Factors Behind Virtual Assistance Usage Among iPhone Users: Theory of Reasoned Action

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Abstract—Smartphone usage is increasing due to several features and opportunities offered by the manufacturers and service providers. Existing literature attributes this increased usage to the availability of virtual assistants, mainly voice assistants, that ensure users' facility and maximum benefit. This research also focused on the factors behind voice assistant usage, particularly in iPhones among users in the United Arab Emirates. Notably, the conceptual framework in this research is supported by the Theory of Reasoned Action. The researchers adopted a cross-sectional design and gathered data from $n= 251$ respondents. Data analysis through Structural Equation Modelling revealed that, Perceived Ease of Use, Subjective Norms, and Perceived Behavioral Control work as significant factors contributing to iPhone-based voice assistant usage. On the other hand, Expectation Confirmation also works as a significant factor in Siri usage. On the other hand, Satisfaction significantly mediated ($p> .022$) the users' Expectation Confirmation leading to Siri usage among the respondents. Further, the Artificial Neural Network Analysis (ANN) revealed an overall accuracy regarding Training at 14.8% and 30.8% concerning Testing. Thus, it is concluded that the devices accompanied by ease of use are preferred due to their distinguished services. In this regard, highlighting voice assistants' help also reflects the importance of technology in our daily lives. Especially mobile computing is playing a significant role in improving our everyday technology experiences.

Keywords—Artificial Intelligence, mobile-computing, iPhone, Siri, voice assistance, United Arab Emirates

1 Introduction

Communication between humans and computers is not a new phenomenon. It can be traced back to the 1960s when the first language processing program, "E.L.I.Z.A.," was developed by Joseph Weizenbaum. Voice recognition in the 1970 and later, more improvements took place, which is continued to date [1]. Today the rise of Information Technology (I.T.) is also adding more to facilitate our daily life activities. This technology is mainly accompanied by ease of use and ease of access. We have seen tremendous growth and development, primarily in internet and mobile technology [2].

[3] further acknowledged the technology and considered current development due to advances in machine learning that the virtual assistant created by Google, Apple, and Amazon have become popular among the users. Here [4]. cited an example of virtual assistants as one of the most significant parts of the technology. According to [5]., these virtual assistants learn over time and gather information about the user's daily preferences, and get even smarter. Notably, these virtual assistants are part of Artificial Intelligence, as they recognize faces, communicate with other smart devices, and understand natural language. As noted by [6], virtual assistants can do everything from web searching to telling jokes, operating items, and even controlling home appliances. They can respond to voice commands, make phone calls, send messages, and set up reminders. According to [7], the current trends in technology and Artificial Intelligence indicate that this technology will grow more, and we experience this technology in our regular smart devices. These Virtual Assistants provide us a unique opportunity to experience a digital environment where Artificial Intelligence is augmenting human functions [8]. Most importantly, I.T. companies worldwide are proposing "out of the box" AI-enabled solutions to solve even complex human problems [9].

Similarly, smart mobile phones contain these virtual assistants as part of their programs as the main aim is to provide the user with maximum ease of usage [10]. Here [11] cited an example of Siri, which is created and owned by Apple Inc. as a pioneer in Artificial Intelligence and cloud computing. Apple devices, particularly the iPhone, contain Siri [12], which is based on Artificial Intelligence and provides maximum support to its users [13]. According to [14], the utility of Siri can be determined by the fact that it even helps to upload Facebook posts, helps to find restaurants nearby, and calculate the currency rates through a voice recognition system. It is notable that, with the increased popularity of Apple products and their mobile computing program, today, apple products are among the most preferred ones. Their popularity is prominent, especially in the developed regions like the United Arab Emirates, where technological transformation and adaptation are widely preferred [15]. Statistics in 2017-2018 showed that 82% of devices registered in the United Arab Emirates were smart mobile phones, and iPhones dominated this registration process. Today, iPhone has 24.33% of the market share in the United Arab Emirates. Hence, this market share indicates the growing popularity of the iPhone in the U.A.E., which further magnifies the importance of services and features offered by Apple Inc [16].

Thus, many studies have witnessed the importance of virtual assistance, especially working through voice recognition systems [17]. Existing literature considers these AI-enabled smartphones to gain popularity among young and old generations [13], [18]–[20]. By keeping in view the importance of the Apple iPhone in the United Arab Emirates in terms of its AI-enabled services (Virtual Assistance) and its wider adoption, this research also focuses on the factors that contributed to growing iPhone acceptance in the country. The researchers have adopted an exploratory approach; as yet, no study in the U.A.E. has examined the factors behind iPhone usage, especially its virtual assistance services. This study is divided into five sections ranging from an Introduction to a review of literature, theoretical framework, methodology, data analysis, and finally, a discussion of results. Further, study limitations and recommendations are also discussed accordingly.

2 Literature review

2.1 Perceived ease of use and perceived behavioral control

Technology and software providers have made significant investments in executing complex information systems to achieve a relative advantage during the past few years [21]. As a result, adopting and implementing Artificial Intelligence have become a core consideration for many companies worldwide. Notably, these companies consider easy usage accompanied by customers' facilities as one of the core considerations of their products and services [22]. According to [23], ease of use works as one of the motivation factors that helps customers select the most favorable and relevant product. They believe that products with affordable prices providing less effort usage can help them organize and perform their day-to-day activities. Here [24] argued that if a company focuses on consumer psychology, ease of usage works as one of the significant considerations for the customers leading them to accept the product and services they want [25].

A study conducted by [23] further examined the role of perceived ease of use in customers' A.I. acceptance in South Korea. The researchers applied the case study method and found that ease of use remained a dominant factor in increasing the users' purchase intentions. However, researchers also proposed that users' A.I. acceptance also depends on their interest in technology and its usage. [26] cited an example of smartphone usage regarding their AI-enabled virtual assistance in dealing with banking applications. Smartphone users consider virtual assistance due to its ability to recognize the user and strong privacy policies. Using voice command, paying utility bills, making hotel reservations, and even scheduling gym visits are all accompanied by users' maximum ease of use and comfort [27].

H1: Perceived Ease of Use has a significant impact on Perceived Behavioral Control

2.2 Perceived ease of use and subjective norms

On the demand side of global and local markets, the customers mainly prefer smart mobiles for improved experiences [28]. With strong positive trends in technology adoption and a brisk advancement in technology today, stakeholders anticipate a boom in technology. This is due to the users' continuously growing interest and demand for improved technological experiences [29]. In addition to increased demand from the users, the company's strategic plan to relate technology with the consumers' needs also plays an important role in generalizing new trends and features in technology that users actively adopt. Given that, smart mobile adoption has become a trend that has aligned its features with the users' needs. Here, [30] cited an example of Apple Inc., whose products are reliable, have enhanced technology, and are in line with satisfying customers and achieving their loyalty.

A study conducted by [31] further examined the role of subjective Norms in adopting mobile payment systems. The researcher applied an exploratory approach and found subjective Norms/ normative as potentially correlated to the e-payment system. Notably, respondents also expressed the company's reputation and prior performance

in accepting mobile-based e-payment systems [32]. Thus, mobile phones and wireless technology provide a venue for improved customer experiences. Purchasing a smart mobile and sharing the experiences with others has further led to an increased adoption process. Users consider mobile phones to have simple functions, cost-effective rates, and increased internet accessibility adopt these smartphones as per their needs and desires [33].

H2: Perceived Ease of Use has a significant impact on Subjective Norms

2.3   Subjective norms and perceived behavioral control

Today, almost every gadget uses Artificial Intelligence [34]. Notably, Artificial Intelligence has gained much significance in many segments of users' lives. [35] further cited an example of AI-enabled mobiles in terms of healthcare. As noted, smartphones today have an amazing ability to remind us about our healthcare. They help to book an appointment with the doctor and give reminders, thus, leading to increased use of these smart devices. As a result, people are more likely to adopt technology, especially when it is primarily adopted and facilitates its users. According to [36], smart mobile phone adoption is a complex process. People who understand its usefulness know how these devices help to reduce the number of things they carry every day. As noted by [37], smartphones are increasing. Any smart device purchased by an individual is due to certain motivational factors. Among these factors, existing users' opinions and attitudes influence others' buying decisions [38].

A study conducted by [39] further examined the impact of social norms (trends) on buying behavior of others. Findings showed social norms remained a significant factor in influencing the users' behavior. However, these users mainly indicated social networks as providing them with information and helping in decision-making. Also validated [40], subjective norms are antecedents of one's technology adoption behavior. Especially these subjective norms are even more influential today when smartphones are improving and incorporating mobile computing as an important component of their software.

H3: Subjective Norms have a significant impact on Perceived Behavioral Control

2.4   Perceived behavior control and expectation confirmation

Confirmation of beliefs is an important cognitive process, indicating how one's expectations are fulfilled by taking a certain action [41]. This cognitive process plays an important role in one's decision-making process [42]. For example, if smartphone users find that their expectations are confirmed, they are more likely to adopt the services and features offered by the company. However, if these expectations are not fulfilled, it can cause a loss of interest and intention to try the same product or brand [43].

According to [44], expectation confirmation can also be described as realizing that the expected outcomes will be according to users' requirements. Existing research on technology and expectation confirmation found strong impacts of one's behavior on expectation confirmation [45]. In other words, [46] described it as a behavior working

as an indicator of the expectation confirmation process. The applications and services offered by service providers also keep expectation confirmation as a core consideration in their customer-centric approaches. In this regard, [47] argued that smartphones accompanied by AI-based virtual assistants fulfill the users' needs, indicating consistency in their buying behavior. It is asserted that expectation confirmation is an essential factor dominated by one's behavior leading to the expected outcomes [48].

H4: Perceived Behavior Control has a significant impact on Expectation Confirmation

2.5   Expectation confirmation and intention to use virtual assistant

According to [49], the application of virtual assistants is increasing in both professional and personal lives. Experts also suggested that by the end of 2021, the number of virtual assistant users will increase and double by 2023. [50] stated that, today, in the world of the Internet of Things (IoT), virtual assistance is an important addition to our communication and day-to-day activities. Popular virtual assistants such as Siri, Alexa, Cortana, and others are used mainly by smartphone users. Smart speakers, smart computer systems, tablet devices, smart watches, etc., All have AI-enabled virtual assistance services that distinguish their features, services, and qualities from the conventional media devices. Although virtual assistance first originated in 1910, its current form is considered the best due to its user-friendly system.

As noted by [51], one of the major benefits offered by cloud technology is that it facilitates work with virtual assistants. Savvy users having a tough work routine realize that virtual assistants perform many tasks that humans might miss. [52] consider virtual assistants as independent contractors that benefit users on both individual and organizational levels. Employing a reliable virtual assistant and having them work on some of your urgent tasks takes away the need for you to try to get two tasks done at the same time. When you multitask, it is difficult to complete both tasks to the best of your ability. For example, having an efficient and reliable virtual assistant helps to cope with the tasks having tight deadlines. Even if the user is a multitasker, the virtual assistant helps them focus on a single task and deal with the others effectively.

H5: Expectation Confirmation and Intention to Use Virtual Assistant

2.6   The role of satisfaction and attitude in intention to use Siri

Artificial Intelligence functions as merely a technology to perform everyday life functions. People preferring smartphones having AI-based voice assistance have concerns regarding the self-efficacy and problem-solving of the assistant [53]. According to [54], one of the primary reasons behind the successful integration of voice assistants is ensuring user satisfaction. A mobile company providing smart software with voice assistance services ensures that they may fulfill the users' expectations and demands. This user-centric approach further helps the consumers use, evaluate, and share their experiences with others.

Yet [55] noted that virtual assistants' topic and functional use varies from person to person. Here [56] cited an example of using voice assistants provided by Telkomsel's

Intelligent. Findings indicated that service quality offered by the virtual assistant further increases user satisfaction. These users also prefer virtual assistants in their homes, as Satisfaction is a prominent factor in their decision-making process.

[57] consider perceived service and interaction quality as components increasing users' Satisfaction and leading to a substantial adoption process. Smartphones positively influence one's overall product and service evaluation process. Individuals have positive experiences with their virtual assistants, leading to the use of the same services in the other smart devices. Further, [58] argued that emerging technology such as virtual assistants, augmented reality, and cloud computing reshapes the way individuals interact and perform day-to-day life activities. Today people actively search for smart devices to transform their digital experiences. [59] consider voice control as the future of human-computer interaction. Especially, increased mobile usage further led to the emergence of voice assistance facilities. Companies prefer virtual assistance as they work on facial and voice recognition systems. Virtual assistants depend on cloud-based architecture, sending data back to centralized data centers. Talking particularly about the voice assistant has a comparatively simple yet comprehensive system that people prefer to perform from basic to critical tasks. Here [60] cited an example of voice assistant adoption and usage for e-shopping purposes. The researchers examined how users' consideration mediates their virtual assistant adoption and usage purposes. Data gathered from $n= 657$ users in the U.S.A. revealed that overall positive Attitude toward virtual assistants. Her positive Attitude showed a potential mediating role in creating and sustaining positive attitudes among the users, mainly triggered by the ease of use, accessibility, and further features of the products.

H6a: Satisfaction mediates the impact of Expectation Confirmation on Intention to Use Virtual Assistant

H6b: Attitude mediates the impact of Expectation Confirmation on Intention to Use Virtual Assistant

3   Theory of reasoned action and Siri

Current research is supported by the Theory of Reasoned Action (T.R.A.). Developed by Icek Ajzen and Martin Fishbein in 1967, the current theory proposes certain factors as fulfilling a person's expectations when showing a favorable result [61]. According to [62], the theory of Reasoned Action is derived from existing research in persuasion and cognitive psychology. Thus, the researchers have adopted core variables (Subjective Norms, Intention, Attitude) from the theory of reason actions as determinants of Siri adoption. Figure 1 illustrates the conceptual model of current research. As noted by [63], Siri as a popular virtual assistant, provides powerful support to human-computer interaction. Siri provides services that are usable even for motor and sensory disabled individuals. According to [64], one of the primary reasons behind increased voice assistant usage is that intelligent systems have many linguistic data. Besides, highly successful machine learning approaches also enhance methods and systems that can understand and comprehend human language, making virtual assistants more efficient and increasing their acceptance among the users [60].
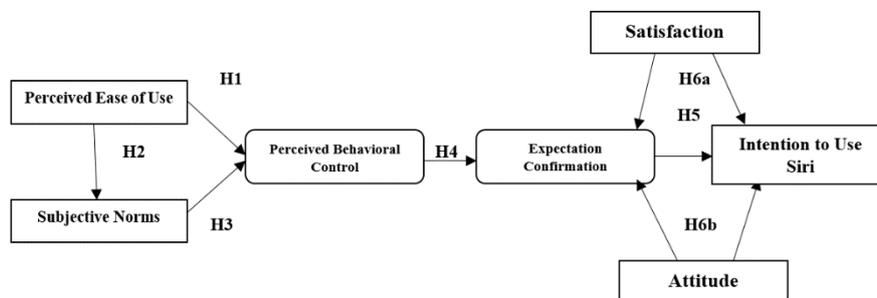
Fig. 1. Conceptual model of current research

4 Research methods

The current research is based on a cross-sectional design. As noted by [65], cross-sectional designs are short-term studies providing generalizable results to the researchers. Further, the researchers used self-proposed, structured questionnaires based on a five-point Likert scale [66]. The data were obtained by sending the questionnaires through emails. Later, the researchers used I.B.M. Amos and Statistical Package for Social Sciences (S.P.S.S.) to analyze the gathered data. The researchers conducted both descriptive and inferential statistics using the relevant software.

4.1 Sampling method

The population of current research involves all the smart mobile users in the United Arab Emirates. However, to further narrow down the data gathering process, the researchers randomly selected a sample of *n*=260 respondents. However, selecting the relevant sample size remained justified as [67] suggests that studies having Structural Equation Modeling should contain a minimum sample size of *n*= 200 participants. Moreover, the researchers used convenient sampling to select suitable respondents. As noted by [68], convenient sampling has prominent limitations attributed mainly to the researchers' own bias. Yet, it is one of the most preferred sampling approaches in the social sciences.

4.2 Response rate and informed consent

As mentioned earlier, the researchers selected a sample of n= 260 participants, and they received n= 251 as filled. As n= 9 questionnaires were missing, the overall response rate remained 95.6%. Moreover, by keeping in view the importance of informed consent [69], the researchers also provided all the important details, i.e., the purpose of the study, significance of outcomes, etc., to the respondents. Besides, respondents were also free to withdraw from recording their responses anytime they wanted without further obligations.

5   Data analysis and findings

5.1   Convergent validity analysis

According to [70], checking the validity and reliability of the measurement tool is an important step in structural equation modeling (S.E.M.). This step is known as measurement model analysis, indicating the internal consistency of survey items. Thus, this research also contains a measurement model analysis. For this purpose, the researchers first examined the convergent validity of the measurement model, including Factor Loading, Average Variance Extracted, Composite Reliability, and Cronbach Alpha values. First, the calculation of Factor Loadings of research items revealed that most values exceed the threshold value of 0.5. Secondly, the researchers also found the Average Variance Extracted values as higher than the threshold value of 0.5 (.729 to .946).

Similarly, regarding the Cronbach Alpha, the researchers found all the values ranging from .742 to .886. Also, the Composite Reliability values range from .761 to.811 Hence, we found that values from both Cronbach Alpha and Composite Reliability exceed the threshold values of 0.7, indicating that convergent validity is affirmed. Table 1 summarizes the results of the convergent validity analysis.

Table 1. Convergent validity assessment

Constructs	Items	FL	AVE	CA	CR
Perceived Ease of Use	PEU1	.817	.800	.886	.790
	PEU2	.845			
	PEU3	.739			
Subjective Norms	SNM1	.714	.775	.762	.761
	SNM2	.706			
	SNM3	.836			
Perceived Behavioral Control	PBC1	.789	.795	.742	.811
	PBC2	.756			
	PBC3	.834			
Expectation Confirmation	EPC1	-.014	.729	.767	.778
	EPC2	.751			
	EPC3	.708			
Intention to Use Siri	SIRI1	.966	.946	.760	.804
	SIRI2	.955			
	SIRI3	.918			
Attitude	ATD1	.910	.918	.810	.800
	ATD2	.927			
	ATD3	.007			
Satisfaction	SFS1	.872	.902	.807	.712
	SFS2	.895			
	SFS3	.910			

5.2 Discriminant validity

Two-criterion is important to examine the discriminant validity of the measurement model: Fornel-Larcker Criterion and Heterotrait-Monotrait Ratio [71]. Thus, to check the discriminant validity in current research, the researchers first used the Fornell-Larcker Criterion. All the squares of the Average Variance Extracted values (.531 to .894) are larger than the correlation values in Table 2 below. Further, the researchers used the Heterotrait-Monotrait ratio scale (See Table 3). Results revealed the H.T.M.T. value at .343, indicating that it is lower than the threshold value of 0.9, as suggested by [72]. Thus, it is assumed that the discriminant validity is established.

Table 2. Fornell-Larcker criterion

	PEU	SNM	PBC	EPC	SFS	AND	SIRI
PEU	.640						
SNM	.568	.600					
PBC	.001	.215	.632				
EPC	.554	.381	-.064	.531			
S.F.S.	.028	-.019	-.016	-.096	.894		
A.T.D.	-.007	.187	.218	.096	.000	.842	
SIRI	-.086	-.081	.032	-.161	.564	.161	.813

Table 3. Heterotrait-Monotrait ratio scale

	PEU	SNM	PBC	EPC	SFS	ATD	SIRI
PEU							
S.N.M.	.641						
P.B.C.	-.069	.284					
EPC	.816	.586	-.080				
S.F.S.	.041	-.041	-.100	-.068			
ATD	.031	.321	.566	-.006	.056		
S.I.R.I.	-.095	-.064	.052	-.198	.765	.179	

5.3 Goodness of fit

Finally, as the third step in measurement model analysis, the researchers examined the goodness of fit. As noted by [73], the goodness of fit helps determine the extent to which the observed data fit the data distribution. Thus, model fit in the current research indicated the chi-square value at $x^2= .463(12)$ and probability value at .001. Also, the Standardized Root Mean Square (R.M.S.E.A.) value at .230 is smaller than the threshold value of .85. Thus, it is found that the measurement model is efficient for structural model analysis. Figure 2 illustrates the goodness of fit after eliminating the certain constructs:
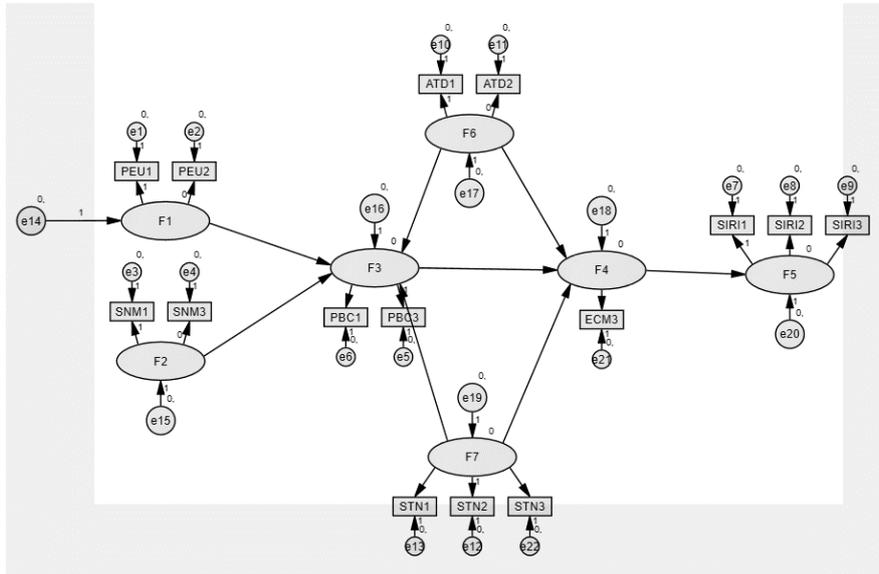
Fig. 2. Goodness of fit

5.4 Structural model analysis

Coefficients of determination R2. As the first step of structural model analysis, the researchers examined the predictive power of the endogenous variables by using the Coefficients of Determination R^2. As shown in Table 4, the R^2 values of all the latent variables range from 000 to 000, indicating that the predictive power of the exogenous variable is fundamental.

Table 4. Coefficients of determination R^2

Variables	R^2	*Strength*
Perceived Ease of Use	.754	Strong
Subjective Norms	.381	Strong
Perceived Behavioral Control	.316	Strong
Expectation Confirmation	.496	Strong
Satisfaction	.461	Strong
Attitude	.415	Strong

Hypotheses testing. Finally, the researchers perform the hypotheses Testing, including testing the relationships proposed in the structural model [74]. For the relevant purpose, the researchers first examined the direct relationships and, in the second phase, conducted the mediation analysis to examine the indirect effects of the mediating variables. Thus, the researchers examined the impact of Perceived Ease of Use on Perceived Behavioral Control. Analysis revealed a significant relationship between the proposed variables with the path value at .538 and p-value at p> 0.000.

Besides, the relationship proposed between Perceived Ese of Use and Subjective Norms also remained significant, with the path value at -.118 and p> 0.038. Besides, the relationship between Subjective Norms and Perceived Behavioral Control further remained significant, with the path value at .224 and p-value at p> 0.000. However, the impact of Perceived Behavioral Control on the Expectation Confirmation remained insignificant, with the path value at .003 and p-value at p> 0.814. On the other hand, the proposed impact of Expectation Confirmation on the Intention to Use Siri remained significant, with the path value at .150 and p-value at p> .006.

Finally, the researchers conducted a mediation analysis to examine the impact of Satisfaction and Attitude on the Expectation Confirmation leading to the Intention to Use Siri. First, the mediating role of Satisfaction remained significant, with the path value at -.128 and significance value at 0.022 (Indirect Effects=0.005). However, the Mediating role of Attitude remained insignificant with the path value at -.051and p-value at p> 0.108 (Indirect Effects= 0.015). Table 5 and Figure 3 summarize the findings of hypotheses Testing:

Table 5. Hypotheses testing (Regression weights)

S/R	Hypotheses	Path	t-value	Sign
H1	P.E.U.> P.B.C.	.538	10.929	.000***
H2	P.E.U.> S.N.M.	-.118	-2.076	.038**
H3	SNM>PBC	.224	3.727	.000***
H4	PBC> EPC	.003	.235	.814
H5	EPC>SIRI	.150	2.725	.006**
S/R	Hypotheses	Path	Indirect Effects	Sign
H6a	E.P.C.> S.F.S.> S.I.R.I.	-.128	.005	.022*
H6b	EPC>ATD>SIRI	-.051	.015	0.108

5.5 Importance of performance map analysis

Importance Performance Map Analysis (IPMA) helps to determine the performance of endogenous variables concerning their relation to the exogenous variable(s) [75]. Hence, Importance Performance Map Analysis (IPMA) in the current research involved *n*= 6 variables, including Perceived Ease of Use, Subjective Norms, Perceived Behavior Control, Expectation Confirmation, Satisfaction, and Attitude. Findings indicated that Perceived Behavioral Control scored highest (*M:3.95*). Followed by Attitude (*M: 3.92*), Perceived Ease of Use remained the third-highest variable (*M: 3.909*). Expectation Confirmation scored fourth highest (*M; 3.902*). Meanwhile, Subjective Norms (*M: 3.89*) and Satisfaction (*M: 3.84*) remained the lowest-scoring variables. Figure 3 illustrates the findings of the Importance Performance Map Analysis.
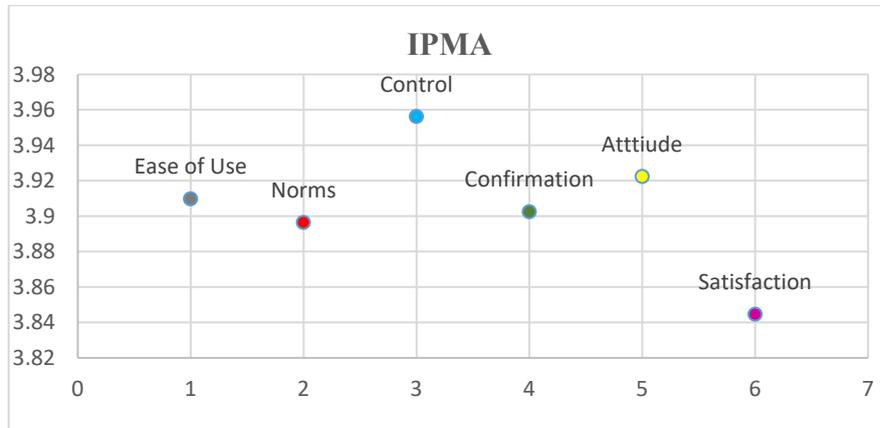
Fig. 3. Importance of performance map analysis

5.6 Artificial Neural Network Analysis

Current research also involves Artificial Neural Network Analysis (ANN) as an important approach to examining how the human brain tends to function [76]. Also, the relevant analysis helps examine the accuracy of results [77] as also applied by [78]. Hence, with the Training sample value at 175 and Testing sample value at 76, Artificial Neural Network Analysis revealed the Sum of Square Error value at 447.724 and Average Overall Relative Error value at .858, indicating an accuracy level of 14.2 (Training). While concerning Testing, the Sum of Square Error value at 189.743, and the Average Overall Relative Error value at .682, indicating an accuracy level of .30.8%. Figure 4 illustrates the findings of the Artificial Neural Network Analysis.
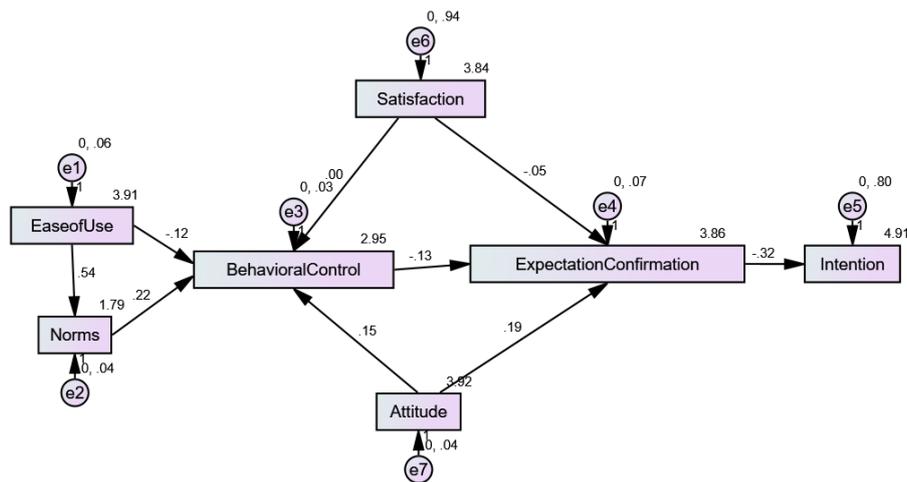
Fig. 4. Path diagram of the structural model

6   Discussion on results

Apple Inc. pays special consideration to provide their customers with maximum technological support and facility through their devices. For this purpose, their products, particularly smartphones, contain voice assistants designed and installed for relevant purposes. According to [79], these digital assistants rely on customers' data to provide supportive services anytime they want. These voice assistants constantly improve and personalize their services as a primary requirement to serve their users. However, here [80]questions why users intend to adopt these products? Or, in other words, the potential reasons that result in selecting the mobile devices that contain voice assistants [81]. According to [82], the Theory of Reason Action provides a potential justification for the factors that accelerate technology usage and adoption in the current era. According to the relevant theory, factors such as one's perceptions, Attitude, Intention, and behavioral patterns well describe technology preference. As noted by [83], several theories help investigate and affirm old technology usage. Yet, the Theory of Reasoned Action is distinguished as it mainly focuses on the cognitive factors.

Thus, the current research examined the factors responsible for the broader adoption of iPhone adoption and Siri usage as a personal voice assistant. Finings revealed potential consistency with the existing literature as the relationships proposed in the structural model mainly remained validated. First, the conceptual model proposed a significant impact of Perceived Ease of Use on the Perceived Behavioral Control (H1). The assumed impact remained significant with the p-value at $p > 0.000$, indicating g a stronger consistency with the study conducted by [26]. They found mobile computing primarily due to its easy usage facility leading to positive behavior towards its adoption. Further, H2 of the study proposed a significant impact of Perceived Ease of Use on the Subjective Norms. Results remained significant and consistent with the existing literature [30], [31], [33]. As [29] argued, ease of use and subjective norm anticipate technology adoption. For example, a group of individuals with smartphones will likely affect the other people intending to buy the smartphones for their usage [84].

Similarly, H3 of the study proposed a significant impact of Subjective Norms on Perceived Behavioral Control. Results revealed that observing others use Siri significantly impacted the respondent's adoption behavior, leading them to prefer Siri as their virtual assistant in cyberspace. These results indicated compatibility with the study conducted by [37]. They also found popular opinion and behavioral patterns inspiring the respondents to prefer Siri to other virtual assistants. Further, in the H4 of the study, the researchers hypothesized a significant impact of Perceived Behavioral Control on the Expectation Confirmation of the Siri users [85]. However, this impact remained insignificant, indicating inconsistency with the existing literature [44], [47]. On the other hand, the impact of Expectation Confirmation to Use Siri remained significant, with the p-value at $p > 0.000$. These findings remained consistent with the study [52], indicating that voice assistants provide the users with ease of use and ensure useful outcomes that positively influence their intention to use Siri in the future as well. Finally, the mediation analysis of the Satisfaction and Attitude on Expectation Confirmation leading to Intention to Use Siri was conducted. Even though the mediation of Attitude remained insignificant, the researchers found Satisfaction

significantly mediating the relevant relationship with the value of the indirect effect at 0.0005. This mediation effect remained consistent with the proposition [59] as they considered users' satisfaction an essential determinant of their intentions to start and continue technology adoption and usage [86].

Therefore, Siri is one of the most preferred voice assistants today. Despite other companies such as Amazon, Samsun, and others providing similar services, Apple Inc. stands as one of the most preferred ones. Accompanied by the ease of use, from basic to complex level services, Siri provides support to its users, indicating the growing importance of voice assistants in the mobile computing arena [87]–[91].

6.1 Conclusion

This study scrutinized the factors behind voice assistant usage among iPhone users under the Theory of Reasoned Action. Results revealed the factors proposed by the Theory of Reasoned Action significantly work as causing intention to use the relevant voice assistant. Today Emirati public widely prefers using smartphones in their daily life necessitates. Their ability and features are the main reasons behind their increased usage. As shown in the current research, iPhones have gained much popularity in the U.A.E. Enabling the iPhone with voice assistants such as Siri remains prominent, offering several services. Notably, the relevant devices accompanied by ease of use are preferred due to their distinguished services. In this regard, highlighting the use of voice assistant also reflect the importance of technology in our daily life. Especially mobile computing is playing a significant role in improving our everyday technology experiences.

6.2 Recommendations and limitations

As the current article focuses on mobile computing, the researchers also recommend more studies in the future. Especially, preferring other voice assistants and the other potential factors attributed to their adoption can further highlight the human-computer interaction. However, this study also contains some fundamental limitations. First, the researchers only adopted Siri by Apple Inc., while other popular voice assistants are equally popular among mobile users. Second, the researchers adopted a convenient sampling method as the aim is to select individuals having iPhones. Finally, the third limitation involves the generalizability of the result. The study is conducted in the United Arab Emirates, so the findings can only be applied to Emirati mobile phone users.

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