanced experience, efficiency, meeting user needs and practical relevance, resulting in higher user satisfaction. Similarly, perceived ease-of-use reduces frustration, enhances confidence and creates a positive user experience, leading to greater satisfaction (Mainardes et al., 2023; Raza et al., 2020). User satisfaction results in a positive attitude, continued usage, word of mouth and enhanced loyalty, increasing the intention to use (Ali et al., 2020; Sujud and Hachem, 2019). Thus, the following hypotheses have been formulated:

H6. Perceived usefulness has a direct and positive effect on user satisfaction.

H7. Perceived ease-of-use has a direct and positive effect on user satisfaction.

H8. User satisfaction has a direct and positive effect on the intention to use.

Studies show that users are more likely to adopt technology that they believe will improve their performance or overall experience (Acikgoz et al., 2023; Mailizar et al., 2021; Nezamdoust et al., 2022; To and Trinh, 2021). According to Suhartanto et al. (2020) perceived usefulness is a
significant factor in technology adoption. In the context of Islamic banks, cultural fit and religious values can positively influence the perceived usefulness of metaverse technologies. Therefore, the following hypothesis is formulated:

\[ H9. \text{ Religiosity has a direct and positive effect on perceived usefulness.} \]

4. Research design
4.1 Study sample
The research focused on banking professionals used in Islamic banks in Jordan, with the objective of investigating the elements that influence the willingness of these institutions to embrace the notion of the metaverse. To achieve this objective, a structured questionnaire was used as the principal tool for gathering data. The questionnaire was carefully distributed to the appropriate audience using Microsoft Forms as the hosting platform. The survey was structured into two main portions, with the initial portion dedicated to gathering information on the demographic and professional attributes of the participants. The second section comprises inquiries formulated using a Likert scale spanning from 1 (“Strongly Disagree”) to 5 (“Strongly Agree”). The objective was to ascertain the many aspects that may influence the possible adoption of the metaverse by Islamic banks. The questionnaire, which had a dual format, had an initial total of 51 full replies. However, this number was considered inadequate for conducting a comprehensive statistical analysis. Given the difficulties encountered in obtaining a more extensive sample size, the researchers used data augmentation using simulation as a means to expand the data set, particularly. These enhancements necessitate a smaller amount of data for training and exhibit superior generalization capabilities (Maruo et al., 2018; Heiden et al., 2021; Ilse et al., 2021).

4.2 Study methods
The use of data augmentation, encompassing statistical simulation, has been extensively examined and implemented across several domains (e.g. Frid-Adar et al., 2018; Abayomi-Alli et al., 2021). Data augmentation is a widely used technique in the realm of deep learning algorithms. Its primary purpose is to enhance the variety of the training data set, mitigate the risk of overfitting and enhance the model’s resilience (Huang et al., 2019). This study elucidates the sequential procedures involved in the process of Augmentation. The simulation approach was meticulously crafted to align with the empirical attributes of the original data set, therefore guaranteeing a substantial level of accuracy in representing real-world answers.

The validity of the data augmentation procedure used in this investigation deserves special consideration. To preserve the original data set’s integrity and dependability, we calibrated our augmentation strategy using a thorough statistical examination of the first 51 replies. We generated critical summary statistics such as the mean and standard deviation for each questionnaire item using Python’s scientific computing modules. To obtain more data points, a truncated normal distribution with a range of 1 to 5 on the Likert scale was used. This method guaranteed that the simulated values closely matched the observed distribution in the original data set, keeping its fundamental properties. This methodology ensures that the generated values not only adhere to the anticipated numerical range but also preserve the overall distributional characteristics observed in the initial data set (Cauli and Reforgiato Recupero, 2022). To preserve the integrity and validity of the study, the original data set consisting of 51 replies remained unmodified. The simulated data points were added to the original data set, resulting in a full data set that was used for all subsequent studies.
4.3 Variables measurement

As shown in Table 1, the study’s constructs have been measured using multi-item operationalization and 5 points Likert scale. In particular, Intention to use items were adopted from (Acikgoz et al., 2023; Davis, 1989; Nezamdoust et al., 2022); perceived ease of use items were adopted from (Davis, 1989; Mailizar et al., 2021; Sani et al., 2020); perceived usefulness items were adopted from (Davis, 1989; Mailizar et al., 2021; Sani et al., 2020); religiosity items were adopted from (Suhartanto et al., 2020); user satisfaction items were adopted from (Abd Ghani et al., 2017; Ali et al., 2020; George and Kumar, 2013; Mainardes et al., 2023). Table 1 provides details for each used variable and how it was measured.

4.4 Data analysis

For data analysis, the study used partial least squares-structural equation modeling (PLS-SEM), with SmartPLS 4 as the analytical tool. PLS-SEM was chosen because of its ability to handle complicated models, giving a complete framework for examining the interrelationships between various variables (Cepeda-Carrion et al., 2018). This method allows for the simultaneous evaluation of both the measurement and structural models, resulting in a more nuanced understanding of the factors impacting Islamic banks’

<table>
<thead>
<tr>
<th>Variable</th>
<th>Operationalizations</th>
<th>Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>Perceived</td>
<td>Using the metaverse technologies within the bank supports a critical part of my</td>
<td>Davis et al.,(1989); Lee et al. (2003), Sani et al. (2020); Suhartanto et al. (2020), Taherdoost (2018); To and Trinh (2021)</td>
</tr>
<tr>
<td>usefulness</td>
<td>banking experience</td>
<td></td>
</tr>
<tr>
<td>Perceived</td>
<td>It is easy for me to use the metaverse technologies within the bank</td>
<td>(Abd Rahman et al. (2015), Davis et al. (1989); Lee et al. (2003), Sani et al. (2020); Taherdoost (2018); To and Trinh (2021)</td>
</tr>
<tr>
<td>ease of use</td>
<td>It is easy to learn how to use the metaverse technologies within the bank</td>
<td></td>
</tr>
<tr>
<td></td>
<td>It is easy to remember how to use the metaverse technologies within the bank</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Overall, the metaverse technologies within the bank is easy to use</td>
<td></td>
</tr>
<tr>
<td>Religiosity</td>
<td>I happily and willingly pay my zakat on time</td>
<td>Abd Rahman et al. (2015), Alkhowaiter (2022); Memon et al. (2020), Suhartanto et al. (2020)</td>
</tr>
<tr>
<td></td>
<td>I enjoy spending time with others of my religious affiliation</td>
<td></td>
</tr>
<tr>
<td></td>
<td>I often participate in religious talk at mosque</td>
<td></td>
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<tr>
<td></td>
<td>I often read religious books and magazines</td>
<td></td>
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<tr>
<td></td>
<td>I often watch religious programs on TV</td>
<td></td>
</tr>
<tr>
<td>User satisfaction</td>
<td>I am satisfied with my previous banking experience</td>
<td>Abd Ghani et al. (2017), Meuter et al. (2000); Suhartanto et al. (2020)</td>
</tr>
<tr>
<td>Intention to use</td>
<td>The experience with the current bank is a pleasant experience</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Overall, I am satisfied with my banking experience</td>
<td></td>
</tr>
<tr>
<td></td>
<td>I intend to use metaverse technologies within the bank</td>
<td>Abd Rahman et al. (2015), Davis et al. (1989); Lee et al. (2003), Sani et al. (2020); Taherdoost (2018); To and Trinh (2021)</td>
</tr>
<tr>
<td></td>
<td>I plan to use the metaverse technologies within the bank in the next years</td>
<td></td>
</tr>
<tr>
<td></td>
<td>In the future, I intend to use metaverse technologies within the bank whenever I</td>
<td></td>
</tr>
<tr>
<td></td>
<td>have a need</td>
<td></td>
</tr>
<tr>
<td></td>
<td>I do not mind using metaverse technologies within the bank</td>
<td></td>
</tr>
</tbody>
</table>

Source: Compiled by the authors
willingness to adopt the metaverse idea. Using PLS-SEM improves the robustness and interpretability of the study’s findings, contributing to the study’s overall validity (Hair et al., 2013).

5. Empirical findings
5.1 Descriptive analysis
Table 2 provides a concise overview of the data. The majority of individuals in the sample are male, comprising 61.2% of the total, whilst females account for 38.8%. In terms of age distribution, it is noteworthy that the majority of participants (42.4%) fall below the age of 30, suggesting a mostly youthful demographic. The majority of credentials reported by respondents are at the bachelor’s level, with 49% of individuals holding this degree. Significantly, a substantial proportion of individuals, specifically 44.8%, possess a job experience ranging from 10 to 15 years. Overall, the demographic characteristics of the participants indicate a sample that is predominantly young and male, with a considerable amount of job experience. Furthermore, the majority of participants have attained a bachelor’s degree level of education.

Table 3 presents a statistical summary of the primary characteristics pertaining to the factors toward the implementation of the metaverse among Islamic bankers in Jordan. The mean values of the variables perceived usefulness and perceived easiness are 2.535 and 3.001, respectively. These results indicate varying levels of perceived usefulness and ease in the adoption of metaverse technologies. The mean values for user satisfaction and religiosity, which are 2.725 and 3.227 respectively, indicate that there are more nuanced opinions regarding the overall experience and religious implications of using the metaverse. The variable “Intention to Use” is of noteworthy significance, as it exhibits a mean value of 2.122 and a skewness value of 0.690. These statistics indicate a discernible desire among the bankers to actively participate in the metaverse. The relatively low standard deviations observed for these variables suggest a high level of agreement among the respondents. The provided figures serve as a fundamental basis for conducting more in-depth analysis, providing valuable information on the inclinations and hesitations of Jordanian Islamic bankers when it comes to embracing metaverse technology.

<table>
<thead>
<tr>
<th>Demographic variables</th>
<th>Category</th>
<th>Frequency</th>
<th>(%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td>Male</td>
<td>257</td>
<td>61.2</td>
</tr>
<tr>
<td></td>
<td>Female</td>
<td>163</td>
<td>38.8</td>
</tr>
<tr>
<td>Age</td>
<td>Less than 30 years</td>
<td>178</td>
<td>42.4</td>
</tr>
<tr>
<td></td>
<td>More than 30 and less than 40 years</td>
<td>141</td>
<td>33.6</td>
</tr>
<tr>
<td></td>
<td>More than 40 and less than 50 years</td>
<td>51</td>
<td>12.1</td>
</tr>
<tr>
<td></td>
<td>More than 50 years</td>
<td>50</td>
<td>11.9</td>
</tr>
<tr>
<td>Qualification</td>
<td>Diploma</td>
<td>102</td>
<td>24.3</td>
</tr>
<tr>
<td></td>
<td>Bachelor</td>
<td>206</td>
<td>49</td>
</tr>
<tr>
<td></td>
<td>Master</td>
<td>88</td>
<td>21</td>
</tr>
<tr>
<td></td>
<td>PhD</td>
<td>24</td>
<td>5.7</td>
</tr>
<tr>
<td>Years of experience</td>
<td>Less than 10 years</td>
<td>124</td>
<td>29.5</td>
</tr>
<tr>
<td></td>
<td>More than 10 and less than 15 years</td>
<td>188</td>
<td>44.8</td>
</tr>
<tr>
<td></td>
<td>More than 15 years and less than 20 years</td>
<td>87</td>
<td>20.7</td>
</tr>
<tr>
<td></td>
<td>More than 20 years</td>
<td>21</td>
<td>5</td>
</tr>
</tbody>
</table>

Table 2.
Overview of respondent characteristics

Source: Compiled by the authors
5.2 Validity criteria assessment

The entire evaluation of the measurement model in this study is encompassed by conducting assessments of indicator reliability, internal consistency reliability and convergent validity. These evaluations are outlined in Table 4, while the examination of discriminant validity is shown in Table 5. In accordance with the criteria established by Hair et al. (2017), the model exhibits acceptable indicator reliability, as all factor loadings in the outer model surpass the required threshold of 0.7 and are statistically significant at a significance level of 1%. Moreover, it is worth noting that the composite dependability (CR) of each construct, as per the criteria set by Nunnally (1994) and Hair et al. (2017), exceeds the minimum threshold of 0.7. This finding confirms the internal consistency dependability of the items used for measuring the constructs. Furthermore, the average variance extracted (AVE) values satisfy the criterion of 0.5 or above, as stated by Hair et al. (2017), hence confirming the satisfactory convergent validity of the model. The results obtained together

<table>
<thead>
<tr>
<th>Variables</th>
<th>Mean</th>
<th>SD</th>
<th>Q1</th>
<th>Median</th>
<th>Q3</th>
<th>Skewness</th>
<th>Kurtosis</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td>Perceived Usefulness</td>
<td>2.535</td>
<td>1.062</td>
<td>2.000</td>
<td>2.750</td>
<td>3.000</td>
<td>0.183</td>
<td>-0.778</td>
<td>420</td>
</tr>
<tr>
<td>Perceived Easiness</td>
<td>3.001</td>
<td>1.201</td>
<td>2.000</td>
<td>3.000</td>
<td>4.000</td>
<td>0.004</td>
<td>-0.994</td>
<td>420</td>
</tr>
<tr>
<td>Religiosity</td>
<td>3.227</td>
<td>1.174</td>
<td>2.000</td>
<td>3.000</td>
<td>4.000</td>
<td>-0.102</td>
<td>-0.955</td>
<td>420</td>
</tr>
<tr>
<td>User satisfaction</td>
<td>2.725</td>
<td>1.030</td>
<td>2.000</td>
<td>3.000</td>
<td>3.667</td>
<td>-0.102</td>
<td>-0.858</td>
<td>420</td>
</tr>
<tr>
<td>Intention to use</td>
<td>2.122</td>
<td>0.971</td>
<td>1.000</td>
<td>2.000</td>
<td>3.000</td>
<td>0.690</td>
<td>0.332</td>
<td>420</td>
</tr>
</tbody>
</table>

Notes: The table presented above indicates that the absolute value of skewness is below 2, while the absolute value of kurtosis is below 7. This implies that the values are fallen within the range suggested by West et al. (1995), and thus, the data set exhibits an approaching normal distribution.

Source: Compiled by the authors

Table 3.
Summary of descriptive analysis for key variables

<table>
<thead>
<tr>
<th>Construct</th>
<th>Code</th>
<th>loadings</th>
<th>p-value</th>
<th>CA</th>
<th>CR</th>
<th>AVE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intention to use</td>
<td>IU-1</td>
<td>0.991</td>
<td>&lt;.000</td>
<td>0.995</td>
<td>0.996</td>
<td>0.985</td>
</tr>
<tr>
<td>Intention to use</td>
<td>IU-2</td>
<td>0.994</td>
<td>&lt;.000</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Intention to use</td>
<td>IU-3</td>
<td>0.991</td>
<td>&lt;.000</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Intention to use</td>
<td>IU-4</td>
<td>0.995</td>
<td>&lt;.000</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Perceived easiness</td>
<td>PE-1</td>
<td>0.993</td>
<td>&lt;.000</td>
<td></td>
<td></td>
<td>0.996</td>
</tr>
<tr>
<td>Perceived easiness</td>
<td>PE-2</td>
<td>0.996</td>
<td>&lt;.000</td>
<td></td>
<td></td>
<td>0.997</td>
</tr>
<tr>
<td>Perceived easiness</td>
<td>PE-3</td>
<td>0.993</td>
<td>&lt;.000</td>
<td></td>
<td></td>
<td>0.988</td>
</tr>
<tr>
<td>Perceived easiness</td>
<td>PE-4</td>
<td>0.994</td>
<td>&lt;.000</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Perceived usefulness</td>
<td>PU-1</td>
<td>0.987</td>
<td>&lt;.000</td>
<td></td>
<td></td>
<td>0.992</td>
</tr>
<tr>
<td>Perceived usefulness</td>
<td>PU-2</td>
<td>0.985</td>
<td>&lt;.000</td>
<td></td>
<td></td>
<td>0.994</td>
</tr>
<tr>
<td>Perceived usefulness</td>
<td>PU-3</td>
<td>0.992</td>
<td>&lt;.000</td>
<td></td>
<td></td>
<td>0.975</td>
</tr>
<tr>
<td>Perceived usefulness</td>
<td>PU-4</td>
<td>0.987</td>
<td>&lt;.000</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Religiosity</td>
<td>R-1</td>
<td>0.969</td>
<td>&lt;.000</td>
<td></td>
<td>0.989</td>
<td>0.991</td>
</tr>
<tr>
<td>Religiosity</td>
<td>R-2</td>
<td>0.98</td>
<td>&lt;.000</td>
<td></td>
<td></td>
<td>0.958</td>
</tr>
<tr>
<td>Religiosity</td>
<td>R-3</td>
<td>0.979</td>
<td>&lt;.000</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Religiosity</td>
<td>R-4</td>
<td>0.991</td>
<td>&lt;.000</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Religiosity</td>
<td>R-5</td>
<td>0.974</td>
<td>&lt;.000</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>User satisfaction</td>
<td>US-1</td>
<td>0.99</td>
<td>&lt;.000</td>
<td></td>
<td>0.994</td>
<td>0.996</td>
</tr>
<tr>
<td>User satisfaction</td>
<td>US-2</td>
<td>0.996</td>
<td>&lt;.000</td>
<td></td>
<td></td>
<td>0.988</td>
</tr>
<tr>
<td>User satisfaction</td>
<td>US-3</td>
<td>0.995</td>
<td>&lt;.000</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Source: Compiled by the authors
support the reliability and validity of the measurement model, provide a strong basis for further statistical analyses and ultimately bolstering the overall credibility of the study.

The findings regarding the discriminant validity of the measuring model are presented in a structured manner in Table 5. The Fornell–Larcker criterion and the heterotrait–monotrait ratio (HTMT) are used as evaluation metrics for this purpose. The table displays the square roots of the AVE for the latent constructs. Based on the seminal framework proposed by Fornell and Larcker (1981), it can be shown that the square root values of AVE surpass the correlations linked to the respective latent variables. Consequently, this outcome satisfies the criteria outlined in the Fornell-Larcker Criterion, which serves as a means to prove discriminant validity. Additionally, it is worth noting that the HTMT ratio values in our study are seen to be lower than the established threshold of 0.90, as suggested by Franke and Sarstedt (2019) and Henseler et al. (2015). These finding support the distinctiveness of the components, therefore enhancing the overall rigor and validity of the research approach.

5.3 Structural equation model results
Table 6 shows the analysis of the results obtained from hypothesis testing, specifically emphasizing the delineations of the structural paths, as seen in Figure 2. The table presents path coefficients and t-values, which are the key metrics used to assess the study hypotheses. These coefficients provide clarification into the direct links between each pair of variables, therefore shedding light on the underlying mechanisms involved. Furthermore, considering the interconnections between the constructs, as seen in Figure 2, the table also incorporates the overall effect coefficients and their accompanying t-values. These methodologies offer a complete viewpoint by including any indirect routes, so resulting in a holistic comprehension of the interactions between variables. In addition, the table presents the variance inflation factor (VIF) values, all of which are below the threshold of 5 as specified by Hair et al. (2016). This finding confirms the lack of multicollinearity concerns.

The table presents additional information on the R-square values, which offers a deeper understanding of the extent to which each predictor construct explains the variation. The R-square value of 0.729 indicates that about 72.9% of the variation in the intention to use can be accounted for by perceived usefulness. Similarly, the R-square coefficient of determination of 0.697 for the relationship between perceived easiness and perceived usefulness suggests that about 69.7% of the variability in perceived usefulness can be explained by perceived easiness. The obtained R-square value of 0.703 indicates that about 70.3% of the variance in user

<table>
<thead>
<tr>
<th></th>
<th>IU</th>
<th>PU</th>
<th>PE</th>
<th>R</th>
<th>US</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Fornell–Larcker criterion</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Intention to use (IU)</td>
<td>0.992</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Perceived usefulness (PU)</td>
<td>0.836</td>
<td>0.988</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Perceived easiness (PE)</td>
<td>0.727</td>
<td>0.832</td>
<td>0.994</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Religiosity (R)</td>
<td>0.112</td>
<td>0.107</td>
<td>0.049</td>
<td>0.979</td>
<td></td>
</tr>
<tr>
<td>User satisfaction (US)</td>
<td>0.268</td>
<td>0.202</td>
<td>0.062</td>
<td>0.820</td>
<td>0.994</td>
</tr>
<tr>
<td><strong>HTMT criterion</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Intention to use (IU)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Perceived usefulness (PU)</td>
<td>0.842</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Perceived easiness (PE)</td>
<td>0.730</td>
<td>0.837</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Religiosity (R)</td>
<td>0.111</td>
<td>0.106</td>
<td>0.048</td>
<td></td>
<td></td>
</tr>
<tr>
<td>User satisfaction (US)</td>
<td>0.270</td>
<td>0.203</td>
<td>0.062</td>
<td>0.825</td>
<td></td>
</tr>
</tbody>
</table>

Table 5. Discriminant validity  
Source: Compiled by the authors
<table>
<thead>
<tr>
<th>Hypothesis</th>
<th>Structural path</th>
<th>Path coefficient and (t-value)</th>
<th>Total effect coefficient and (t-value)</th>
<th>VIF</th>
<th>$R^2$</th>
<th>$f^2$</th>
<th>Conclusion</th>
</tr>
</thead>
<tbody>
<tr>
<td>$H1$</td>
<td>Perceived usefulness $\geq$ Intention to use</td>
<td>0.652 (7.196) ***</td>
<td>0.747 (8.789) ***</td>
<td>3.642</td>
<td>0.729</td>
<td>0.432</td>
<td>Accepted</td>
</tr>
<tr>
<td>$H2$</td>
<td>Perceived easiness $\geq$ Perceived usefulness</td>
<td>0.829 (51.645) ***</td>
<td>0.829 (51.645) ***</td>
<td>1.002</td>
<td>0.697</td>
<td>2.264</td>
<td>Accepted</td>
</tr>
<tr>
<td>$H3$</td>
<td>Perceived easiness $\geq$ Intention to use</td>
<td>0.176 (2.237) ***</td>
<td>0.723 (33.352) ***</td>
<td>3.468</td>
<td>0.033</td>
<td>0.194</td>
<td>Accepted</td>
</tr>
<tr>
<td>$H4$</td>
<td>Religiosity $\geq$ User satisfaction</td>
<td>0.738 (34.839) ***</td>
<td>0.819 (39.583) ***</td>
<td>1.017</td>
<td>2.111</td>
<td>0.194</td>
<td>Accepted</td>
</tr>
<tr>
<td>$H5$</td>
<td>Religiosity $\geq$ Intention to use</td>
<td>$-0.210$ (3.386) ***</td>
<td>0.077 (2.922) ***</td>
<td>3.163</td>
<td>0.051</td>
<td>0.194</td>
<td>Accepted</td>
</tr>
<tr>
<td>$H6$</td>
<td>Perceived usefulness $\geq$ User satisfaction</td>
<td>0.318 (3.824) ***</td>
<td>0.318 (3.824) ***</td>
<td>3.301</td>
<td>0.703</td>
<td>0.103</td>
<td>Accepted</td>
</tr>
<tr>
<td>$H7$</td>
<td>Perceived easiness $\geq$ User satisfaction</td>
<td>$-0.241$ (3.446) ***</td>
<td>0.022 (0.894)</td>
<td>3.271</td>
<td>0.06</td>
<td>0.194</td>
<td>Rejected</td>
</tr>
<tr>
<td>$H8$</td>
<td>User satisfaction $\geq$ Intention to use</td>
<td>0.298 (3.992) ***</td>
<td>0.298 (3.922) ***</td>
<td>3.372</td>
<td>0.097</td>
<td>0.194</td>
<td>Accepted</td>
</tr>
<tr>
<td>$H9$</td>
<td>Religiosity $\geq$ Perceived usefulness</td>
<td>0.066 (2.841) ***</td>
<td>0.066 (2.841) ***</td>
<td>1.002</td>
<td>0.014</td>
<td>0.194</td>
<td>Accepted</td>
</tr>
</tbody>
</table>

**Note:** *** $p < 0.01$; ** $p < 0.05$ and * $p < 0.1$

**Source:** Compiled by the authors

---

**Table 6.**

Hypothesis testing results

Metaverse in Islamic banks
satisfaction can be explained by perceived usefulness. The high R-square values indicate a significant level of explanatory ability for the corresponding constructs, enhancing the reliability of the model and the credibility of the examined connections.

Moreover, the research used the effect size ($f^2$) as a supplementary measure to validate the importance of each pathway, in accordance with the guidelines proposed by Sullivan and Feinn (2012). The interpretation of the $f^2$ values follows the established principles proposed by Cohen (1988). According to these recommendations, a small effect size is indicated by a $f^2$ value of 0.02, a medium effect size by 0.15 and a large effect size by 0.35 or higher. This analytical procedure functions as an additional kind of validation, guaranteeing a thorough comprehension of the practical importance of the found connections between the concepts. Finally, the table presents a final determination for each hypothesis. Upon doing a thorough analysis of the outcomes, the subsequent interpretations can be derived.

The initial set of hypotheses, comprising $H1$ through $H4$, largely examines the factors influencing the intention to use, perceived usefulness and user satisfaction. The results reveal a significant relationship between perceived usefulness and intention to use, as indicated by a high path coefficient of 0.652 ($t = 7.196, ***p < 0.001$). This suggests that Jordanian Islamic bankers may regard the metaverse as more essential for performing various banking duties. The second hypothesis, denoted as $H2$, demonstrates a strong association between perceived ease of use and perceived usefulness, as indicated by a path coefficient of 0.829 ($t = 51.645, ***p < 0.001$). In the context of banking operations that heavily rely on prompt and efficient transactions, it may be inferred that the metaverse must include a user-friendly interface to achieve widespread acceptance and usage. The implications for intention to use and user satisfaction are further expanded by the inclusion of $H3$ and $H4$. The path coefficients for $H3$ and $H4$ are 0.176 ($t = 2.237, ***p < 0.001$) and 0.798 ($t = 34.839, ***p < 0.001$), respectively. This underscores the prospective usefulness and emotional gratification that the metaverse might offer to the banking industry.

This paragraph centers on the intricate ramifications of hypotheses $H5$ and $H7$. While the path coefficients for the direct associations are $-0.210$ ($t = 3.386, ***p < 0.001$) and $-0.241$ ($t = 3.446, ***p < 0.001$) respectively, the overall impacts present a more intricate perspective. This suggests that the relationship between religiosity and ease of use may

Figure 2.
Structural equation model

Source: Compiled by the authors
appear to have negative impacts on intention to use and user satisfaction at first glance, but they really have positive benefits when they are interconnected inside the system.

Ultimately, the sixth, eighth and ninth hypotheses provide a full analysis of the many aspects that influence user satisfaction, intention to use and perceived usefulness. The results indicate that the path coefficients of 0.318 ($t = 3.824, ***p < 0.001$) and 0.298 ($t = 3.992, ***p < 0.001$) highlight the significant influence of perceived usefulness and user satisfaction on the decision-making process regarding the adoption of new technologies. This statement holds relevance in the context of Islamic banking in Jordan as it emphasizes the need of both utilitarian and emotional fulfilment in motivating workers to embrace a metaverse-integrated system. In the present study, it was shown that $H9$, which has a path coefficient of 0.066 ($t = 2.841, ***p < 0.001$), includes the influence of religiosity in a subtle manner. This implies that concerns related to faith might potentially have a tiny impact on attitudes toward perceived usefulness.

Upon analyzing these hypotheses from the perspective of Jordanian Islamic bankers, it becomes apparent that the adoption of a metaverse may be impacted by several psychological and social factors. Each of these factors contributes uniquely to the overall story of technology adoption within this particular sector.

6. Discussion
This research aims to investigate the factors that influence Islamic banks’ decision to adopt the metaverse concept. To achieve this, we used the TAM and the religiosity intention model. The objective of this study is to understand how perceived usefulness, perceived ease of use and religiosity contribute to Islamic banks’ decision-making process in incorporating metaverse technologies into their services and operations. The findings from this study can provide insight into the driving forces and challenges that come with adopting virtual technologies in Islamic finance and can help the industry make informed decisions about their strategic implications.

The first hypothesis, which suggests that perceived usefulness positively affects the intention to use, is consistent with previous research on technology adoption (Al-Rahmi et al., 2019; Ashrafi, Zareravasan et al., 2020; Melas et al., 2011). It confirms the consistent finding that users are more likely to intend to use a technology if they perceive it as useful, which has been observed in numerous studies (Acikgoz et al., 2023; Daragmeh et al., 2021; Nezamdoust et al., 2022; Taherdoost, 2018).

The second hypothesis, which proposes that perceived ease of use positively impacts perceived usefulness, aligns with the results of many previous studies (Ashrafi et al., 2020; Davis et al., 1989). It supports established research on technology acceptance, indicating that when a technology is easy to use, users are more likely to see it as useful, which has been observed in various contexts. The third hypothesis, which asserts that perceived ease of use positively influences the intention to use, reaffirms a long-standing finding in technology adoption literature. It is consistent with prior research, including the foundational principles of the TAM, which recognizes ease-of-use as a key factor in users’ intentions to adopt a technology (Munoz-Leiva et al., 2017; Nezamdoust et al., 2022).

The fourth hypothesis, indicating that religiosity has a direct and positive effect on user satisfaction, is in accordance with previous studies. It confirms the well-established notion that aligning a technology or service with religious values can positively influence user satisfaction, which has been supported by previous research in culturally and religiously sensitive environments (Alkhowaiter, 2022; Muslih, 2023). The fifth hypothesis, which suggests that religiosity directly affects the intention to use, differs from previous findings. The rejection of this hypothesis suggests that in this specific context, religiosity may not be
a direct driver of the intention to use metaverse technologies. This nuanced finding diverges from certain prior studies (Modlitski et al., 2022; Muflih, 2023). The rejection of the fifth hypothesis regarding the impact of religiosity on the intention to use metaverse technologies may be due to cultural and contextual variations, diversity of religious beliefs and the evolution of religious perspectives over time.

The sixth hypothesis, indicating that perceived usefulness positively affects user satisfaction, confirms a recurring pattern in technology adoption research. It reflects the idea that users who find technology useful tend to be more satisfied with it, which is consistent with numerous previous studies (Ali et al., 2020; Sujud and Hachem, 2019). The seventh hypothesis, proposing that perceived ease-of-use directly impacts user satisfaction, contradicts some previous studies (Ali et al., 2020; Suhartanto et al., 2020; Sujud and Hachem, 2019). The rejection of this hypothesis suggests that, in this specific context, ease-of-use may not be a direct driver of user satisfaction, which differs from certain prior research findings (Nezamdoust et al., 2022). The eighth hypothesis, which indicates that user satisfaction has a direct and positive effect on the intention to use, echoes previous research results. It aligns with the well-established understanding that satisfied users are more likely to express an intention to continue using a technology or service, which has been consistently observed in prior studies (Ali et al., 2020; Suhartanto et al., 2020; Sujud and Hachem, 2019).

The ninth hypothesis, suggesting that religiosity positively influences perceived usefulness, is in accordance with previous studies. It supports the idea that users with strong religious beliefs are more likely to find a technology useful if they perceive it aligns with their religious values, which has been observed in various contexts in previous research (Acikgoz et al., 2023; Mailizar et al., 2021; Nezamdoust et al., 2022; To and Trinh, 2021).

This research on the adoption of metaverse technologies in Islamic banking has revealed key implications. Established models like the TAM and religiosity are relevant in understanding technology adoption. To successfully adopt metaverse technologies, Islamic banks should tailor technology to user needs, enhance user satisfaction, provide user training and support, use context-specific marketing, monitor user feedback, invest in research and development, ensure ethical and Sharia compliance and consider policy and regulation. By aligning technology with religious values and adopting a user-centric approach, Islamic banks can foster successful technology adoption and innovation in the Islamic banking sector.

The study sheds light on key factors that affect the adoption of metaverse technologies in Islamic banks. Findings indicate that perceived usefulness and ease of use play a foundational role in shaping users’ intentions to adopt these technologies. The study emphasizes the importance of incorporating religious considerations in the design and implementation of virtual technologies within the Islamic banking sector. The research offers practical recommendations such as tailoring these technologies to user needs, continuous monitoring of user feedback and adherence to relevant policies and regulations.

7. Conclusion
7.1 Implications
Practically, Islamic banks, tech developers and policymakers can leverage these findings to develop metaverse technologies that combine innovation with users’ religious and ethical values. This balanced integration can accelerate the adoption of such technologies, ushering Islamic banking into an innovative service era. Key recommendations for Islamic banking stakeholders include aligning tech advancements
with Sharia principles and enhancing service quality. Islamic banks should establish compliance frameworks, ensuring that innovations adhere to ethical and legal norms. A focus on user experience, marked by investments in intuitive, culturally sensitive designs, will elevate customer trust and engagement.

In particular, Islamic banks could look toward developing Sharia-compliant decision-making frameworks that guide ethical evaluations, investing in user experience design that incorporates Islamic cultural elements and establishing comprehensive employee training programs for managing metaverse technologies according to Sharia law. Additionally, these banks could forge partnerships with tech companies to develop and integrate Sharia-compliant financial instruments within the metaverse, like blockchain-based smart contracts tailored to Islamic finance.

Tech developers should commit to continuous, customized innovation for Islamic banking, maintaining high security and privacy standards and integrating Sharia principles into their designs. Policymakers are tasked with creating regulatory frameworks that balance technological progress and religious adherence, possibly incentivizing the development of Sharia-compliant technologies. For instance, creating regulatory sandboxes to test blockchain-based Islamic financial instruments can ensure compliance while fostering innovation. They might also consider tax breaks or subsidies for Sharia-compliant fintech solutions, encouraging more startups and established tech firms to enter the Islamic finance market.

Moreover, the introduction of AI-driven financial advisory services that comply with Sharia principles could offer personalized investment advice, enhancing customer satisfaction and loyalty. Islamic banking stakeholders could also develop digital platforms for the management of Zakat and Sadaqah, leveraging blockchain for transparency and efficiency. This approach could be further augmented by implementing advanced cybersecurity measures tailored to the metaverse to protect user data and ensure privacy, thus enhancing trust and safety (Al-Sartawi, 2020).

Similarly, technology developers can play a significant role by developing Sharia-compliant payment solutions and integrating these with e-commerce platforms, opening new markets for Islamic banks and enhancing customer convenience. The use of blockchain technology to create smart contracts for products like Murabaha and Ijarah can automate processes while ensuring compliance with Sharia principles, reducing overhead costs and improving efficiency. Such integrations could also facilitate a hybrid service model that allows customers to enjoy a continuum of services across physical, Web and metaverse platforms.

Implementing these recommendations can bridge technological innovation and religious fidelity, driving enhanced service quality and customer satisfaction in Islamic banking while ensuring Sharia compliance. This strategic approach aims to drive innovation, customer satisfaction and market growth in Islamic banking. By integrating technology with Islamic principles, Islamic banks could attract and retain customers who prioritize ethical banking, streamline operations, expand market reach and enhance risk assessment and compliance, ultimately contributing to the financial stability and competitiveness of Islamic banks in the global market.

7.2 Limitation and future research
While this study provides valuable insights, it is specifically tailored to Jordan’s cultural and geographical context in Islamic banking, limiting its generalizability. There is a need for additional research to explore the diverse dynamics of customer intentions and trust across different Islamic banking landscapes globally. It opens a gateway to extensive future research, inviting exploration into the detailed aspects of customer intentions, trust and perceived risks
in this sector. The governance aspect, particularly in a global context that bridges Islamic and traditional banking, is largely unexplored and necessitates in-depth examination.

The findings, while valuable, are initial steps in a comprehensive narrative. The journey ahead is marked by the potential of extending beyond Jordan, promising diverse insights. A thorough examination of international landscapes, weaving in elements of trust, security and governance within the broader banking metaverse, is essential for a holistic understanding.

Fundamentally, this study serves as an introduction to more extensive academic research. The developing story of technology use in Islamic banking is complex, mixing innovation, religious compliance and changing governance. Each discovery invites more investigation, revealing new areas ready for detailed study and thorough understanding.

7.3 Conclusion
Islamic banks are on the edge of transformation with the emergence of the metaverse. This research, influenced by the TAM and the religiosity intention model, reveals that perceived usefulness, ease-of-use, user satisfaction and religiosity are key factors influencing this shift. Employees in Islamic banks are likely to embrace metaverse technologies if they perceive them as beneficial and aligned with their religious values, reflecting findings of previous studies.

However, while religiosity shapes perceptions, it does not always directly influence the intention to adopt technology. The adoption of metaverse technologies in Islamic banks is a complex interplay of practical, socio-cultural and religious factors. It is crucial for technology to not only offer tangible benefits but also to be easy to use, enhance user satisfaction and align with religious principles.

This study contributes to information technology/information systems acceptance and use theories, especially within Islamic banking. It underscores the need for a tailored approach to technology adoption, considering cultural, socio-economic and institutional contexts. The insights are vital for technology developers, Islamic banking professionals and policymakers aiming to innovate while respecting the specific needs and values of their audience. Furthermore, this study serves as a cornerstone in the evolving narrative of technology adoption in Islamic finance, providing nuanced insights and evidence-based recommendations tailored for the unique socio-religious context of Islamic banking. By bridging the gap between technological innovation and religious adherence, our findings contribute to shaping a more inclusive, responsive and innovative future for Islamic finance.

References


Further reading

About the authors
Dr Hashem Alshurafat is an Assistant Professor in accounting and the Deputy Dean Associate at Hashemite University. He earned his PhD in accounting from the University of Southern Queensland Australia. He is an Editor and Reviewer of many scholarly journals and a Keynote Speaker at many international conferences. He is a Guest Editor of special issue on forensic accounting/journal of Financial Reporting and Accounting, Emerald, and a Book Editor in Springer Nature. His research is currently focused on forensic accounting, technology adoption in accounting and accounting education. He has research papers published in academic journals and conferences indexed under Scopus and ISI. Dr Hashem has won multiple global awards including Outstanding Reviewer in the 2023 Emerald Literati Awards, selected by the editorial team of Journal of Business and Socio-economic Development.

Dr Omar Arabiat is an Assistant Professor in the Accounting Department of the Business School at Hashemite University in Jordan. He holds a PhD in Accounting and Financial Management from the Business Informatics, Systems and Accounting department of Henley Business School, University of Reading.

Dr Maha Shehadeh is an Assistant Professor of FinTech at the Applied Science Private University in Jordan. She earned her PhD in Economics and Islamic Banking from Yarmouk University in 2021, focusing on digital transformation. Her research interests include FinTech, artificial intelligence and machine learning, digital transformation in banking and financial inclusion. Dr Shehadeh has been awarded first place in the Al Qasimia University Research Award for Islamic Economics for her research on the dimensions of digital transformation. She also serves as a Guest Editor and Reviewer for various academic journals. Maha Shehadeh is corresponding author and can be contacted at: ma_shehadeh@asu.edu.jo

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