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Smart Banking Services and Their Impact on the Mental Image of Commercial Bank Customers in UAE

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Abstract
This study aimed to identify smart banking services represented by (Internet of things, data collection, data analysis, and security) and their impact on the mental image represented by (the cognitive dimension, the emotional dimension, the behavioral dimension) of commercial bank customers in the UAE. A convenience sample consisting of 384 customers of commercial banks in the Emirates was selected, and the descriptive analytical approach was used, and it reached many results, the most important of which was the existence of a statistically significant impact of Banking services represented by (Internet of things, data collection, data analysis and security) depend on the mental image represented combined, which means that bank customers have all and accurate information that contributed to the formation of a positive mental image and raised their confidence and satisfaction with these banks.In light of the results reached, the study recommended working on the development of smart banking services in all its dimensions and interest in providing bank customers in the UAE with more information about the Internet of Things, which contributes to improving the mental image of it, and given the importance of the subject in our current era, the study recommended the need to apply it to sectors other.
Keywords: Smart banking services, mental image, bank customers, United Arab Emirate
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1.Introduction

Our world has witnessed, in a short period, a huge and remarkable development in the Internet, as it has become a global entity that extends to all different, and for this reason, the interest in technological development has been rapid and increasing. It was recently noticed that the adoption of modern technological concepts comes from businessmen, managers, and stakeholders, and for this reason, technology is currently changing the shape of the market and creating a virtual market and virtual customers regardless of their geographical locations. This creates more marketing and performance improvement opportunities in the business world. (Hashem, 2021)

The banking sector is one of the most rapidly growing industries as it provides a wide variety of financial services to customers in a variety of forms and different ways, including electronic banking services as well as services provided by mobile phone, in addition to that automated teller centers (Manikandan, and et al 2011)

In our current time with the development of electronic commerce and digital societies, electronic banking services are considered an important part of the daily life of individuals and large and small institutions as well, with the increase in the use of smartphones, it seems that smart banking services are the appropriate solution for dealing with transactions, transfer requests, payment services and loans that can be Getting them through smartphones (Bucko, 2017).

As this continuous development of smart banking services via the Internet has led to a change in the habits used by banks in their routine transactions with customers, smart banking services can provide online a range of various banking transactions for consumers using smart tools that include applications and websites affiliated with banks. (ALHOSANI, and TARIQ, 2020) Whereas, smart banking services have gained great importance among consumers in recent years, as banks have adopted the latest technologies to deal with our technologically competitive era by improving performance, reducing costs, expanding the market, revealing more products, and working to form a mental image among Customers of commercial banks and conduct their transactions in a timely and accurate manner.

Smart banking services can provide instant information and solutions. Customers can access their accounts and transfer their money easily and with very high security. By connecting to the Internet 24 hours a day, seven days a week, they can get existing smart banking services with all the information they need. They also enable them to open their new bank accounts. Within minutes, smart banking services can also provide smart payment methods such as Apple Pay and Samsung pay.

2. Problem of the study and its questions

The tremendous development in the use of software and the efficiency of its performance, the expansion of the adoption of huge databases, as well as the remarkable progress in machine learning applications and the preparation of algorithms. All this attracted the interest of the commercial sector, which contributed to the expansion of the production and application of these technologies, and opened the door to investment in artificial intelligence technologies.

Artificial intelligence is part of smart banking services. This type provides many features, including the feature of self-learning using devices. It receives a huge amount of data and then analyzes it. The aim is to know the preferences and priorities of individuals and to meet them first, and for this reason smart banking services have become Of great importance.

And since artificial intelligence is a set of technologies that give computers new capabilities that allow them to solve problems that were previously limited to humans, today data science is one of the most important disciplines in the digital world with the widespread spread of the Internet and virtual systems that contain a large amount of data. Data that can be relied upon and analyzed to achieve results for decision-making in various sectors.

Smart banking services were defined as the most intelligent way to conduct transactions in order to benefit from any commercial business for both the seller and the customer. With the advent of big data, these services become clearer, as technology had an impact on banks in providing an insight into customer behavior, which allows banks to make strategic decisions aimed at meeting Customer needs, meeting their desires, and providing desired services.

There is intense competition in our world today in presenting a mental image between institutions in the labor market, which is considered one of the most important functions of institutions and the basis for their success. So, it must be taken into account, and this is due to the value that a mental image can add to service institutions such as commercial banks.

Based on the scarcity of topics and after an extensive study according to the researcher's experience from previous studies related to smart banking services and knowledge of its impact in many aspects, this study came to answer the following main question:

What is the impact of smart banking services on the mental image of customers of commercial banks in the UAE?

3.Study hypotheses

The main hypothesis:

H0: There is no statistically significant impact at the significance level ($\alpha \leq 0.05$)of the Smart banking services represented by (INTERNET OF THINGS , data collection, data analysis, and security)on the mental image represented by (cognitive dimension, emotional dimension, behavioral dimension) on commercial bank customers in UAE.

The following sub-hypotheses are derived from it:

The first sub-hypothesis:

H01: There is no statistically significant impact at the significance level ($\alpha \leq 0.05$) of the Smart banking services represented by (Internet of things, data collection, data analysis, and security) on the cognitive dimension of commercial bank customers in UAE.

The second sub-hypothesis:

H02: There is no statistically significant impact at the significance level ($\alpha \leq 0.05$) of the Smart banking services represented by (INTERNET OF THINGS , data collection, data analysis, and security) on the emotional dimension of commercial bank customers in UAE .

The third sub-hypothesis:

H03: There is no statistically significant impact at the significance level ($\alpha \leq 0.05$) of the Smart banking services represented by (INTERNET OF THINGS , data collection, data analysis, and security) on the behavioral dimension of commercial bank customers in UAE.

4.Study model

Figure (1) illustrates the model of the hypothesis which will be used in this study. The variables that will be used in this study is prepared by the researcher based on previous research as illustrated in Table (1).

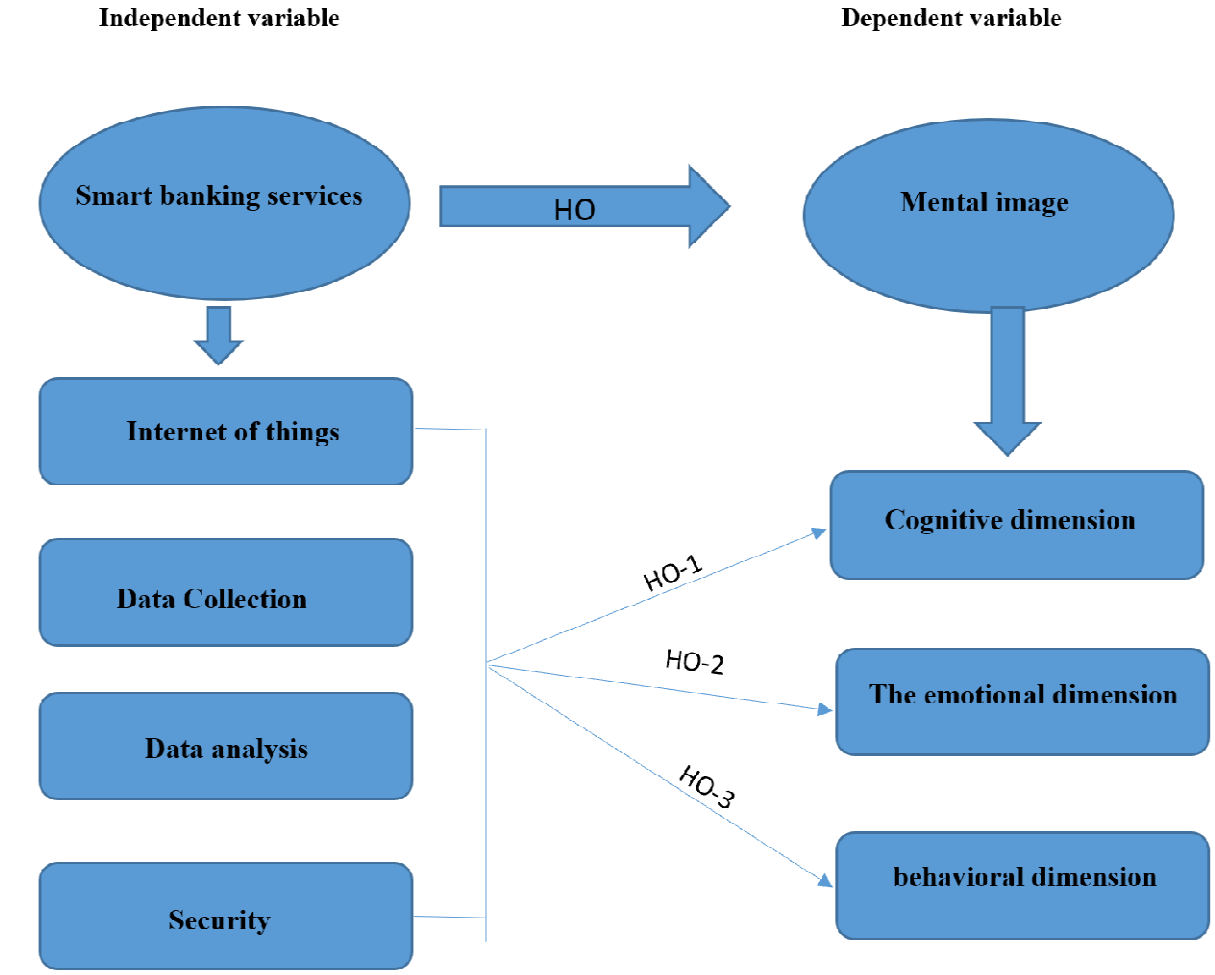

Figure (1-1)

5.Study methodology

This study is based on the descriptive analytical method, to achieve the objectives of this study to identify Smart banking services and their impact on the mental image of commercial bank customers in UAE,The data was collected by reviewing the theoretical literature and previous studies related to the subject of the study. The quantitative survey questionnaire was used to obtain data from the sample of the study sample,This method is based on a scientific, accurate and integrated description of the existing situation or problem using a descriptive analysis. It is also based on the facts associated with it and unlimited to describing the phenomenon. It includes analysing data, measuring, and interpreting it, arriving at an accurate analysis and results using statistical and inferential analysis and evaluating solutions and proposals to address them.

Statistical treatment

To process the data collected through the questionnaire study tool, the researcher used the Statistical Package for Social Sciences V (25) (SPSS), and the following statistical methods were applied:

- Frequencies and percentages to identify the demographic distribution of the study sample, as well as to identify the average responses of the study sample to the questionnaire paragraphs.
- The arithmetic means (means) of the study sample's responses to the questionnaire paragraphs.
- Cronbach-alpha was calculated to identify the internal consistency of the paragraphs of the questionnaire.
- The standard deviation of the dimensions and their total score (n = 285), to identify the level of data dispersion from its arithmetic mean.
- Person correlation coefficient.
- Multicollinearity test through the Variance Inflation Factor (VIF) test and the Tolerance test to ensure that there is no linear interference between the variables of the study.
- Simple linear regression to identify the impact of the independent variable with its combined dimensions on the dependent variable with its combined dimensions.

- Multiple regression analysis to identify the impact of the independent variable with its combined and separate dimensions on each dimension of the dependent variable.

6.DATA ANALYSIS AND HYPOTHESIS TESTING:

Means and standard deviations were extracted for Smart Banking Services scale dimensions (The Internet of Things, Data collection, Data analysis, and Security).

Statistical analysis of the answers of the study sample on the paragraphs of the independent variable mental image scale

Means and standard deviations were extracted for mental image dimensions (Cognitive, Emotional, and Behavioural); the tables below illustrate this.

Table (1-1) Means and standard deviation for mental image scale dimensions (n=384)

No	Dimension	Mean	Standard Deviation	Agreement Degree
1	Cognitive	3.99	0.62	High
2	Emotional	4.07	0.66	High
3	Behavioural	3.97	0.69	High
Total degree of mental image scale		4.02		High

Table (4-6) shows that the highest means reached (4.07) out of (5) for dimension no.(1) "Emotional" by high agreement degree, but the lowest means was (4.97) for dimension no.(3) "Behavioural" also by high agreement degree, and Total degree of mental image scale means reached (4.02) by high agreement degree.

1- Analysing the responses of the study sample to the first dimension of mental image (Cognitive).

Table (1-2) Descriptive analysis of the answers of the study sample on the "Cognitive dimension (n= 384)

No	Item	Mean	Standard. Deviation	Agreement Degree	Rank
1	I have enough information about the bank.	3.96	0.85	High	5
2	I got information about the bank through friends and acquaintances.	3.82	0.91	High	6
3	I can know the locations of the bank's branches through the bank's smart application.	4.10	0.85	High	1
4	I have a better perception of the bank compared to the image of other banks.	4.01	0.83	High	3
5	The bank is characterized by honesty and transparency in dealing.	3.98	0.86	High	4
6	I can get all the information I want about my banking dealings with the bank through the bank's electronic channels.	4.07	0.83	High	2
Total degree of Cognitive dimension		3.99		High	

Table (4-7) shows that the highest means reached (4.10) out of (5) for item No. (1) "I can know the locations of the bank's branches through the bank's smart application" by high agreement degree, but the lowest means was (3.82) for item No. (2) "I got information about the bank through friends and acquaintances" also by high agreement degree, and means reached (3.99) for total degree of Cognitive dimension by high agreement degree.

2- Analysing the responses of the study sample to the second dimension of mental image (Emotional).

Table (1-3) Descriptive analysis of the answers of the study sample on the "Emotional" dimension (n= 384)

No	Item	Mean	Standard. Deviation	Agreement Degree	Rank
1	I feel relieved by the way the staff treats me at the bank.	4.06	0.85	High	5
2	The bank is characterized by accuracy and smart banking services.	4.15	0.72	High	1
3	The bank has comfortable accommodations and a courteous reception.	4.08	0.81	High	3
4	I have a good picture of the bank in my mind.	4.08	0.78	High	4
5	I feel comfortable and safe dealing with the bank.	4.15	0.75	High	2
6	I feel affiliated with the bank for its excellent dealings with me.	3.94	0.92	High	7
7	The staff is ready to provide assistance regarding the smart application at any time.	4.05	0.83	High	6
Total degree of Emotional dimension		4.07		High	

Table (1-4) shows that the highest means reached (4.15) out of (5) for item No. (2) "The bank is characterized by accuracy and smart banking services" by high agreement degree, but the lowest means was (3.94) for item No. (6) "I feel affiliated with the bank for its excellent dealings with me" also by high agreement degree, and means reached (4.07) for total degree of Emotional dimension by high agreement degree.

3- Analysing the responses of the study sample to the third dimension of mental image (Behavioural).

Table (1-5) Descriptive analysis of the answers of the study sample on the "Behavioural" dimension (n= 384)

No	Item	Mean	Standard. Deviation	Agreement Degree	Rank
1	I recommend my acquaintances and friends to deal with the bank.	4.01	0.87	High	4
2	It is not possible to deal with other banks instead of the one I am currently dealing with.	3.64	1.05	Medium	5
3	I have a positive attitude towards the information issued by the bank.	4.02	0.70	High	3
4	I am satisfied with the banking services provided by the bank.	4.07	0.77	High	2
5	I am attracted to dealing with the current bank for providing distinguished electronic banking services.	4.10	0.78	High	1
Total degree of Behavioural dimension		3.97		High	

Table (4-9) shows that the highest means reached (4.10) out of (5) for item No. (1) "I am attracted to dealing with the current bank for providing distinguished electronic banking services" by high agreement degree, but the lowest means was (3.64) for item No. (2) "It is not possible to deal with other banks instead of the one I am currently dealing with" by Medium agreement degree, and means reached (3.97) for total degree of Behavioural dimension by high agreement degree.

Testing the normal distribution of the study data

The normal distribution test is one of the assumptions of using simple and multiple regression analysis, as the application of regression analysis requires that the data be distributed normally, and in the event that the data is not distributed normally, it must be treated before starting using the regression analysis, and accordingly, the researcher has conducted a set of tests to verify the integrity Data, including the following:

First: the normal distribution using the Kolmogorov - Smirnov test (KS - test), where this test is used to verify the normal distribution of the study data, and the decision rule is that the data is normally distributed if the value of (p-value ≥ 0.05)

Table (1-6) Kolmogorov - Smirnov test (KS - test) for normal distribution

Dimensions/scale	Z value	Sig.
Cognitive	1.608	0.211
Emotional	1.664	0.318
Behavioural	0.984	0.288
Total of mental image scale	0.936	0.345

Table (4-10) shows that the levels of statistical significance for (Z) values in the Sample K-S test for dimensions were not statistically significant at the level of (5%), which shows that the data of the dimensions follow the normal distribution, and suitable for conducting Multiple regression analysis.

Second: Linear interference analysis using Multicollinearity

Multi-Collinearity is referred to the fact that there is a high correlation between more than two independent variables. This in turn, led to make the values of β for each variable to be interchangeable. Therefore, and to avoid this problem, the Collinearity Diagnostic test has been examined. In addition, the value of variance of inflation (VIF) should be lower than (10) and the Tolerance value should be higher than (0.1). (Gujarati and Porter, 2003)

In order to verify the results of the homogeneity of the variance of the independent variables: Smart Banking Services scale dimensions (The Internet of Things, Data collection, Data analysis, and Security), Tolerance test and VIF test were applied. Table (4-11) shows that.

Table (1-7): The results of Tolerance and VIF

Independent variable/ Smart Banking Services scale dimensions	VIF	Tolerance
The Internet of Things	.446	2.244
Data collection	.277	3.612
Data analysis	.307	3.254
Security	.536	1.867

It is noted from Table No. (4-12) that there is no linear overlap between the variables of the independent

study, as the basis for the decision to judge this is that the permissible variance inflation coefficient (VIF) does not exceed the value (10), And that the Tolerance value is greater than (0.05), and in light of the decision rule, we find that all (VIF) values were less than (10), while all Tolerance values were greater than (0.05), which means that there is no linear overlap between the independent study variables, as shown in the table the value of the skewness coefficient should fall within (±1), which indicates the validity of the data for the assumptions of regression analysis directly and without data processing.

Third: Pearson correlation coefficient

Table (1-8) The results of Person correlation coefficient between Smart Banking Services scale dimensions (The Internet of Things, Data collection, Data analysis, and Security), and mental image dimensions (Cognitive, Emotional, and Behavioural)

		The Internet of Things	Data collection	Data analysis	Security	Smart Banking Services
Cognitive	Pearson Correlation	.580**	.746**	.717**	.615**	.769**
	Sig. (2-tailed)	0.000	0.000	0.000	0.000	0.000
	N	384	384	384	384	384
Emotional	Pearson Correlation	.513**	.611**	.574**	.555**	.651**
	Sig. (2-tailed)	0.000	0.000	0.000	0.000	0.000
	N	384	384	384	384	384
Behavioural	Pearson Correlation	.480**	.606**	.584**	.518**	.632**
	Sig. (2-tailed)	0.000	0.000	0.000	0.000	0.000
	N	384	384	384	384	384
Mental image scale	Pearson Correlation	.572**	.712**	.679**	.615**	.745**
	Sig. (2-tailed)	0.000	0.000	0.000	0.000	0.000
	N	384	384	384	384	384

* Coefficients significant at ($\alpha \leq 0.05$)

** Coefficients significant at ($\alpha \leq 0.01$)

Table (1-9) shows that there are statistically significant positive relationship between Smart Banking Services scale dimensions (The Internet of Things, Data collection, Data analysis, and Security), and mental image dimensions (Cognitive, Emotional, and Behavioural), by sig (.000).

7.Conclusions and Recommendations

Based on the results of the analysis presented in the previous chapter, the following conclusions are drawn:

1. The main hypothesis of this study stated that there is no statistically significant impact at the significance level ($\alpha \leq 0.05$) of the Smart banking services represented by (INTERNET OF THINGS , data collection, data analysis, and security) on the mental image represented by (cognitive dimension, emotional dimension, behavioral dimension) on commercial bank customers in UAE. After conducting the necessary tests on the data of the study, it was found that there is no statistically significant impact at the significance level ($\alpha \leq 0.05$) of dimension (INTERNET OF THINGS) on the mental image represented (cognitive dimension, emotional dimension, behavioral dimension) on commercial bank customers in UAE. That is, the application of Internet of Things technology by banks in the UAE does not reflect any impact on the mental image in its three dimensions on the customers of these banks, and does not have any impact on the emotional, behavioral and cognitive side formed by them. The study of (Ramalingam and Venkatesan, 2019) had a contrary opinion to the result of our study, as this study showed that banking services are considered one of the areas that can benefit from the technology of the Internet of Things, as their use of this technology helps to meet expectations and achieve satisfaction and customer orientations and thus raise the performance of banks and increase its profitability. It has also been shown that there is statistically significant impact at the significance level ($\alpha \leq 0.05$) of the Smart banking services represented by (Data collection, data analysis, and security)on the mental image represented by (cognitive dimension, emotional dimension, behavioral dimension) on commercial bank customers in UAE. This result can be explained by the fact that banks in the UAE provide smart banking services in all its dimensions (data collection, data analysis, security), which will positively reflect on the mental image formed by customers in terms of cognitive, emotional and behavioral aspects, which will motivate these customers to deal with these banks more and thus achieve These banks have the most important goal, which is profit. The study (ALHOSANi AND TARIQ,2020) came

to support the result of our study and confirm that smart banking services (data collection, data analysis, and security) have a positive impact on customer satisfaction. As for the (Hussien,2022) study, it confirmed that the use of modern and smart banking methods and technologies leads to enhancing the mental image of customers. While the study (Al-Bahi, 2016) showed that the quality of banking services and the use of smart technologies and services in them has a significant impact on customer satisfaction, which contributes to these banks achieving competitive advantage and maintaining their position in the banking sector. A study (Qawi, 2018) came to indicate that there is a direct relationship between the increase in the volume of smart banking services and the increase in attracting customers and increasing their confidence in Sudanese banks. The study (Ghiad, 2021) confirmed to me that there is customer satisfaction with the smart banking services provided to them in its dimensions (data collection, data analysis, and security). As the availability of these services contributes to ease of use, security, confidentiality and quality of information to customers, which supports their confidence and enhances the positive mental image they have.

2. The first sub-hypothesis states that there is no statistically significant impact at the significance level ($\alpha \leq 0.05$) of the Smart banking services represented (INTERNET OF THINGS , data collection, data analysis, and security) on the cognitive dimension of commercial bank customers in UAE. After conducting the necessary tests on the data of the study, it was found that is no statistically significant impact at the significance level ($\alpha \leq 0.05$) of the Smart banking services with its dimension (INTERNET OF THINGS) on the cognitive dimension of commercial bank customers in UAE. While it was found that there statistically significant impact at the significance level ($\alpha \leq 0.05$) of the Smart banking services represented (data analysis, data collection, security) on the cognitive dimension of commercial bank customers in UAE. This result can be justified by the fact that although the two dimensions of the Internet of Things and data analysis help in providing banking services of high quality, they do not have any impact on the cognitive mental image of bank customers in the UAE, which means that customers of UAE banks do not have clear and accurate information about These dates and they do not have a clear picture of how to use them, which was reflected in the mental image that they had. As for the two dimensions (data collection and security), it had a clear impact on the mental image of bank customers in the UAE, which means that the customers of these banks possess sufficient and accurate information that contributed to creating a positive mental image that raised their confidence and satisfaction with these banks. The study of (Atieh,2020) had a similar opinion to our study, as it indicated that adopting banks to provide smart banking services that include providing sufficient information and providing a high degree of security leads to creating a clear mental image among their customers. As for the study (Ahmed, 2021), it showed that smart banking services that enjoy a high degree of confidentiality lead to attracting customers, as providing these services, facilitating their use, and providing sufficient information about them leads to improving the image of banks with customers and thus attracting them to deal with them, and providing security and protection In these services, the confidentiality of customer data is maintained, thus creating a positive cognitive image that is reflected in their loyalty to these banks, and this was also confirmed by the study (Indyra,2021).
3. The second sub-hypothesis states that there is no statistically significant impact at the significance level ($\alpha \leq 0.05$) of the Smart banking services represented (INTERNET OF THINGS , data collection, data analysis, and security) on the emotional dimension of commercial bank customers in UAE. After conducting the necessary tests on the data of the study, it was found that is no statistically significant impact at the significance level ($\alpha \leq 0.05$) of the Smart banking services represented (INTERNET OF THINGS , data analysis) on the emotional dimension of commercial bank customers in UAE. While it was found that there statistically significant impact at the significance level ($\alpha \leq 0.05$) of the Smart banking services represented (data collection, security) on the emotional dimension of commercial bank customers in UAE. This hypothesis can be justified by the fact that the Internet of Things and data analysis dimensions have no impact on the emotional mental image of UAE bank customers. As for the dimensions (information collection and security), they greatly affect their emotional perceptions. for the benefit achieved from it, so it pushes him positively to deal with it and be loyal to it, or it pushes him negatively towards moving away from it and finding an alternative, The customer's affection is affected by psychological reinforcement and reinforcement, and he has self-motivations to deal with these banks, which raises his formed loyalty towards them. The study (Abedalla and Suhaiby,2020) confirmed that the provision of smart banking services in its various dimensions had a positive role on customer satisfaction and provided a positive mental image for him. As for the study (Mahmoud, 2021), it showed that there are statistically significant differences in customers' emotional attitudes and their perceptions towards banking services. smart. While the study (Al-Hajj, 2012) proved that there is a statistically significant relationship to the dimensions of various banking services on achieving loyalty

and continuity for customers in Jordanian commercial banks. The study (Obaid, 2021) showed that the dimensions of smart banking services clearly affect the customers' preferences and the extent of their trust, loyalty, and commitment to dealing with the Palestine Islamic Bank. (Kheng et al.,2010) study indicated that the quality of banking services in Malaysian banks enhances the positive mental image formed by customers and strengthens their sympathy and loyalty with these banks.

4. The third sub-hypothesis states that there is no statistically significant impact at the significance level ($\alpha \leq 0.05$) of the Smart banking services represented (INTERNET OF THINGS , data collection, data analysis, and security) on the behavioral dimension of commercial bank customers in UAE. After conducting the necessary tests on the data of the study, it was found that is no statistically significant impact at the significance level ($\alpha \leq 0.05$) of the Smart banking services represented (INTERNET OF THINGS) on the behavioral dimension of commercial bank customers in UAE. While it was found that there statistically significant impact at the significance level ($\alpha \leq 0.05$) of the Smart banking services represented (data analysis, data collection, security) on the behavioral dimension of commercial bank customers in UAE. This result can be justified by the fact that although the Internet of Things dimension helps banks to provide high-quality services and contributes to facilitating their performance, it does not have any impact on the behavioral mental image formed by Emirati bank customers, while the dimensions (information collection, data analysis, security) They play a clear role in shaping the behavioral mental image of customers, and these dimensions represent the customer's destination and the reflection of his expectations and satisfaction with the services of UAE banks, and accordingly his actual behavior is shaped by satisfaction and acceptance of dealing with these banks. Therefore, the study (Mehaeaj and Shaik,2019) proved that the provision of smart services by banks in India contributes to increasing customer awareness and thus directing their behavior towards dealing with these banks. As for the study (Nayanajith et al.,2021), it supported the idea that banks' determination to provide smart services with different dimensions reflects positively on the behavior of their customers.

8.Recommendations:

Based on the results of the study, the researcher recommends the following:

a. Work on developing smart banking services in all its dimensions due to its clear impact on customer orientations in the UAE.
b. Show methods and banking services other than those mentioned in this study.
c. Increasing the degree of awareness of employees of UAE banks of the importance of forming a positive mental image in all cognitive, emotional and behavioral aspects among the customers of these banks.
d. Interest in providing bank customers in the UAE with more information and experiences about the Internet of Things, which contributes to improving the mental image they have about it

In view of the importance of this topic in our current era, our study recommends the need to apply it to other sectors.

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