ELECTRONIC MARKETING FOR FINANCIAL SERVICES: A CASE STUDY ON ISLAMIC BANKS IN THE UNITED ARAB EMIRATES

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ABSTRACT

E-marketing widely facilitated the banking sector as it enabled financial institutions to enhance their services and access global arenas. To further validate this, the current study intends to identify the extent to which Islamic banks in the UAE employ e-marketing and its role in enhancing the relationship with customers and its influence on the quality of banking services. The researchers also seek to provide pertinent information to help bank departments to adapt and integrate e-marketing in Islamic services. For data gathering purposes, n= 12 questionnaires were distributed among the services sector employees in Dubai Islamic Bank and Sharjah Islamic Bank. Results revealed that there is a significant relationship between the adaptation of e-marketing and the improved quality of banking services. Additionally, the results also indicated statistically significant differences in the responses regarding the banking services due to the varying demographic factors of the potential clients. Thus, the researchers recommend that the awareness and adoption of e-marketing through employee training can be of greater pre-eminence. Especially in Islamic banking, relying on contemporary marketing technology can play a sturdy role to improve their services and sustain better relations with the customers.

KEYWORDS: Electronic Marketing, Financial Services, ICT, Islamic banks, UAE.

INTRODUCTION:

E-marketing is one of the primary concepts regarding technology usage as a result of accepting, adopting, and integrating digital trends in almost every field of life (Anand et al., 2013; Habes, Alghizzawi, Ali, et al., 2020; Habes, Alghizzawi, Salloum, et al., 2020; Muhaisen et al., 2020). Especially technology usage for marketing purposes such as communication, product representation, and completing of other marketing operations is o greater significance. Mainly, the banking sector widely adopted technology used to improve their operations and also to provide better services to their customers (Choi et al., 2016). Technology adoption also introduced various transformational changes in banking services, i.e., internet banking to provides new services accompanied by better experiences and customer loyalty (Alhawamdeh, Alghizzawi, et al., 2020; Phelps et al., 2004) Banks might differ in their modes and types of services, but all facilitate buying, selling, and communication are mainly known as "e-commerce."[4][5]. Today banks cannot operate without adopting, and integration e-marketing as traditional methods were finite having several operational and communicational limitations. Due to this reason, considering e-marketing as a topic of research provides further insights into the phenomenon. Most importantly, analyzing the impacts of technology usage on e-marketing is a prominent field of study. As the global economic environment witnessed drastic changes as a part of the globalization policy, new technologies also benefited all economic sectors, including banking institutions (Alhawamdeh, Alghizzaw, et al., 2020; Reddy & Kumar, 2018). So we assume that technology usage also motivates investors to invest in banking to avail more profit and other fruitful outcomes. In this context, internet banking provided several opportunities and improved service at the doorstep with rapid access, ease of use, and affordable rates. Therefore, the twenty-first century is distinguished by new trends driving the economy, and digital resources are the main financial engine. This is how technology improved the economy and handling financial matters (Abdulla et al., 2011; Alghizzawi, Habes, Salloum, et al., 2019).

LITERATURE REVIEW

The banking sector recently witnessed significant developments, and one of these developments is the use of an e-payment system which allows to sale or purchase by using digital means. Banks introduced modern payment methods known as electronic or digital money, as a medium of online payment. As a result, new

trends of communication, business, and interaction mostly facilitated commercial deals. From this perspective, technology caused a paradigm shift in the business arenas leading to several economic impacts on the financial sector. It is essential to upgrade banking service as traditional service cannot help to keep pace with the modern marketing trends. International markets follow these trends and gain massive economic benefactions (Abu-Naser et al., 2017; Al-Shibly et al., 2019; Salloum, Al-Emran, Habes, et al., 2019) In the current study, the researcher will highlight the importance and advantages of e-marketing. And potential obstacles hindering e-banking (Hu et al., 2019).

E-marketing mainly relies on the Internet for practicing everyday tasks, such as advertising, selling, distribution, marketing research, designing new products, pricing, and others.(Tarighi et al., 2017) Several studies witnessed that electronic marketing focuses on different communication networks to achieve customer satisfaction. These sources offer better services to improve productivity, re-engineering of marketing, marketing effectiveness, etc. To conduct marketing operations, i.e., sale, purchase, or exchange, e-marketing also provides affordable buying options as compared to other goods sold by using catalogs sent by mail or through traditional stores. Online retail trade reduced fixed costs by more than 50% by displaying the products on the Internet (Anderson & Geller, 1998). Prices are comparatively low because electronic marketing does not need a physical store bearing expenses such as rent, electricity, and labor wages. E-marketing also helps consumers to shop 24 hours a day, as unlike traditional marketing, it provides a wide range and variety of products and brands (Lee, 2002). Moreover, e-marketing also allows consumers to make better and faster price comparisons buying as consumers do not spend much effort and time as they generally do during traditional shopping. Similarly, t also saves time as people, i.e., working women, cannot wander in conventional markets. Due to e-marketing, they conveniently purchase products and receive them on their doorstep. Also, online shopping helps to overcome geographical barriers as consumers know what is available in the international markets and they can buy them with just a single click (Alnawafleh et al., 2019; Kapoulas et al., 2002).

2.1 Islamic Banking:

An Islamic bank is a financial, monetary institution that works to attract cash resources from community members and employ them effectively to ensure their maximization and growth. These banks follow the framework of the stable rules of Islamic law that serve the public interest and works to improve their financial stability (Hassan et al., 2008). From this definition, it becomes clear that there are several fundamental elements that Islamic banks adhere to, including stable rules of Islamic law. The Islamic bank must comply with the provisions of Islamic Sharia in all its business and dealings; otherwise, it can lose its objective. Economic activities such as production, distribution, consumption, savings, and others abide by Islamic laws as Islamic banking is derived from the ideologies of Quranic verses, Hadiths of Holy Prophet Mohammed (PBUH 🍇) and the jurisprudence of the distinguished scholars (Hoq et al., 2010). Electronic banking from Islamic financial institutions also obligates the designated laws regarding withdrawal, payment, credit, transfer, dealing in securities, or other banking business. Electronic banks are financial institutions that provide services to their customers while striving to improve their services using the latest trends. From here, the concept of electronic banking emerged, based on delivering banking services using electronic means and developing new services (Alghizzawi, Habes, & Salloum, 2019; Majumder, 2018). By using these means, the bank provides services without using human labor and traditional limitations based on automated accounts. E-banking provides an opportunity to gain compatibility in the market. The assumption that the electronic bank is merely managing banking operations and financial accounts is wrong. As technology allows the customers to manage their banking matters on their own, e-banking offers a range of comprehensive services that meet the requirements of customers (Abu-Rabia-Queder, S, 2013). The trend of electronic cash payments associated with trade and electronic business sites justify the establishment of electronic banks, insurance companies, airlines, and hotels (Cook & Coupey, 1998; Habes et al., 2019).

2.2 Electronic Marketing in Islamic Banks:

Electronic banking in Islamic banks ensures practicing modern marketing trends that gained much focus from researchers and stakeholders. E-banking is characterized by the cognitive intersection between different groups of scientific knowledge, such as marketing, cognitive sciences, finance, and behavioral sciences (Lee, 2002; Salloum, Al-Emran, Khalaf, et al., 2019). Electronic marketing plays in Islamic banks support the

survival and continuation of the bank's proceedings (Abu-Naser et al., 2017). Due to this reason, e-banking focuses on individual choices and needs, providing better banking experience to every customer. Other considerations, such as the quality of service, the manner of dealing with the public, and after-sales services, are also an essential criterion for the customers' choosing the relevant banks (Athashree Vartak Rathi, 2019). The banking industry witnessed tangible progress in allowing customers of Islamic banks to conduct banking operations through electronic communication networks. We also expect that these operations will widely increase in the coming years due to the growing technology used for operations in Islamic banks (Vassalos & Lim, 2016).

With electronic banking operations, banks provide traditional or innovative banking services through electronic communication networks. Given that banking services in Islamic banks contain higher customers' demands, the banking sector needed to adopt technology to facilitate their overall services. Technology adoption also became cruciate increase performance compatibility in the fast-changing marketing arenas (Alghizzawi, Salloum, et al., 2018; Salloum, Al-Emran, Habes, et al., 2019).

2.3 Strategy of Electronic Banking-Marketing:

The strategy of electronic banking marketing in Islamic banks is to provide electronic banking services through the Internet. As a new marketing channel, the Internet has unique characteristics that distinguish it from other communication channels (Al-Mahayreh & Abdel-Qader, 2015; Alghizzawi, Ghani, et al., 2018). The e-marketing strategy in Islamic banks transformed from the Spatial Market Place to Market Space, Space Shopping, and Electronic Catalog. As the Internet facilitates accessing the digital service, e-marketing also united the world by enabling us with digital banking services.

2.4 Advantages of Electronic Banking-Marketing in Islamic Banks:

The digital age and the digital revolution also developed the communication patterns that affected the way we receive and send information. To advertise the products, resorting to digital resources is essential components of the operations of electronic banking marketing that contain the following features(Al-Swidi et al., 2012; Cook & Coupey, 1998; Habes, Alghizzawi, Khalaf, et al., 2018).

- ✓ **Reduced costs:** Switching to e-banking led to reduced cost with better services and accessibility. Due to technology adaptation, Islamic banks upgraded their services, decreased human labor, and provided better quality services with improved sales and purchase experiences.
- ✓ The quality and speed of customer service: Islamic banking provided fast and accessible customer services via the Internet. This digital patterns of customer support improved customer-bank relationships and provided better offers and services to the customers.
- ✓ Client Assistance: Facilitated clients to make better choices and decisions with appropriate guidance and guidance services.
- ✓ **Increased productivity:** Answering clients' technical questions regarding services, increased the productivity of electronic banks with the lowest costs and the least possible effort.
- ✓ **Information exchange, suitability, and control over it:** Electronic banking marketing facilitates the process of information exchange. As customers can access the bank's website and access their accounts, or recorded materials or the possibility of registration without committing to the physical location of the commercial bank.
- ✓ **Use of Online Services:** Through Internet, Islamic banking institutions can offer their banking services to their clients in the local and target foreign markets according to the demands and standards of international labor markets.

RESEARCH METHODOLOGY

Research Methodology is the central pillar of each study, as it is the path leading to uncovering the problem of the research and achieving its objectives. Besides, setting the general rule, of course, the methodology also

includes the research plan, data collection tools, and previous studies that also used present methods. (Khadija Alhumaid et al., 2020; Habes, Salloum, et al., 2018) Thus the procedure involves manipulating and the data and obtain generalizable results in an organized manner (K. F. Alhumaid, 2014; K Alhumaid, 2020; Khadija Alhumaid, 2019; Habes, Salloum, et al., 2018; Salloum, Al-Emran, Khalaf, et al., 2019) Based on the nature of the study topic, the researcher used the case study method and obtained quantitative data to avail valid and reliable conclusions (Habes, 2019; Habes, Alghizzawi, Salloum, et al., 2018) The researchers also provided information to help bank departments to adapt and integrate e-marketing in Islamic services. For data gathering purposes, the researcher used n=12 structured questionnaires, distributed among the services sector employees in Dubai Islamic Bank and Sharjah Islamic Bank.

DATA ANALYSIS AND RESULTS

4.1 Respondents' Demographical Data:

Table 1 below indicates the demographic data of study respondents. As showed, the percentage of females was 58.3%, and the percentage of males was 41.7%. Also, 58.3% of the respondents' ages were between 22 and 29 years old, and the percentage of those holding a master's degree and a bachelor's degree was 33.3%. Moreover, most of the respondents had experience in teaching English from one to two years, and 41.7% of expatriates made up 75%, and 35% of participants were Emiratis.

Table 1: Demographic variables

Variable	Category	Frequency	Percentage		
	361		41.70/		
C 1	Male	5	41.7%		
Gender	Female	7	58.3%		
	22 - 33	7	58.3%		
Age	33 - 43	2	16.7%		
	More 43	3	25%		
	Diploma	1	8.3%		
Education Degree	Diploma / Advanced	1	8.3%		
Education Degree	Bachelor	4	33.3%		
	Master	4	33.3%		
	PhD	2	16.7%		
	1-2	5	41.7%		
Experience	2-5	2	16.7%		
	More five years	5	41.7%		
Nationality	Foreigner	11	91,7%		
	UAE	1	8.3%		

4.2. Descriptive Statistics:

This section constitutes the survey results. The researcher used a descriptive method to count and represent the respondents. **Table 2** below illustrates a brief picture of responses.

Table 2: The Impact of Electronic Marketing on Islamic banks

S/R	Questions	Strongly	Disagree	Undecided	Agree	Strongly
		Disagree	(D)	(U)	(A)	Agree
		(SD)				(S A)
1	Most Islamic banks have a culture of their own concerning				83.3%	16.7%
	banking services, which is that of the customer.					
2	The technology used contributes to the Islamic banking				90.9%	9.1%
	business, which is reflected in the banking services provided.					
3	Not to diversify banking services and limit them to a small			8.3%	41.7%	50%
	group of services.					
4	Lack of attention to banking service quality standards			8.3%	58.3%	33.3%
	represented by the marketing quality of Islamic services					
5	Increasing the level of human resources training in the bank,				50%	50%
	especially about the use of technology and the use of modern					

	marketing methods, which will be reflected in their performance at work.					
6	Increasing the quality of Islamic banking services	8.3%		16.7%	50%	25%
7	Providing a database that helps UAE Islamic banks to achieve competitive advantages that help them make their marketing decisions in particular and administrative in general.			8.3%	50%	41.7%
8	Customers for technology-based banking services that they found in Islamic banking and switched to them			8.3%	75%	16.7%
9	Increase the reputation of the Islamic bank and the quality of services,		8.3%		58.3%	33.3%

Table 2 shows the impact of electronic marketing in Islamic banks on improving the quality of banking services in the United Arab Emirates, in Dubai Islamic Bank and Sharjah Islamic Bank. Through questions **3** and **5** that postulated "Not to diversify banking services and limit them to a small group of services," the problem "Increasing the level of human resources training in the bank, especially concerning the use of technology and the use of modern marketing methods, which will be reflected in their performance at work" and the question **7** that mentioned, "Providing a database that helps UAE Islamic banks to achieve competitive advantages that help them make their marketing decisions in particular and administrative in general" ranked last in terms of strongly agreeing. The results showed a high reputation of Islamic banks and their services, as most of the study sample expressed strong agreement.

In the next question, searching for the most preferred factors which make the customers switch from the traditional method to the digital techniques (41.7%) and (33.3%) strongly agreed on e-banking as increasing the quality of Islamic banking services. Furthermore, 25% of respondents also agreed that Islamic banks have their own culture regarding banking services". Similarly, 16% of respondents strongly agreed that customers for technology-based banking services that they found in Islamic banking and switched to them

5.2 Hypothesis testing:

Table 3: One-Sample t-test for the relationship between electronic marketing and the quality of banking services in Islamic banks

Scaling factors	t	df	Sig	Average differences	above	least
electronic marketing & quality	58.352	99	0.000	4.15857	4.0172	4.3000
of banking services						

The previous table informs us clearly and unquestionably that the use of e-marketing has an influential and statistically significant role at the significance level (0.000) in developing the quality of banking services in the UAE Islamic banks as a result of the development of e-marketing and digital marketing in the Arab region and the Arab world.

CONCLUSION AND FUTURE RESEARCH

Results explicitly revealed that a majority of the individuals agreed on the importance of electronic marketing for Islamic banking services. The obstacles related to e-banking usage were moderate due to deal with clarity of instructions, training on the use, and technology awareness (Hu et al., 2019). Findings also indicated that electronic marketing increases the effectiveness of work and increase services' quality and accessibility. Results also showed that electronic marketing increases the effectiveness of work and increase services' quality and accessibility. We also found that due to advanced technology usage, banking services improved, leading to attracting more customers. The hypothesis also showed a strong significant relationship between emarketing in Islamic banks and improved quality of banking services in the United Arab Emirates.

Thus, the researcher hopes that Islamic banks will hold courses and workshops that include a modern administrative trend to improve customers' banking experiences. As Islamic banking needs to pay attention to building an infrastructure for information and communication technology in Islamic banks, it also guarantees a rapid success and more opportunism even for the bank employees as well.

REFERENCE

- 1) Abdulla, J., Djebarni, R., & Mellahi, K. (2011). Determinants of job satisfaction in the UAE. Personnel Review
- 2) Abu-Naser, S. S., El Talla, S. A., Abu Amuna, Y. M., & Al Shobaki, M. J. (2017). Social Networks and Their Role in Achieving the Effectiveness of Electronic Marketing of Technical Colleges.
- 3) Abu-Rabia-Queder. S. (2013). "Bedouin Society as a Challenge to Israel", in: R. Pedahzur (Ed). The Bedouin in Israel's Negev Regional Strategic challenges: Netanya, published by the Centre. Daniel Abraham Center for Strategic Dialogue, College Conditioning, 18–27.
- 4) Al-Mahayreh, M., & Abdel-Qader, M. A. (2015). The effect of the factors leading to job satisfaction on the innovation level: study on workers in Islamic banks operating in Jordan. International Journal of Business, Humanities and Technology, 5(1), 24–39.
- 5) Al-Shibly, M. S., Alghizzawi, M., Habes, M., & Salloum, S. A. (2019). The Impact of De-marketing in Reducing Jordanian Youth Consumption of Energy Drinks. International Conference on Advanced Intelligent Systems and Informatics, 427–437.
- 6) Al-Swidi, A. K., Nawawi, M. K. M., & Al-Hosam, A. (2012). Is the relationship between employees' psychological empowerment and employees' job satisfaction contingent on the transformational leadership? A study on the Yemeni Islamic banks. Asian Social Science, 8(10), 130.
- 7) Alghizzawi, M., Ghani, M. A., Som, A. P. M., Ahmad, M. F., Amin, A., Bakar, N. A., Salloum, S. A., & Habes, M. (2018). The Impact of Smartphone Adoption on Marketing Therapeutic Tourist Sites in Jordan. International Journal of Engineering & Technology, 7(4.34), 91–96.
- 8) Alghizzawi, M., Habes, M., & Salloum, S. A. (2019). The Relationship Between Digital Media and Marketing Medical Tourism Destinations in Jordan: Facebook Perspective. International Conference on Advanced Intelligent Systems and Informatics, 438–448.
- 9) Alghizzawi, M., Habes, M., Salloum, S. A., Ghani, M. A., Mhamdi, C., & Shaalan, K. (2019). The effect of social media usage on students'e-learning acceptance in higher education: A case study from the United Arab Emirates. International Journal of Information Technology and Language Studies, 3(3).
- 10) Alghizzawi, M., Salloum, S. A., & Habes, M. (2018). The role of social media in tourism marketing in Jordan. International Journal of Information Technology and Language Studies, 2(3).
- 11) Alhawamdeh, A. K., Alghizzaw, M., Habes, M., & Alshibly, M. S. (2020). The Relationship Between Media Marketing Advertising and Encouraging Jordanian Women to Conduct Early Detection of Breast Cancer.
- 12) Alhumaid, K. F. (2014). Perspectives and Usage of Technology of Arabic Language Teachers in the United Arab Emirates. University of Kansas.
- 13) Alhumaid, K. (2020). The use of mobile technology for teaching and learning. International Journal of Education, 5(1), 1–18.
- 14) Alhumaid, Khadija. (2019). Feminist Perspectives on Education and Pedagogy: A Meta-Synthetic Insight into the Thought of Four American Philosophers. Academic Journal of Interdisciplinary Studies, 8(3), 31.
- 15) Alhumaid, Khadija, Ali, S., Waheed, A., Zahid, E., & Habes, M. (2020). COVID-19 & Elearning: Perceptions & Attitudes Of Teachers Towards E- Learning Acceptancein The Developing Countries. 6(2), 100–115. https://doi.org/10.5281/zenodo.4060121
- 16) Alnawafleh, H., Alghizzawi, M., & Habes, M. (2019). The impact of introducing international brands on the development of Jordanian tourism. International Journal of Information Technology and Language Studies, 3(2).
- 17) Anand, S., Gupta, M., & Kwatra, S. (2013). Social Media and Effective Health Communication. International Journal of Social Science, 2(8), 39–46.
- 18) Anderson, W. P., & Geller, J. B. (1998). System for on-line financial services using distributed objects. Google Patents.
- 19) Athashree Vartak Rathi, A. (2019). Impact of Technology on Human life. Department of Computer Engineering, 08, 23.
- 20) Choi, S. L., Goh, C. F., Adam, M. B. H., & Tan, O. K. (2016). Transformational leadership, empowerment, and job satisfaction: the mediating role of employee empowerment. Human Resources for Health, 14(1), 73.

- 21) Cook, D. L., & Coupey, E. (1998). Consumer behavior and unresolved regulatory issues in electronic marketing. Journal of Business Research, 41(3), 231–238.
- 22) Habes, M. (2019). The influence of personal motivation on using social TV: A Uses and Gratifications Approach. International Journal of Information Technology and Language Studies, 3(1).
- 23) Habes, M., Alghizzawi, M., Ali, S., SalihAlnaser, A., & Salloum, S. A. (2020). The Relation among Marketing ads, via Digital Media and mitigate (COVID-19) pandemic in Jordan. International Journal of Advanced Scienc, 29(7), 2326–12348.
- 24) Habes, M., Alghizzawi, M., Khalaf, R., Salloum, S. A., & Ghani, M. A. (2018). The Relationship between Social Media and Academic Performance: Facebook Perspective. International Journal of Information Technology and Language Studies, 2(1).
- 25) Habes, M., Alghizzawi, M., Salloum, S. A., & Ahmad, M. F. (2018). The Use of Mobile Technology in the Marketing of Therapeutic Tourist Sites: A Critical Analysis. International Journal of Information Technology and Language Studies, 2(2).
- 26) Habes, M., Alghizzawi, M., Salloum, S. A., & Mhamdi, C. (2020). Effects of Facebook Personal News Sharing on Building Social Capital in Jordanian Universities. In Recent Advances in Intelligent Systems and Smart Applications (pp. 653–670). Springer.
- 27) Habes, M., Salloum, S. A., Alghizzawi, M., & Alshibly, M. S. (2018). The role of modern media technology in improving collaborative learning of students in Jordanian universities. International Journal of Information Technology and Language Studies, 2(3).
- 28) Habes, M., Salloum, S. A., Alghizzawi, M., & Mhamdi, C. (2019). The Relation Between Social Media and Students' Academic Performance in Jordan: YouTube Perspective. International Conference on Advanced Intelligent Systems and Informatics, 382–392.
- 29) Hassan, A., Chachi, A., & Abdul Latiff, S. (2008). Islamic marketing ethics and its impact on customer satisfaction in the Islamic banking industry. Journal of King Abdulaziz University: Islamic Economics, 21(1).
- 30) Hoq, M. Z., Sultana, N., & Amin, M. (2010). The effect of trust, customer satisfaction and image on customers' loyalty in islamic banking sector. South Asian Journal of Management, 17(1), 70.
- 31) Hu, X., Liu, S., Zhang, Y., Zhao, G., & Jiang, C. (2019). Identifying top persuaders in mixed trust networks for electronic marketing based on word-of-mouth. Knowledge-Based Systems, 182, 104803.
- 32) Kapoulas, A., Murphy, W., & Ellis, N. (2002). Say hello, wave goodbye: missed opportunities for electronic relationship marketing within the financial services sector? The International Journal of Bank Marketing, 20(7), 302–310.
- 33) Lee, J. (2002). A key to marketing financial services: the right mix of products, services, channels and customers. Journal of Services Marketing.
- 34) Majumder, J. (2018). Measuring Impact of Word-of-Mouth on Travel: A Study Based on Bangladeshi Tourists 'Experience at Cox's Bazar. XXXVIX(1).
- 35) Muhaisen, O. Al, Habes, M., & Alghizzawi, M. (2020). An Empirical Investigation the Use of Information , Communication Technologies to English Language Acquisition: A Case Study from the Jordan,. International Journal of Innovations in Engineering and Science, 7(5), 261–269.
- 36) Phelps, J. E., Lewis, R., Mobilio, L., Perry, D., & Raman, N. (2004). Viral marketing or electronic word-of-mouth advertising: Examining consumer responses and motivations to pass along email. Journal of Advertising Research, 44(4), 333–348.
- 37) Reddy, P., & Kumar, D. L. K. (2018). A Study on Effectiveness of Social Media Advertising in India. SSRN Electronic Journal, 1–13. https://doi.org/10.2139/ssrn.2751745
- 38) Salloum, S. A., Al-Emran, M., Habes, M., Alghizzawi, M., Ghani, M. A., & Shaalan, K. (2019). Understanding the Impact of Social Media Practices on E-Learning Systems Acceptance. International Conference on Advanced Intelligent Systems and Informatics, 360–369.