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Elucidating Three Decades of Online Banking Adoption: The bibliometric analysis

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Abstract
This paper analyses the current state and publication trends in online banking adoption, identifying influential publications, major contributors and key research areas. Using a comprehensive literature review and bibliometric analysis, it evaluates publication trends, collaboration patterns and the evolution of online banking technologies from the 1990s to today. Findings show a progression from basic functionalities to advanced, AI-driven services, highlighting seminal works and key players in the field. The study, limited by its literature scope and database selection, provides valuable insights for enhancing online banking services and strategies, contributing to the field of understanding and future research directions.

Keywords: Online banking; adoption; Unified Theory of Acceptance and Use of Technology; bibliometric

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1.0 Introduction

Digital banking has evolved significantly over the past three decades from basic online access and fund transfers in the 1990s (Li et al., 2016) to sophisticated features such as AI-driven tools, mobile integration, and wearable technology in the 2020s (Lee & Kim, 2023). The 2000s introduced enhanced security, mobile banking, and investment features (Chen & Luo, 2015), while the 2010s saw the emergence of FinTech, Open Banking APIs, P2P payments, and robo-advisors (Yao et al., 2020). Despite rapid technological innovation, adoption and continued use among consumers remain inconsistent. Thus, to better understand this evolving research landscape, bibliometric analysis is essential, especially in FinTech, where interdisciplinary growth is accelerating. It enables the mapping of publication trends, identification of key contributors, and discovery of research gaps. Therefore, this study aims (1) to establish publication trends, (2) to identify influential works, authors, and institutions, and (3) to uncover key thematic areas in digital banking adoption. The structure of the paper includes an introduction, literature review, methodology, results, discussion and conclusion and recommendations.

2.0 Literature Review

This section provides a comprehensive overview of the evolution of online banking, examining the key technological advancements,

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regulatory considerations and their implications for consumer adoption.

2.1 Evolution of online banking

The evolution of financial technology from the mid-20th century to today has profoundly impacted online banking adoption. Starting with the introduction of computers and ATMs, the late 20th century saw the advent of online banking. The 21st century has brought rapid innovations, including AI, machine learning, mobile banking apps, contactless payments, and cryptocurrencies. Technologies such as mobile banking, online payment systems, blockchain, robo-advisors, and crowdfunding have made the financial sector more efficient and responsive (Kilic et al., 2022; Accenture, 2023; Demir & Riedel, 2022; AI for Good Global Summit, 2023; Mollick, 2023). The regulatory landscape has had to balance fostering innovation with ensuring stability and consumer protection (Xu & Huang, 2023). FinTech solutions have streamlined traditional processes, expedited transactions, and transformed consumer behaviour. However, despite extensive literature, findings are often fragmented, with limited synthesis on how these technologies influence adoption patterns across contexts. A systematic mapping is needed to consolidate key themes, identify gaps, and guide future research and practice. Understanding the drivers of online banking adoption, including demographic factors, technological literacy, security concerns, and perceived usefulness, remains essential for financial institutions to remain competitive (Lee & Wahid, 2018).

2.2 Previous study of online banking bibliometric analysis

Table 1 compares bibliometric analyses on mobile banking adoption by Preciado-Ortiz et al. (2018) and Mittal and Gupta (2021). Preciado-Ortiz used Scopus to analyse 94 documents focusing on trends and citations, while Mittal and Gupta analysed 180 documents from Web of Science, emphasizing top citations and thematic maps. Both studies provide insights using different methodologies and data sources.

Table 1. Summary of previous studies

Author	Domain/Search Strategy	Data Source & Scope	TDE	Bibliometric Attributes Examined
Preciado-Ortiz et al. (2018)	"Mobile banking adoption" and "m-banking adoption"	Scopus	94	-Publication trend -Authors cooperation -Most active journals -Geographical and institutional distribution and cooperation -Cited analysis -Citing and co-citation analysis -Top 20 most cited studies
Mittal & Gupta (2021)	"Mobile banking adoption"	Web of Sciences	180	-Key information -Source analysis -Bradford's law -Author analysis -Lotka's law -Countries analysis -Thematic map -Top 20 most cites documents

TDE=Total documents examined

(Source by: Authors)

3.0 Methodology

The search query was within the search title of ("adoption" AND ("online banking" OR "mobile banking" OR "internet banking" OR "electronic banking" OR "e-banking") from the Scopus database. Thus, it produced a total of 560 documents for further analysis. This study uses the data obtained from Scopus. Scopus is an acknowledged database for social science studies. Time frame, language, source types and document types are the scope for data collection in this study. This study opted for a title-only to ensure a higher level of relevance and precision in the dataset. Including abstracts and keywords could have significantly increased the volume of unrelated documents due to the broader context in which keywords are often used. By focusing on the title field, the study minimizes noise and ensures that the retrieved documents are centrally focused on the core concept of adoption in online banking, which is critical for accurate bibliometric mapping. In this bibliometric analysis, Microsoft Excel was used to store the database extraction from Scopus. Prior analysis, cleaning and harmonising the data were done using OpenRefine software. Then, biblioMagika by Ahmi (2023) was used to count the publication trends, document types, citation metrics and authors. Using VOSviewer software (Van Eck & Waltman, 2010) network visualisation and co-occurrence analysis of keywords were generated. Meanwhile, using Biblioshiny by Aria and Cuccurullo (2017) was used for mapping analysis of thematic maps and trend topics. Figure 1 below shows the summary of the steps in conducting this bibliometric analysis.

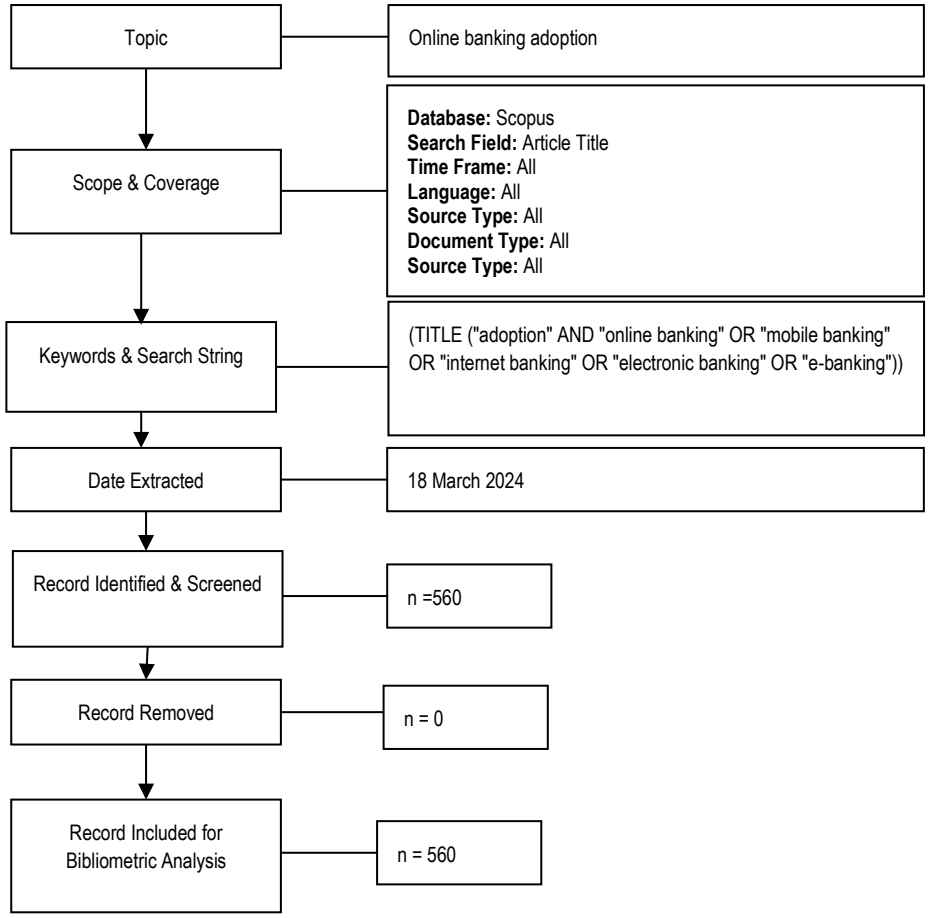

Fig. 1: Flow diagram of the search strategy.
(Source: Zakaria et al. (2021), Moher et al. (2009)

4.0 Results

4.1 Current state and trends of publication

4.1.1 Publication by year

Table 2 presents publication data spanning from 1994 to 2024, revealing a total of 560 publications and 1,494 cited publications. The cumulative citations amount to 26,322, resulting in an average of 47 citations per publication. Notably, the average citations per cited publication stand at an impressive 55.77, reflecting the robust impact and influence of the research output.

Table 2. Publication by Year

Year	TP	NCA	NCP	TC	C/P	C/CP	h-index	g-index
1994	1	2	1	11	11.00	11.00	1	1
1999	1	1	1	590	590.00	590.00	1	1
2000	1	2	1	136	136.00	136.00	1	1
2003	5	15	5	709	141.80	141.80	5	5
2004	7	18	7	1205	172.14	172.14	7	7
2005	9	22	9	549	61.00	61.00	5	9
2006	11	29	8	986	89.64	123.25	6	11
2007	12	30	9	701	58.42	77.89	7	12
2008	12	28	11	924	77.00	84.00	8	12
2009	25	64	25	2203	88.12	88.12	16	25
2010	26	68	25	2612	100.46	104.48	15	26

2011	25	68	22	1159	46.36	52.68	13	25
2012	28	68	26	2412	86.14	92.77	18	28
2013	19	43	16	246	12.95	15.38	9	15
2014	36	102	30	2413	67.03	80.43	13	36
2015	41	103	33	1698	41.41	51.45	16	41
2016	29	65	27	1486	51.24	55.04	13	29
2017	46	117	43	2208	48.00	51.35	18	46
2018	34	90	30	1711	50.32	57.03	18	34
2019	42	125	35	849	20.21	24.26	14	28
2020	40	119	38	811	20.28	21.34	13	28
2021	29	77	23	358	12.34	15.57	9	18
2022	39	121	27	254	6.51	9.41	8	15
2023	38	107	20	91	2.39	4.55	5	8
2024	4	10	0	0	0.00	0.00	0	0
Grand Total	**560**	**1494**	**472**	**26322**	**47.00**	**55.77**	**239**	**461**

Notes: TP=total number of publications; NCP=number of cited publications; TC=total citations; C/P=average citations per publication; C/CP=average citations per cited publication; h=h-index; and g=g-index.

(Source by: Authors)

Figure 2 shows that publications and citations on online banking adoption peaked in 2017 and then declined until 2023. This reduction is due to the stabilization of online banking, leading to fewer new insights and a shift towards emerging trends like fintech innovations, which diverted attention from traditional online banking studies.

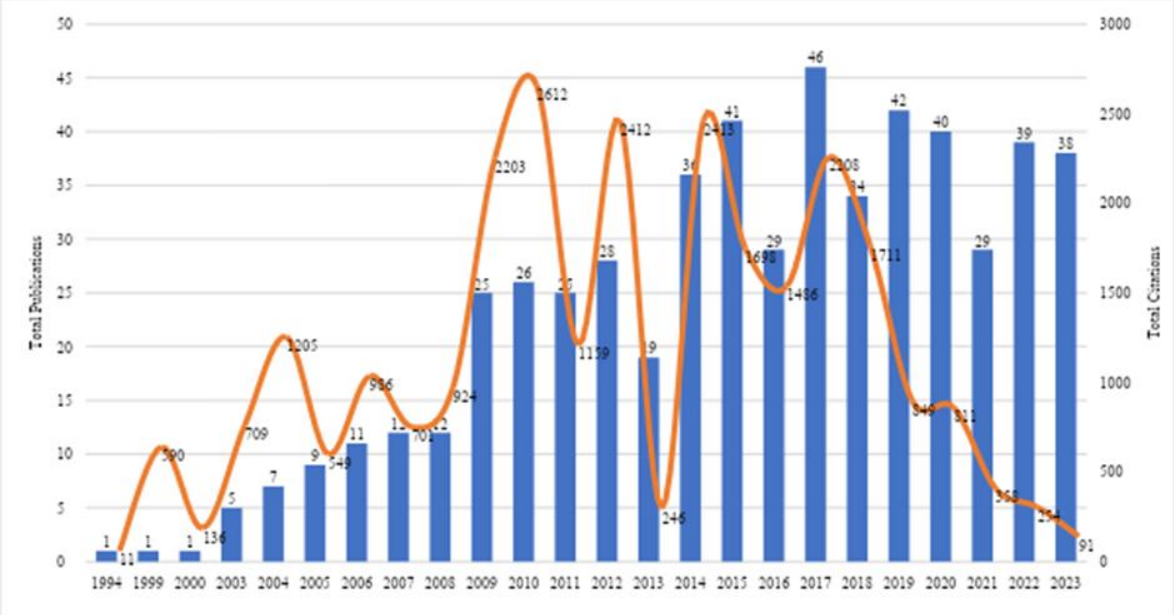

Fig. 2: Total Publications and Citations by Year
(Source by: Authors)

4.2 The most influential documents

4.2.1 Highly cited documents

The top 10 highly cited research articles on online banking adoption investigate various factors influencing internet and mobile banking services. Key studies include Lee (2009) integrating TAM and TPB with perceived risk and benefit, Zhou et al. (2010) combining TTF and UTAUT for mobile banking, Martins et al. (2014) developing a unified theory considering perceived risk and Alalwan et al. (2017) extending UTAUT2 with trust among Jordanian customers. Other notable studies by Sathye (1999), Oliveira et al. (2014) and Cheng et al. (2006) examine adoption in Australia, Hong Kong, Iran and explores gender effects (Riquelme & Rios, 2010). Overall, these studies, with citations ranging from 427 to 1223, highlight significant contributions and trends in online banking adoption.

Table 3. Top 10 highly cited documents

No.	Author(s)	Title	Source Title	TC	C/Y
1	Lee (2009)	Factors influencing the adoption of internet banking: An integration of TAM and TPB with perceived risk and perceived benefit	Electronic Commerce Research and Applications	1223	76.44
2	Zhou et al. (2010)	Integrating TTF and UTAUT to explain mobile banking user adoption	Computers in Human Behavior	1079	71.93
3	Martins et al. (2014)	Understanding the internet banking adoption: A unified theory of acceptance and use of technology and perceived risk application	International Journal of Information Management	880	80.00
4	Alalwan et al. (2017)	Factors influencing adoption of mobile banking by Jordanian bank customers: Extending UTAUT2 with trust	International Journal of Information Management	853	106.63
5	Lin H.F. (2011)	An empirical investigation of mobile banking adoption: The effect of innovation attributes and knowledge-based trust	International Journal of Information Management	609	43.50
6	Sathye (1999)	Adoption of Internet banking by Australian consumers: an empirical investigation	International Journal of Bank Marketing	590	22.69
7	Oliveira et al. (2014)	Extending the understanding of mobile banking adoption: When UTAUT meets TTF and ITM	International Journal of Information Management	555	50.45
8	Shaikh & Karjaluoto (2015)	Mobile banking adoption: A literature review	Telematics and Informatics	554	55.40
9	Cheng et a. (2006)	Adoption of internet banking: An empirical study in Hong Kong	Decision Support Systems	524	27.58
10	Riquelme & Rios (2010)	The moderating effect of gender in the adoption of mobile banking	International Journal of Bank Marketing	427	28.47

(Source by: Authors)

4.3 Key players and collaboration pattern

4.3.1 Publication by Institutions

Table 4 highlights the most productive institutions in online banking adoption research, each with at least five publications. Five local institutions have between five and ten publications, while five international institutions contribute with five to six publications each. This distribution reflects significant collaborative efforts between local and international institutions in advancing the field.

Table 4. Most productive institutions with minimum of five publications

Institutions	TP	TC	NCP	C/P	C/CP	h-index	g-index
Universiti Teknologi Malaysia	10	85	6	8.50	14.17	4	9
International Islamic University Malaysia	6	60	4	10.00	15.00	3	6
Multimedia University	6	294	6	49.00	49.00	4	6
Universiti Utara Malaysia	6	160	5	26.67	32.00	4	6
Swansea University	6	1821	6	303.50	303.50	6	6
International Management Institute New Delhi	6	176	6	29.33	29.33	4	6
Universiti Malaya	5	163	5	32.60	32.60	4	5
Indian Institute of Management Kozhikode	5	31	2	6.20	15.50	2	5
University of Jyväskylä	5	1057	5	211.40	211.40	5	5
Iqra University	5	257	5	51.40	51.40	5	5

Notes: TP=total number of publications; NCP=number of cited publications; TC=total citations; C/P=average citations per publication; C/CP=average citations per cited publication; h=h-index; and g=g-index.

(Source by: Authors)

4.4 Research Area

4.4.1 Thematic Map

Figure 3 is the thematic map categorizes key themes in online banking adoption research into four quadrants based on development and relevance. Niche Themes (high development, low relevance) include topics like the Unified Theory of Acceptance and Use of Technology and social influence, important to specific technology acceptance studies. Motor Themes (high development, high relevance) cover mobile banking, perceived risk, and technology adoption, reflecting their central role in the financial sector. Emerging or Declining Themes

(low development, low relevance) involve banking, consumer behaviour, and electronic commerce, representing either new trends or fading areas. Basic Themes (low development, high relevance), such as internet banking, the Technology Acceptance Model, and structural equation modelling, form the foundation for further research despite limited recent focus.

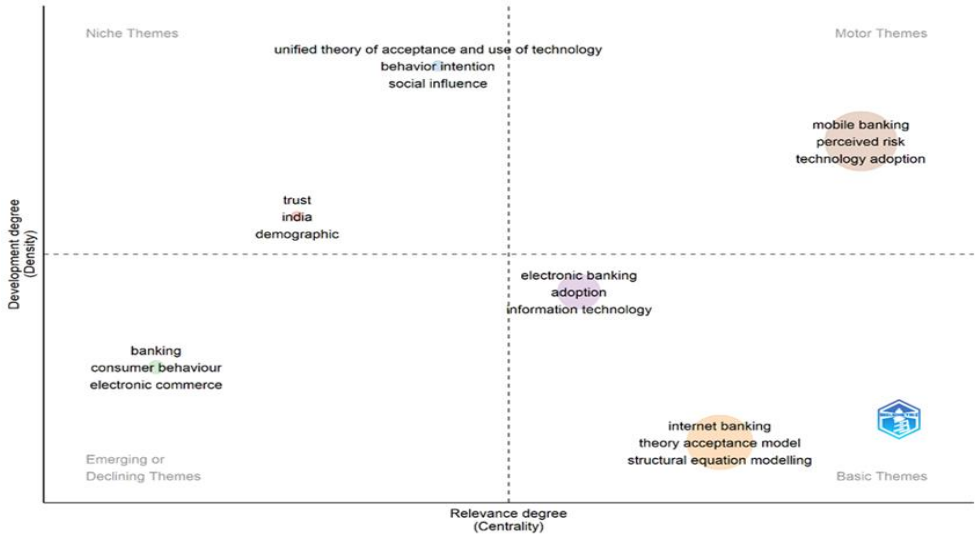

Fig. 3: Thematic Map
(Source by: Authors)

5.0 Discussion

The bibliometric analysis of online banking adoption reveals growing academic interest in consumer behaviour and adoption patterns, especially in regions such as India, Malaysia, and the UK. The multidisciplinary nature of the research spanning business, management, and computer science reflects the increasing global dependence on digital banking services. The surge in publications from emerging economies, particularly India and Malaysia, underscores the rapid adoption and expansion of digital financial infrastructure in these regions. Financial institutions are urged to enhance digital service offerings and customise strategies that align with regional user behaviour and preferences. For policymakers, the findings highlight the importance of implementing supportive regulatory frameworks that promote digital inclusion, data security, and public trust, particularly among underbanked populations. Initiatives focused on improving digital literacy and equitable access to technology are essential to close adoption gaps. Educators can integrate insights from digital banking trends and adoption models into academic curricula to prepare future professionals for the evolving FinTech landscape. Theoretically, this study strengthens the relevance of established models like the Technology Acceptance Model (TAM) and the Unified Theory of Acceptance and Use of Technology (UTAUT) in explaining adoption behaviour across diverse cultural and economic contexts. However, it also points to the need for these models to evolve by incorporating socio-cultural, institutional, and infrastructural variables that influence technology adoption. Future research should address demographic diversity, temporal trends, and cultural variations while also acknowledging the inherent limitations of relying solely on indexed and quantitative literature sources.

6.0 Conclusion & Recommendations

This study provides a comprehensive overview of online banking adoption trends, from basic features in the 1990s to today's AI-driven services. It emphasizes the role of security, user experience, and technological innovation, alongside key contributions from authors and institutions. An empirical study on digital banking readoption in Malaysia using the UTAUT 3 model reveals that factors like performance expectancy, social influence, and trust significantly influence customer behaviour. The study highlights the need for technological innovation and user-centric strategies, acknowledging limitations such as the limited scope of literature reviewed and the pace of technological change. Future studies should consider broader datasets and cross-country comparisons to enhance generalizability. It is also recommended that financial institutions prioritize digital trust, user experience, and adaptive technologies to foster wider adoption and sustained use of digital banking services.

Paper Contribution to Related Field of Study

The analysis tracks the evolution of online banking from basic functions to AI-driven services, identifying key research contributions and collaborations. These insights are essential for improving online banking services and strategic approaches.

References

Accenture. (2023). Banking in the cloud: Evolution of financial services. Accenture.

Ahmi, A. (2023). biblioMagika. https://www.aidi-ahmi.com/index.php/bibliomagika.

AI for Good Global Summit. (2023). Exploring AI's impact on the financial sector. ITU

Alalwan, A. A., Dwivedi, Y. K., & Rana, N. P. (2017). Factors influencing adoption of mobile banking by Jordanian bank customers: Extending UTAUT2 with trust. *International Journal of Information Management*, 37(3), 99–110.

Aria, M., & Cuccurullo, C. (2017). bibliometrix: An R-tool for comprehensive science mapping analysis. *Journal of Informetrics*, 11(4), 959–975. https://doi.org/https://doi.org/10.1016/j.joi.2017.08.007.

Cheng, T. C. E., Lam, D. Y. C., & Yeung, A. C. L. (2006). Adoption of internet banking: An empirical study in Hong Kong. Decision Support Systems, 42(3), 1558–1572.

Chen, S., & Luo, Y. (2015). The role of user trust in mobile banking adoption. Decision Support Systems, 78, 28-37.

Demir, A., & Riedel, R. (2022). Blockchain in the financial sector: The potential and challenges. *Journal of Banking and Financial Technology*, 6(3), 251–267.

Kilic, B., Kuzey, C., & Uyar, A. (2022). The impact of financial technologies (FinTech) on financial inclusion: Evidence from emerging markets. *Journal of Banking and Finance*, 132, 106330.

Lee, M. C. (2009). Factors influencing the adoption of internet banking: An integration of TAM and TPB with perceived risk and perceived benefit. Electronic Commerce Research and Applications, 8(3), 130–141.

Lee, J. Y., & Kim, Y. J. (2023). The effects of digital banking service quality and perceived security on customer satisfaction and trust. Technological Forecasting and Social Change, 190, 120423.

Lee, J., & Wahid, F. (2018). Factors influencing the adoption of online banking: An integration of technological, social, and personal factors. *International Journal of Information Management*, 38(1), 312-324.

Li, Y., Bao, J., & Rui, H. (2016). The impact of internet banking on the financial performance of commercial banks in China. *International Journal of Financial Research*, 7(2), 183-190.

Martins, C., Oliveira, T., & Popovič, A. (2014). Understanding the internet banking adoption: A unified theory of acceptance and use of technology and perceived risk application. *International Journal of Information Management*, 34(1), 1–13.

Mittal, S., & Gupta, S. (2021). Mobile banking adoption: A bibliometric review of key factors, models, and research trends. *Journal of Financial Services Marketing*, 26(3), 232-245.

Mollick, E. (2023). Crowdfunding: A tool for financial democratization and innovation. Harvard Business Review.

Oliveira, T., Faria, M., Thomas, M., & Popovič, A. (2014). Extending the understanding of mobile banking adoption: When UTAUT meets TTF and ITM. International *Journal of Information Management*, 34(5), 689–703.

Preciado-Ortiz, M., García-Alcober, C., Sánchez-Fernández, J., & Barquero-Pérez, Ó. (2018). A bibliometric analysis of mobile banking adoption: Key themes and emerging trends. *Journal of Financial Services Marketing*, 23(2), 111-123.

Riquelme, H. E., & Rios, R. E. (2010). The moderating effect of gender in the adoption of mobile banking. *International Journal of Bank Marketing*, 28(5), 328–341.

Sathye, M. (1999). Adoption of internet banking by Australian consumers: An empirical investigation. *International Journal of Bank Marketing*, 17(7), 324–334.

Van Eck, N. J., & Waltman, L. (2010). VOSViewer: Visualising scientific landscapes [Software]. Version 1, 15.

Yao, X., Li, J., & Wang, Z. (2020). The impact of open banking APIs on financial service innovation: A literature review. *International Journal of Information Management*, 54, 102142.

Zakaria, R., Ahmi, A., Ahmad, A. H., Othman, Z., Azman, K. F., Ab Aziz, C. B., Ismail, C. A. N., & Shafin, N. (2021). Visualising and mapping a decade of literature on honey research: A bibliometric analysis from 2011 to 2020. *In Journal of Apicultural Research* (Vol. 60, Issue 3, pp. 359–368). Taylor and Francis Ltd. https://doi.org/10.1080/00218839.2021.1898789.

Zhou, T., Lu, Y., & Wang, B. (2010). Integrating TTF and UTAUT to explain mobile banking user adoption. Computers in Human Behavior, 26(4), 760–767.