

# The impact of diffusion of innovation model on user behavioral intention in adopting social media marketing

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(Communicated by Ehsan Kozegar)

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## Abstract

Social media has become a new orientation and attitude for businesses today. Tools and methods for communicating with the customers have changed enormously with the revelation of social media and it has become a channel and an instrument that marketers can extend their marketing campaigns to a wider range of consumers. The research purpose of this article is to analyze the impact of diffusion of innovation model on behavioral intention in adopting social media marketing with the moderator role of subjective norms in Iranian users. By making use of an online exploration, this study gathers data from 253 experienced social-media users in Iran. We have utilized partial least squares structural equation modeling to examine the links between items of diffusion of innovation model, social media marketing adoption, behavioral intention and subjective norms. The results revealed that diffusion of innovation influence was found as a nominative determinant of users' behavioral intention to adopting social media marketing while behavioral intentions were also found to have positive significant association towards users' behavioral intention to adopt social media marketing. In addition, the results of the empirical study showed that subjective norms moderated the relation between diffusion of innovation and customer behavioral intention.

*Keywords:* Behavioral intention, Adopting social media marketing, Diffusion of innovation model, Subjective norms

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## 1. Introduction

During different eras, different methods of communication have developed and changed day by day in people's lives [72]. Social media usage has become many people's routine activity and has affected

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Received: March 2021 Accepted: June 2021

“ communication patterns around the globe, as well as the way people gain and share information” [61]. The social media transformation has likewise triggered innovative spirits, and we can see that there are a lot of organizations being started on social media [76]. In today’s technology driven world, social media has become an avenue where retailers can extend their marketing campaigns to a wider range of consumers [58]. So, it is vital to understand the dynamic pattern of social media and its influences on users and the relationship between them [97]. The communication distance has been reduced by using social media in the world and the advent of social media has provided opportunities for businesses to enhance their exposure [55]. To summarize all the definitions, social media is to assist people to make connection whereby social networking boosts the connection [17]. Social media can also boost the performance and ability of organizations such as improving customer relations and customer service activities, and improving convenience in getting information [60]. Therefore, businesses must learn how to use social media in a way that is consistent with their business plans [52]. This is especially true for companies striving to gain a competitive advantage [58].

This study has used the theory of reasoned action model and the theory of planned behavior combined with a diffusion of innovation theory (DoI), a theory to analyze the effects of intentional behavior on selection of social media marketing (SMM) [20]. The DoI has been widely used to investigate factors that influence an individual’s decision to adopt an innovation or a new technology. The DoI model suggests that individuals would only choose to adopt a technology if it presents five characteristics: relative advantage (RA), compatibility (CO), complexity (COM), observability (OB), and trial ability (TR) [38]. Given that today the competitive pressure among industries has increased; therefore, competitive pressure may be influenced by some elements such as technological development, globalization and prompt scattering of new technology [21]. Porter and Millar (1985) proposed that to affect the industrial structure of the companies, it is useful to accept innovations. This vision, in turn, might alter the way in which competing operates in the industry and gives a competitive advantage to the organization that chooses to take it up. Porter and Miller’s analysis was oriented on acceptance of information systems. However, it is possible to be extended to social media, since new organizational strategies and react to competitors can be implemented from this technology. White, Kenly, and Poston (2016) investigated 90 manufacturing and service companies and discovered that companies which are using social media for the purpose of product innovation have announced business benefits from doing so. Less time to market, lower costs for products and product development, more creative production ideas and increased product adoption were some of these benefits. Increased market share and higher revenues were, in turn, the outcomes of these improvements for the companies [1].

On the other hand, SMM is an integral element of 21<sup>st</sup> century business world [25]. The proliferation of social media created a whole new era for companies and marketing, forcing them to seek new interactive ways of reaching and engaging their customers [31, 45]. Understanding the role of social media in the context of marketing is critical for both researchers and managers [24, 46, 83, 96]. Most existing studies focus on particular issues, such as brand [23, 31, 44], innovation management [54, 56, 57] and customer relationship management [5, 89]. Although social media provides new opportunities and benefits for marketing [41], one of the persistent challenges—despite growing scholarly interest—is the difficulty with measuring the impact of customer behavioral intention (BI) activities on SMM [31, 74]. This deficiency is surprising because both academics Yadav and Pavlou (2014) and practitioners acknowledge new complexities accompanying these media and agree that research into SMM needs to be re-conceptualized [25]. Nevertheless, it is noticed that although new technology has dozens of advantages, sometimes users are unwilling to accept and use that technology. Keeping this information in mind, analyzing the elements affecting users’ intention for accepting and using social media has been the greatest concern of the researcher [82]. Because there is insufficient empirical

research on social media, it is essential to determine whether BI directly explains SMM or not and to further examine associated factors. This is an empirical research to test the significant factors that have an effect on the users' intention for accepting and using SMM. In addition, clarifying the relationship between social media usage with BI and identifying associated factors will subsequently help using social media. To provide new insights on this problem that has not been sufficiently examined by previous studies, this study sets the following four objectives: 1) to consider the components of DoI model, 2) to examine the relationship between SMM and BI, 3) to consider variables that affect BI to enable formulation of more specific measures, and 4) measure the relationships between SMM, BI and DoI model with moderator variable subjective norms.

The rest of this paper includes the hypothesis development is described in section 2. Section 3 is methodology. Analyses and results are mention in section 4. Finally, the study conclusion and discussions have been introduced in section 5. Sections 6-7 describe the management recommendations and contribution, limitations and future research.

## 2. Hypothesis development

Dynamics of the market has been changed by advent of recently developed information and correspondence technologies, specially the Internet and social networks [93]. This has led to threatening the competitive orientation of companies and enhancing customers' power [84, 96]. Customer consumption habits have been changed by the Internet and online-based social media which has been achieved by presenting new visions of looking for, assessing, selecting, and purchasing goods and services for the customers [7]. The dramatic rise of social media has opened up new possibilities for marketers to connect with their customers [48]. Using social media has become available everywhere, and it is vital for the organizations to manage this recently presented tool to achieve their strategic goals [90]. Reaching customers, interacting with them and grasping their opinions for a major impact are some of the advantages of social media which are facilitated by a dynamic space [37]. As organizations are increasing their investment in SMM, evaluation of such techniques is becoming increasingly important [42]. Consumers are using social media to generate information and share their experiences with their friends, companies, and broader online communities via posts, tweets, shares, likes, and reviews [40]. Furthermore, Internet is connected to the social and economic successfulness of the societies [6]. In the context of business, this means that customers are more engaged to the social media and marketers should monitor and respond to the consumers through the social media [77]. Expected benefits are the main reasons because of which businesses are anticipated to cope with new technologies [88]. These benefits are largely recognized rather than actual, and that is why they mostly depend on knowledge and comprehension within the organization [1].

In Table 1, some of the significant empirical findings regarding media needs are presented. These findings provide a baseline in developing several aspects of forming a concept for SMM adoption. According to the information presented here, and because of the substantial participatory characteristics of social media that is presented in the online platform, it can be asserted that some of these needs are related to the available context, and, therefore, they will be used in expanding our research model. In the focus group discussion, these needs were examined to analyze whether they represent an essential variable to illustrate SMM adoption or not.

Thus, the following hypotheses are proposed within the context of factors affecting on SMM based on the previous literature.

### 2.1. DoI model

In order to define the process of SMM adoption, it is important to analyze the adoption concept [61]. To respond a query of how an SMM adoption happens, it is crucial to turn to the existing

Table 1: Relationships between DoI model and other constructs analyzed in previous studies

Authors	Proposed relationships	Supported	Not supported
Lewis (2013)	Subjective norms → BI	*	
Han (2016)	BI → Adoption SMM	*	
Noreen and Han (2016)	BI → Adoption SMM	*	
Ahmad et al. (2019), Moore and Benbasat (1991), Everett M Rogers (2003), Van Ittersum and Feinberg (2010)	DoI model → Social media Adoption	*	
Sigo (2019)	BI → Adoption SMM	*	
Sun and Wang (2019)	BI → SMM	*	
Dalila, Latif, Jaafar, Aziz, and Afthanorhan (2020)	BI → Adoption SMM	*	
Yusliza, Saputra, Fawehinmi, Mat, and Mohamed (2020), Sigo (2019)	Subjective norms → BI	*	
Anastasia and Santoso (2020)	Subjective norms → BI	*	

theories about diffusion that are presented and these theories clarify and predict the way in which technology is adopted by diverse channel. Everett M Rogers (2010) has developed one of the better-known theoretical approaches to diffusion of innovation. This theoretical framework is helpful when determining the adoption of specific clinical behaviors and when deciding which components will require additional effort if diffusion occurs [70]. The characteristics of an innovation, as perceived by the members of a social system, determine its rate of adoption. Five attributes of innovations are: (1) RA, (2) CO, (3) COM, (4) TR, and (5) OB [22]. Table 2 shows the definition and applications of the respective dimensions.

Avery et al. (2010) have examined the dimensions of adopting social media in public health agencies and adoption mediators based on DoI theory. Their findings regarding social media tools represent less overall adoption rates. Nevertheless, according to the size of the communities, major differences were observed for adoption in which urban societies showed the highest adoption rates, followed by suburban areas, large towns and rural communities. The most frequently reported barrier that the practitioners named for not getting benefit from health information presented online was lack of access to the Internet at home. Among 17 percent of practitioners who have represented they were using social media to distribute health information, the most widely used tools were social networking sites, the new media release, blogs, and discussion boards. Rural areas reported the highest use of podcasting although they had the lowest social media use in general.

Peslak, Ceccucci, and Sendall (2010) have studied social networking behavior using E. Rogers (1995) model of human behavior known as DoI. Specifically, findings revealed that behavioral CO

Table 2: Core perceived attributes of innovations (Atkinson, 2007)

<b>Attribute</b>	<b>Definition</b>	<b>Application</b>
<b>Adjacent Advantage</b>	The degree of perceiving an innovation as an item better than the idea it displaces.	Its advantages might be related to economic, social status, or other factors. Innovations that seem to be beneficial when contrasted to other current and previous methods are more probable to be accepted.
<b>Compatibility</b>	The degree of perceiving an innovation as consistent with the requirements of potential adopters, available values and past experiences.	When the innovation is correlated to the economic, sociocultural and Philosophical value system of the adopter and the adopter's expectancies and needs, adoption is probable. "Positioning" techniques are matched with the needs and worthiness of potential adopters with the creativity to facilitate its introduction.
<b>Complexity</b>	The degree of perceiving an innovation as an item which is almost tough to understand and use.	Complex innovations are less probable to be accepted. The only attribute, which is negatively relevant to adoption, is COM. Some researchers use the word simplicity so that the qualifications would be in the same direction in correspondence of their correlation with adoption.
<b>Trialability</b>	The degree of experimenting has an innovation on a limited basis.	Innovations that are experimented before adoption are accepted faster than those that are not, particularly among those who accept sooner in comparison to the high number of potential adopters. Those who adopt later use the experiences of their friends as an indirect trial of the innovation
<b>Observability</b>	The degree of visibility of the outcomes of an innovation to others.	When somebody sees a friend using a special innovation, such as a cellular phone, that person models the way in which the innovation works besides the benefits of using it. It is less probable that that person is observing the outcomes of an innovative idea. Therefore, innovative ideas are more adopted than innovative products.

with social networking, RA, COM and ease of trying are positively associated with intention to use social networking. In addition, findings confirmed that intention influences use of social networking. A review of gender shows little difference between diffusion influences on intention. The modified

DoI model provides a good fit with the overall data and can be used to predict and understand the usage of social networking. Based on this background, we hypothesize that:

**H1:** DoI model has a positive effect on BI.

## 2.2. BI

Behavior is classified by a person's intention to behave while the intention is affected by the performance of the behavior, subjective norms and perceived behavioral control [28]. According to [4], BI can be referred as the indication of individual readiness to conduct the given behavior. Lin (2007) remarked behavior intention has been used to conduct a broad variety of research predictions involving behavior in a virtual community. As a general rule, the stronger the intention to engage in a behavior, the more likely should its performance be [43]. Angella Jiyoung Kim and Ko (2010) have investigated the effects of this SMM on customer relationships (involving intimacy and trust) and purchase intention. It is presented in the results that distinctive elements are in the chosen brand's SMM compared to out-of-date marketing performances. Customer relationships and purchase intentions are positively related to every property found in luxury brands' SMM, in which entertainment affects more changes than any other elements. Luxury brands are obliged to supply an entertainment aspect of social media contents and activities in a large scale. In this case, every activity enabled by the use of the media should all be entertaining, such as providing customized service and free entertainment contents, making relationships with other users, and getting intelligent information on personal interest. Customer relationships and the real intentions to buy the stuff will be enhanced by focusing on representing features like these. Trust and purchase intention were vastly related considering the relation between the customer relationship and purchase intention. Interaction with other users increases the customers' trust just like a brand on social media sites. Trust that is gained by enjoying entertainment and communication that is provided on the sites seems to have a great correlation with the profit of a luxury brand.

Balakrishnan, Dahnil, and Yi (2014) have attempted to study the impact of SMM medium towards brand loyalty and purchase intention in Generation Y. The results indicated that the online marketing communications, specifically, electronic word of mouth (E-WOM), online communities and online advertisement are effective in promoting brand loyalty and product purchase intention through company website and social media platforms. These findings indicate to marketing managers that SMM medium has become an important marketing tool to reach emerging younger generation of consumers. It also indicates that cyber world plays an important role in modern marketing, enabling marketers to reach customers faster and more efficiently.

Sano (2014) has studied how SMM activities work in tourism industry and how they can help travel agencies increase customer satisfaction and affect positive word-of-mouth as well as behavior intentions. The results show that SMM activities affects customer satisfaction stronger than behavior intention and positive word-of-mouth. Moreover, the results also show that customer satisfaction influences behavior intention stronger than positive word-of-mouth.

Han (2016) presented an empirical study to test the elements that influence the intentions of the users for the acceptance and use of SMM. SMM acceptance model is proposed in this study by combining unified theory of acceptance and use of technology (UTAUT) and technology acceptance model along with personal constructs. Since the focus of this study was on UTAUT, therefore, a high number of elements were chosen from this theory. The findings have shown that users' intention for acceptance of SMM is widely affected by online advertisement and eWOM. Furthermore, users' attitude towards advertisement is also influenced significantly by perceived risk, social influence, effort expectancy, facilitating conditions and perceived usefulness. It is obvious that attitude towards

eWOM is mostly affected by social influence, perceived usefulness and involvement. On integrated model, moderating effect of frequency use, nationality and gender are also examined.

Direct and indirect influences of activities available in SMM (WOM, entertainment, customization, interaction, and trend) are investigated by Gautam and Sharma (2017) on the intentions of consumers in purchasing luxury fashion brands. They found positive significant impacts of SMM and customer relationships on consumers' purchase intentions. In addition, their study model confirmed full mediation of customer relationships in the relationship between SMM and consumers' purchase intentions. Based on the research findings, they strongly recommend that marketers of luxury fashion brands engage in SMM activities to provide value to customers.

Sigo (2019) discovered the factors affecting the initial response of entrepreneurs in Ethiopia regarding behavioral intention when adopting SMM. To determine what can influence entrepreneurs' BI to adopt SMM, UTAUT was used as the theoretical framework to investigate the adoption level of SMM as a platform among Ethiopian entrepreneurs. The result showed that social influence was found as nominative determinant of entrepreneurs' BI to adopt SMM while facilitating conditions, effort expectancy and performance expectancy were also found to have positive significant associations towards entrepreneurs' behavioral intention to adopt social media marketing. Therefore, the hypothesis of the second study is as follows:

**H2:** There is a positive effect on acceptance of SMM in BI.

### *2.3. Adoption of SMM and subjective norms*

“Social media refers to the online platforms and tools that people use to share opinions and experiences including photos, videos, music, insights and perceptions with each other” [81]. Kaplan and Haenlein (2010) define social media as “a group of Internet based applications that build on the ideological and technological foundations of the Web 2.0 and allow the creation and exchange of user generated content.” Also, Chi (2011) defines SMM as a “connection between brands and consumers.” SMM utilizes podcasts, wikis, blogs, folksonomies, online videos, photo sharing, news sharing, message boards and posts on social networking sites to contact a large or targeted audience [25]. With the increased adoption and fission of the Internet, World Wide Web is becoming gradually a standard advertisement platform. The Web is offering business advertisement worldwide with more rich media tools, interactive services, and global reach [11]. Therefore, social media should be applied in the organizations and individuals must start using them in their businesses. On the other hand, it is essential to know how to use them or else these people and organizations will be out of the available market.

Likewise, social media has a significant importance in marketing and very little notable research has been done specifically on adoption procedure based on theories related to technology adoption. Pookulangara and Koesler (2011) have a conceptual paper which puts forward a research model by using Hofstede's cultural dimensions and Technology Acceptance Model. This paper examines the influences that the culture has on social networking and the influences that it has on purchase intention. Curtis et al. (2010) has used the unified theory of acceptance and use of technology (UTAUT) and it shows a positive relationship between UTAUT elements and its credibility, which shows that the probability of adopting social media in public departments is great. Sarosa (2012) has applied actor network theory in Indonesia SMEs to manifest the adoption of social media networks because it is able to illustrate the interactive process of adoption phenomenon among organizations and their environment rather than focusing on single elements that may affect the adoption.

Subjective norms are an individual's perceptions regarding the approval or disapproval of important others of a target behavior [26]. Also, [27] defined subjective norms as ‘the degree to which individuals perceive that most people who are important to them think they should or should not

use the system'. Subjective norms shape how individuals see themselves, impact self-efficacy beliefs, shape outcome expectations and in turn influence the likelihood of forming domain-specific intentions [71]. To illustrate technology adoption results, related theories of technology adoption are beneficial and the theories related to behavior concentrate on the individual analysis level in which the impacts of human behavior is significant. The Theory of reasoned action stated by I Ajzen (1991) announces that attitudes and subjective norms has an impact on behavioral intention. Research shows that external influences such as social norms or social influences affect user behavior [13]. User comments affect usefulness beliefs and preferences [84].

Sun and Wang (2019) have investigated consumers' attitudes towards and their intentions in social media towards buying green products and have explored the relationships among product knowledge, SMM, perceived consumer effectiveness, perceived behavioral control, price consciousness, subjective norms and attitudes. Furthermore, in their research, they attempted to understand these relationships further in a vast variety of consumer groups. The empirical results show that some factors such as attitude, subjective norms and perceived behavioral control have a positive effect on purchase intentions, so long as price consciousness has a negative effect on purchase intentions. Having knowledge about a product has positive effects on consumers' attitudes and purchase intentions, and perceived consumer effectiveness has positive effects on consumers' attitudes. It could be predicted that SMM has positive effects on subjective norms, the knowledge one has regarding products and perceived consumer effectiveness and negative effects on price consciousness. Nevertheless, there isn't any important correlation between perceived consumer effectiveness and purchase intentions. Based on the outcomes of multi-group structural equation modeling analysis, the effects have a significant difference among various consumer groups.

Therefore, the hypothesis of the final study is as follows:

**H3:** Subjective norms moderated the relationship between DoI model and BI.

Figure. 1 shows the proposed model for the adoption of SMM by user's social media. The subjective norms are as moderator variables. In line with the literature, we expect companies with more financial resources to be more likely to adopt new technologies [35] and younger marketing executives are more likely to be early adopters and to drive the adoption of social media within their organizations [75].

### 3. Methodology

#### 3.1. Sample and participants

The research was conducted in the Iranian users who have used social networks and have been influenced by SMM in 2020; to test the research model, we employed a survey method. Before starting the study, we needed to assess the validity and reliability of the questionnaire. To examine the consistency of the questionnaire, some questions were given to the study sample, which consisted of 50 social media users. Researchers can make use of such pilot studies in many ways, e.g. testing and assessing the feasibility of a survey [86]. A customer panel database is used to identify appropriate respondents in the study, represented by a marketing research organization in Iran. According to this database, an online survey hyperlink is selected and sent to 1,000 panel members who were registered in marketing company. In the questionnaire, every respondent who has used social networks that are not filtered in Iran (such as: Instagram, WhatsApp, LinkedIn and also, Telegram is the only social network in Iran that, despite being filtered, has a high usability in Iran) was permitted to fill out the instrument. Therefore, the respondent was assured with the represented social media in the current study. 500 Rial (approximately US\$ 2) was provided as an incentive for each participant to motivate them. On the whole, 284 questionnaires were received over a six-week period. Among them, 31 were



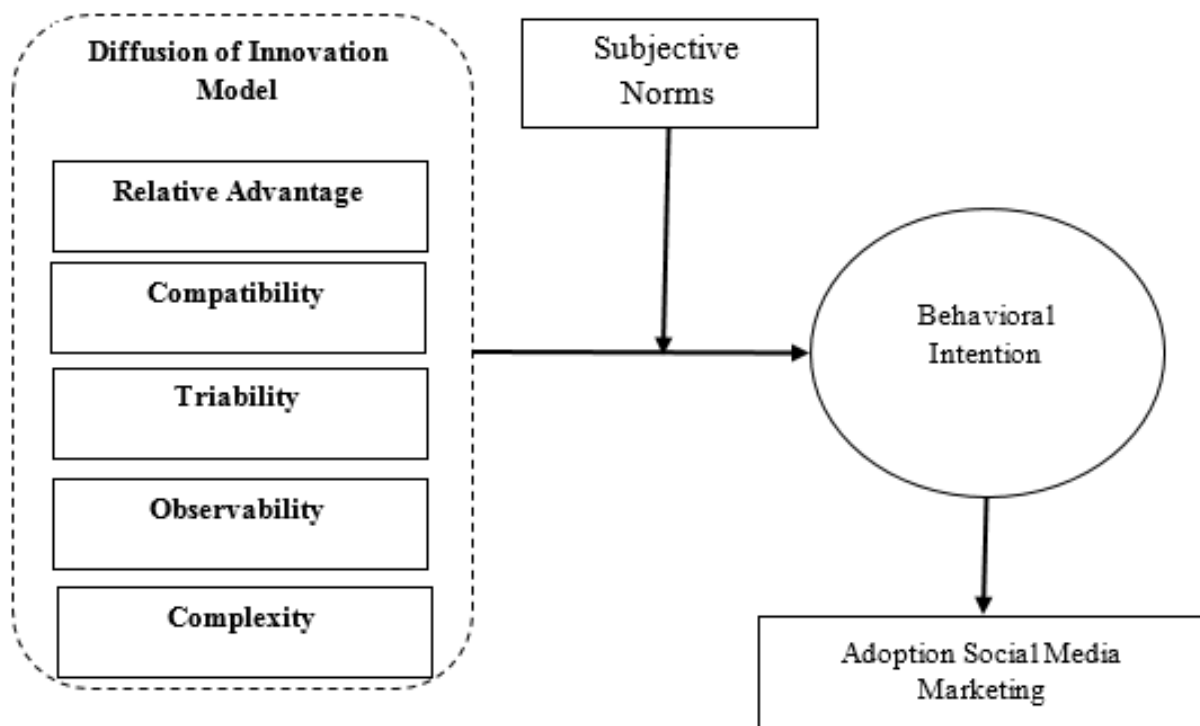


Figure 1: Proposed model structure

eliminated since all the scales were responded with the same value, resulting 253 valid responses in total (25.2% response rate). Table 3 shows the demographic information of the respondents.

Table 3: Frequency distribution for respondents.

Demographic information	Frequency	Acceptable percent	Cumulative percent
<b>Gender</b>			
Male	118	46.6	46.6
Female	135	53.4	100.0
<b>Age</b>			
20-25	21	8.3	8.3
26-35	125	49.4	57.7
36-45	73	28.9	86.6
46-55	24	9.5	96.0
>55	10	4.0	100.0
<b>Education</b>			
Diploma	44	17.4	17.54
AA	30	11.9	29.2
BA	113	44.7	73.9
MA	56	22.1	96.0
PhD	10	4.0	100.0
Total	253	100.0	

As it is also visible in Table 3, among 253 respondents, 118 are males (46.6%) and 135 are

females (53.4%). Similarly, the highest frequency belongs to age group (26-35) with frequency of 125 respondents. One of the other characteristics of samples in this study is education degree for participants. BA degree has the highest frequency; and one of the characteristics of samples in this study is using social media between Iranian users for which the related pie chart is shown as follows:

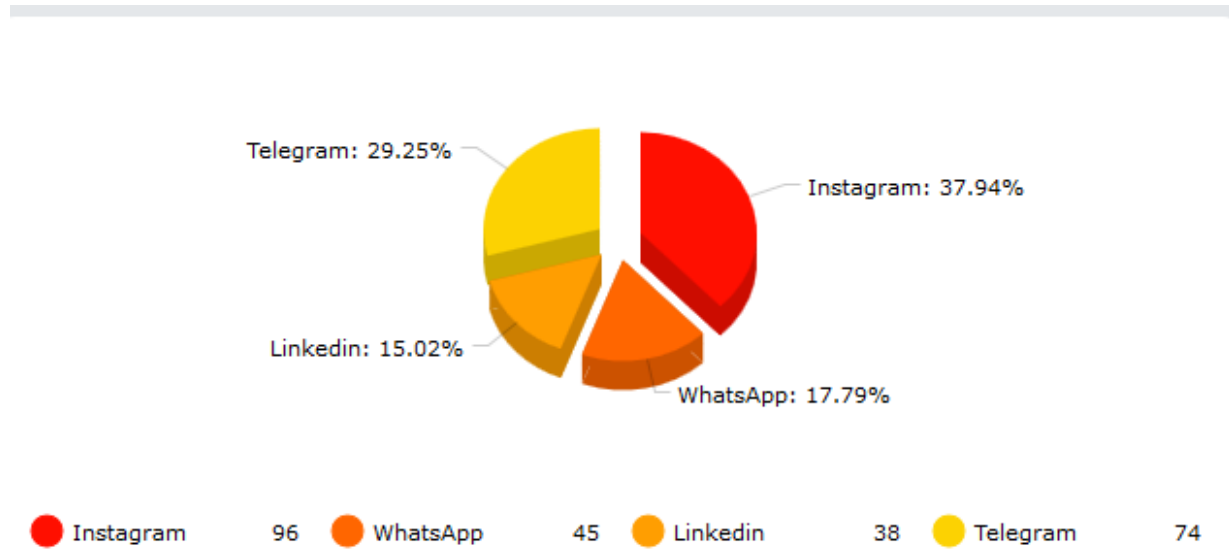


Figure 2: Use of social media in Iran

### 3.2. Measurement items

All of the measurement items were extracted from prior related studies. Some items were modified slightly to suit better in the SMM context. A five-point Likert scale, anchoring from “strongly disagree” to “strongly agree,” was utilized to gauge the items in this study. All the measurement items and their sources in the questionnaire are represented in Table 4. Distinctively, DoI Model is measured by using a ten-item scale where RA dimension is adapted from [12] with 2 items, CO is adapted from [12] with 2 items, TR is adapted from [80] with 2 items, OB is adapted from [80] with 2 item and COM is adapted from [80] with 2 item. Subjective norms are calculated by eight items adapted from [92]. BI users are calculated by a five-item scale [76, 87]. Finally, adoption of SMM is calculated by five items adapted from [78] (Table 4). Furthermore, the loading of the items should be more than 0.4 [39]. It can be understood from Table 4 that the loading items range between 0.61 and 0.93.

Table 4: Items used in Questionnaire.

Constructs	Items	Descriptions	Factor Loading	Sources	
<b>DoI Model</b>					
1. Relative Advantage	RA1	I find SMM useful.	0.701	[12]	
	RA2	I think SMM provides a valuable service for me	0.644		
2. Compatibility	CO1	SMM fits into my lifestyle.	0.622		
	CO2	Using SMM is completely compatible with my current situation.	0.800		
3. Triability	TR1	I was able to properly try it out before I used social media applications	0.884		[80]
	TR2	The cost of trying social media for a business purpose is relatively low compared to other platforms	0.862		
4. Observability	OB1	I have no difficulty telling others about the results of using social media applications	0.809		
	OB2	I believe I could communicate to others the consequences of using social media applications	0.781		
5. Complexity	COM1	It is easy to get social media to do what I want it to do	0.641		
	COM2	It is easy to become skillful at using social media for business purposes.	0.662		
Subjective Norms	SN1	When buying products, I generally purchase those brands that I think others will approve of.	0.747	[49]	
	SN2	If other people can see me using a product, I often purchase the brand they expect me to buy.	0.715		
	SN3	I achieve a sense of belonging by purchasing the same products and brands that others purchase	0.822		
	SN4	I think that I frequently communicate with people through social media.	0.700	[47]	
	SN5	I believe that it is fair and obligatory to help others when I engage in social media activities because I know that other people will help me some day.	0.809		
	SN6	I believe that other people will help me when I need help if I share knowledge with others through social media.	0.873		
	SN7	I believe that other people will answer my questions regarding specific information and knowledge in the future if I share knowledge with others through social media.	0.830		
	SN8	I think that people who are involved with social media develop reciprocal beliefs on give and take based on other people's intentions and behavior	0.778		

Users BI	SBI1	Using online social media increases the effective use of time in managing my tasks.	0.893	[76, 87]
	CBI2	People who influence my behavior think that I should use online social media	0.712	
	CBI3	I plan to use online social media on my business more frequently.	0.859	
	CBI4	Using the online social media would enable me to accomplish tasks more quickly.	0.872	
	CBI5	Using online social media increases the quality of my output at minimal effort.	0.745	
Adoption SMM	ASMM1	I am using social media as a marketing tool for my practice.	0.800	[78]
	ASMM2	I do not use social media as a marketing tool yet but plan to implement it.	0.691	
	ASMM3	I do not use social media as a marketing tool and have no plans to .implement it.	0.642	
	ASMM4	I do not use SMM due to a lack of knowledge on SMM; I need more information and I am not sure right now.	0.808	
	ASMM5	I do not use SMM due to security concerns.	0.865	

#### 4. Analyses and results

To reach the target and examine the research hypotheses, we used Smart- PLS 3.3.2 software. We considered two necessary methodological items of the Measurement and the Structural Model, where the hypothetical and statistical properties of the conceptual frame were identified. At the moment, scholars make use of PLS-SEM technique in a wide range, in different research areas such as management disciplines, marketing and statistics [32, 33]. Basic reason for using PLS software is the potential of this approach in employing combined measurement model also another the potential for supporting from moderating variable is the other reason in using this software.

##### 4.1. Measurement model assessment

We have made use of the measurement models to evaluate the correlation between each latent variable and the indicators related to it, where the target is to assess the validity of the variables, reliability and internal consistency. Table 5 shows the measurement models' outcomes of reflective constructs for each and every dependent and independent variables. We measured three main outputs to identify items loading, the convergent validity; through Average Variance Extracted (AVE) and internal consistency, Composite Reliability (CR) of the three measurements or constructs. The CR should be greater than 0.708 (acceptable range is 0.60 to 0.70) [34]. Finally, the AVE should be greater than 0.50 to verify the utilization of the factor [29].

It can be concluded from Table 6 that the CR for all constructs was more than 0.86. Therefore, the CR and Cronbach's alpha have shown reasonably reliable scales. The values for AVE were greater than 0.5 for all constructs so convergent accuracy was verified. Beneficial internal consistency and the convergent validity of the measurement model were confirmed here.

Discriminant validity have been necessary as well to examine the dissimilarity among measurement tools of various items, where the square root of AVE must be greater than other constructs'

Table 5: Results of convergent validity for the measurement model (acceptable threshold values in brackets).

Construct Items	Mean (SD)	Cronbach's a (>0.70)	Rho_A (>0.70)	Composite Reliability (>0.70)	Average Variance Extracted (>0.50)
Adoption SMM		0.823	0.848	0.875	0.586
Users BI		0.875	0.884	0.910	0.672
DoI		0.909	0.920	0.925	0.557

correlations [29]. In Table 6, the results of applied Fornell-Larcker criterion are presented where our model verifies this criterion. Based on provided criterion, the proposed model is acceptable in standard level. Table 6 is related to a proposed model, which shows acceptable divergent validity because the values in the main diameter are higher than it is underneath numbers.

Table 6: Discriminant validity for the measurement model (values in bold: the square root of the average variance extracted for each construct).

Construct Items	Adoption SMM	Users BI	DoI
Adoption SMM	<b>0.766</b>		
Users BI	0.661	<b>0.819</b>	
DoI	0.525	0.521	<b>0.746</b>

Matrix shown in Table 6 is divergent validity of the proposed model so that given the greater sum of listed numbers in the main diameter than their following numbers it shows divergent validity at acceptable level. HTMT criterion denotes ratio of geometrical mean for correlations of parameters in the same construct to average of correlations of parameters. HTMT criterion has clearly better performance than classic approaches for evaluation of differential validity e.g. Fornell-Larcker criterion which is not capable of diagnosing lack of differential validity. If HTMT value is less than 0.90, the differential validity has been confirmed between reflective constructs.

Table 7: Results of discriminant validity by HTMT.

Variables	Adoption SMM	Users BI	DoI
Adoption SMM			
Users BI	0.847		
DoI	0.778	0.708	

As it is seen in output of this criterion, this value is under 0.9 for all constructs of standard model and therefore, it is approved. Thus, Tables 5 -7 indicate that all achieved results are acceptable because all the criteria are in the standard level.

#### 4.2. Assessment of the structural model

The structural model or internal model shows relationship between hidden variables. The structural model estimates hidden variables using single or multiple regressions between hidden variables which are approximated according to measurement model.

**Variance Inflation Factor:** The first criterion is collinear analysis that is designated for structural constructs. In this case collinearity should be evaluated between predictor constructs. Collinear analysis is done based on Variance Inflation Factor (VIF), criterion and that value should be lower than 5 [34]. If the maximum value of VIF criterion is higher, then constructs should be deleted and

merged and second and higher order constructs should be built. The VIF factor of each and every item was less than five, showing that multi-collinearity criterion was acceptable. Table 8 shows the results obtained for the index VIF.

Table 8: Collinearity Statistics (VIF)

Variables	Adoption SMM	Users BI	DoI
Adoption SMM			
Users BI	1.000		
DoI		1.000	

**Determination coefficient ( $R^2$ ):** The coefficient of determination is the critical criterion for assessing endogenous variables of a path model. This index shows that what percentage of endogenous variable change is done by an exogenous variable.  $R^2$  is a criterion used for linking the measurement part to the structural part of structural equation modeling. Chin (1998), introduces three values like 0.67, 0.33, and 0.19, for strong, medium, and weak, and  $R^2$  values.  $R^2$  is used to evaluate model ability.  $R^2$  value is confirmed for dependent variable of SMM adoption (0.924), and the BI users (0.673) at strong levels in this model.

**f Square:** Third criterion is f Square. Cohen (1992) has evaluated weak, medium and strong values respectively with 0.02, 0.15 and 0.35. The results of f Square in table 9 will be displayed for all independent constructs over dependent constructs.

Table 9: f- Square

Variables	Adoption SMM	Users BI	DoI
Adoption SMM			
Users BI	1.000		
DoI		1.000	

#### 4.3. Assessment of the general model

Recently, a global fit measure for PLS path modeling has been suggested, GOF ( $0 < GOF < 1$ ), defined as the geometric means of average communality and average  $R^2$ .  $GOF_{small} = 0.1$ ,  $GOF_{medium} = 0.25$ , and  $GOF_{large} = 0.36$ ; These may serve as baseline values for validating the PLS model globally [91]. The GOF index was calculated by this formula:

$$GOF = \sqrt{AVE \times \overline{R^2}} \quad (1)$$

$$GOF = \sqrt{0.605 \times 0.798} = 0.695$$

By substitution of related values, GOF value is derived 0.695 that is greater than given value (0.36). Compared to the above defined basic values for GOF, this value indicates that structure of the model is appropriate. Therefore, general model is surely confirmed at a strong level.

#### 4.4. Results of analysis on hypotheses

**Path coefficient:** Path coefficient means standardized beta in linear regression. If the achieved beta value is considered above the least statistics in the desired confidence level, then that relation or hypothesis will be proved. In the significant level, 95, 99, and 99.9 percent of this value are compared with least T statistics 1.96, 2.57 and 3.27, respectively [32]. Significance, hypotheses prove

and powerful influence of each independent variable on the dependent variable can be accepted from the achieved values through analyses for path coefficient and  $R^2$ . Figure 2 and 3 shows the results.

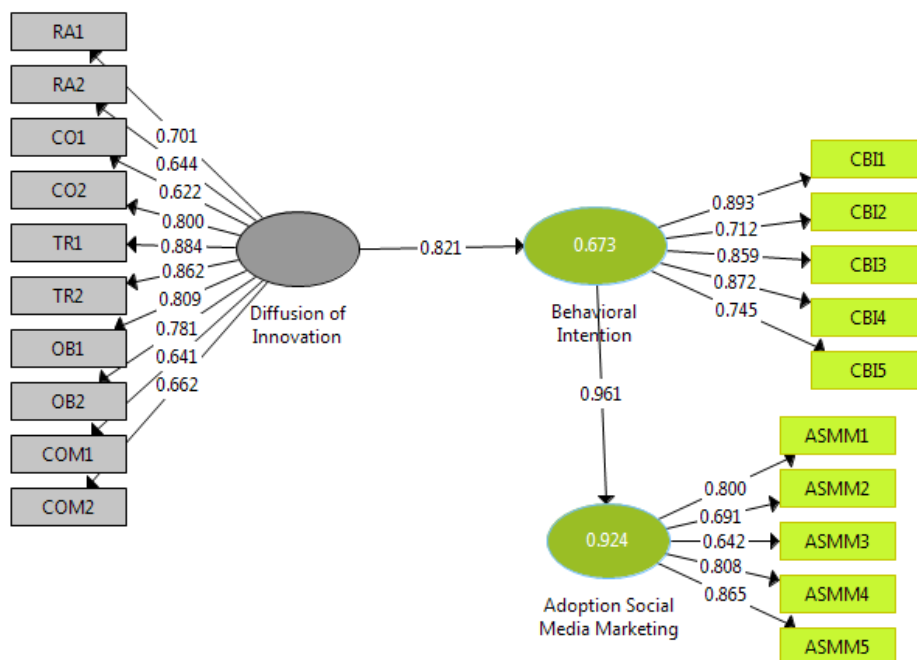


Figure 3: Path coefficients and  $R^2$ -value without mediator variable

T-significant coefficients: Significant T-numbers are the most primitive criteria to measure the relation between constructs in the model (structural parts). If these values are greater than 1.96, 2.58 and 3.27, this indicates accuracy of relationship among constructs and as a result, research hypotheses are confirmed at levels of confidence (99%, 99.9% and 95%). To test whether these dimensions of DoI affect BI Users directly and SMM adoption indirectly or not and to test the given hypotheses, this point was examined by means of significance T-coefficient test. The results of T-tests are shown in Figs 5 and 6. The given results indicate that hypotheses are acceptable at significance levels of 95% and 99.9%.

As it is characterized in fig 6, significance coefficient for moderator variable of subjective norms is 2.025 that is greater than designated value 1.96. In other words, it can be confirmed at confidence level 95% that subjective norms moderates relationship among DoI and BI Users.

#### 4.5. Analysis and interpretation of results

For the first hypothesis, T-value shows 13.230 between DoI dimensions and BI Users where DoI dimensions have positive and significant impact on BI Users at confidence level of 99.9%. Secondly, T-value shows 137.654 between BI Users and SMM adoption and this indicates that BI Users have positive and significant impact on SMM adoption at confidence level of 99.9%. Based on third hypothesis, the results indicate that subjective norms may moderate relationship of DoI and BI Users with T-value (2.025) at significance level of 95%. Likewise, with respect to probability statistic (p), all hypotheses are at acceptable level of confidence. The results of T-test and path coefficients are given in Table 10.

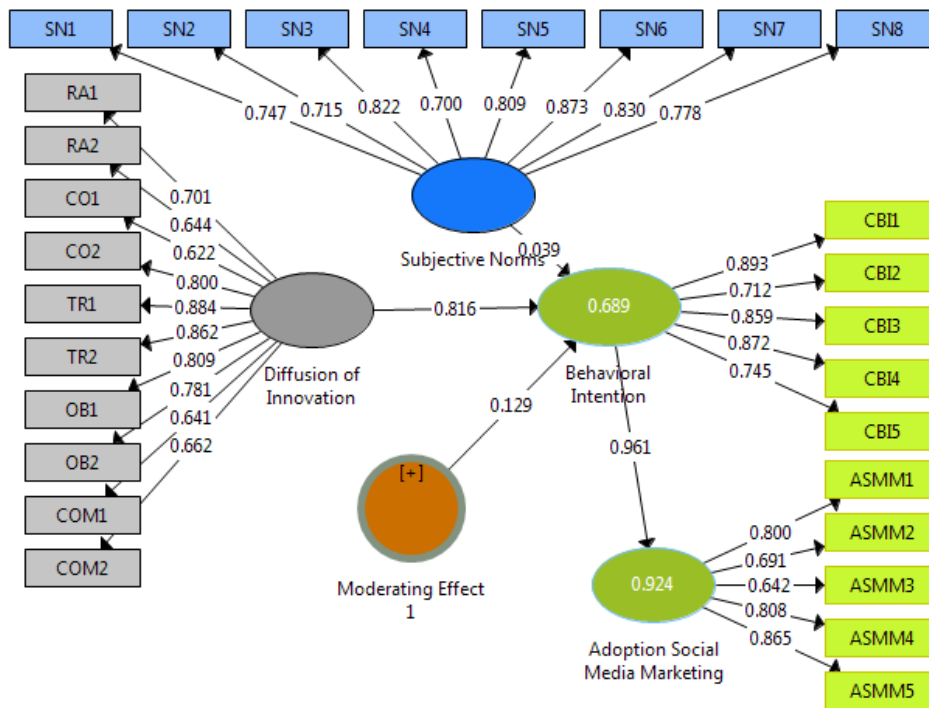


Figure 4: Path coefficients and  $R^2$ -value with mediator variable

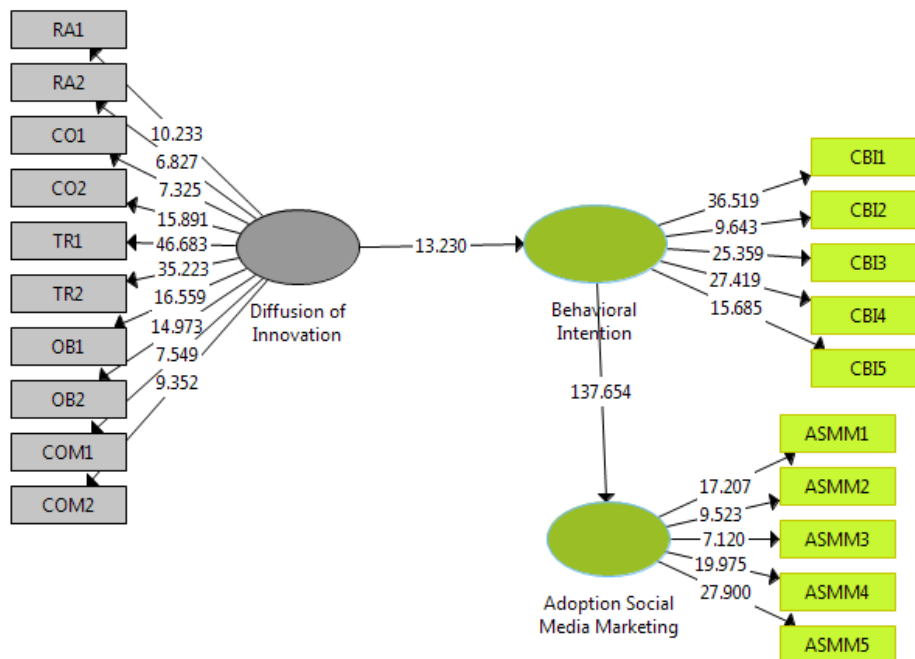


Figure 5: Coefficient significance test without moderator variable

Note: \* $p < 0.05$ ; \*\* $p < 0.01$ ; \*\*\* $p < 0.001$

As it was predicted in this study, all hypotheses of this study were confirmed. The given results from this study indicate that all research hypotheses are approved. Likewise, the findings derived



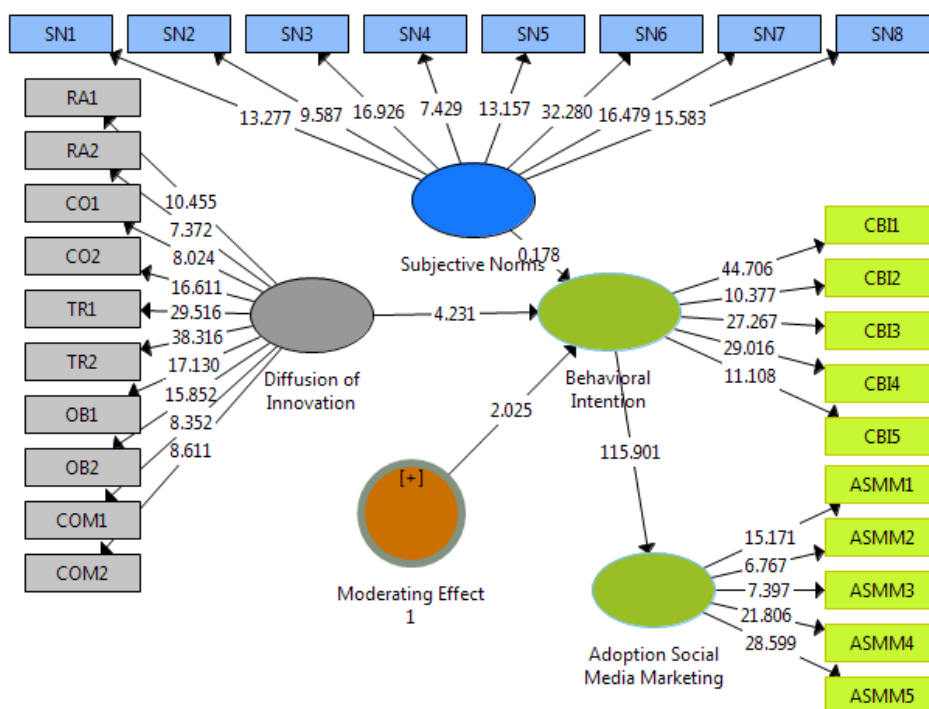


Figure 6: Coefficient significance test with moderator variable

Table 10: Results of tests

Hypotheses	Relations	Path coefficient	T-value	Probability	Results (Prob.)
Hypothesis I	DoI → Users BI	0.821	13.230***	P<0.001	Supported
Hypothesis II	Users BI → Adoption SMM	0.961	137.654***	P<0.001	Supported
Hypothesis III	Subjective norms moderates relationship among DoI and Users BI	0.129	2.025	P<0.05	Supported

from this chapter show strong fitness of the proposed model.

### 5. Conclusion

The main objective of this study is to investigate and identify the factors that influence BI Users to adopt SMM in Iran based on DoI model. On the whole, the influence of RA, CO, TR, OB, COM was examined in this study as well as trust on the behavioral intent to lead to the adoption of social media among social media consumers in Iran. The results showed that all factors positively affect BI to SMM adoption. The results show that DoI influences BI Users to SMM adoption in Iran. Moreover, the results indicate that BI has the strongest influence on users to adopt SMM. The second strongest factor that affects the BI to adopt SMM is DoI model. The third most influential factor is proving the moderating role of subjective norms in the relationship between DoI model and BI. The study finally concludes that Iranian users are willing to adopt SMM. The results indicated that power of social network will enhance the development of e-commerce in the future [77].

By playing up the role of social media in everyday life and their entry in the stream of small businesses, owners of big industries have also transformed the method of their communication and promotion and accepted social media as a strong media. One of the reasons for quick popularity

of social media among enterprises is the virus-like spread of data via internet. Thus, social media has been converted into a strategic tool for marketing between the owners of industries to develop brands. These tools are very cost-effective by wide communication and interaction with users and low cost to introduce goods. Hence, enterprises have tendency toward social media to attract customers in recent years. The current study provides research in different dimensions. First of all, as far as we know, this study is one of the pioneer studies drawn from a wide variety of literature of social media technology to analyze the history of SMM adoption. It is shown specifically in this study that the theory of reasoned action model M Fishbein and I Ajzen (1975), theory of planned behavior Icek Ajzen (1991) and the innovation characteristics of the DoI model Everet M Rogers (1983) are theoretically supplementary in explaining SMM adoption. Accordingly, the conceptualization and research model permits the effects of different types of SMM uses and further investigation of gratifications. Second, the detailed yet affordable research model makes an urgent contribution to the SMM emerging literature, by constructing the variables and putting them on a new context of the study of social media according to the dominant theories and the innovative characteristics of Rogers. As the prior literature has presented diverse variables to predict media needs, the current study has identified the most necessary items for social media. These items comprise dimensions of innovation model, subjective norms, BI users and SMM adoption. This implies the importance of innovative characteristics in enhancing the adoption behavior of consumers. As the consumers get experienced in using the innovative technology, more considerations emerge and significant determining of behavior adoption is gained. Hence, the relational element of innovation characteristic plays an important role in social media adoption.

## **6. Management recommendations and contribution**

This study and the results obtained contribute to tailor SMM activities based on the demands and expectations that the users have which are basically diverse. Developing strategies and tactics to attract and maintain customer relations will only be possible through an understanding of the different typology of social media needs. Furthermore, according to what is said, the connections with potential customers can be customized at an individual level. The media needs lead consumers to make use of SMM and can serve as a main understanding regarding the way in which targeting and positioning strategies can launch making connections with consumers in order to satisfy these needs. Keeping on technological advances leads marketers to have the capability to track and store customer information optimally by the conversations they have with the consumer via social media; however, customizing the offerings to be suitable with the needs and desires that the customers have. The findings of this study have significant contributions that can be categorized under contribution to the body of knowledge, to the practitioners and stakeholders to regulate their business strategies more accurately in developing a better social media platform, as well as the contribution to the policy makers and regulators to motivate other and new marketers in setting up business via social media since they might be lacking knowledge and encouragement in doing so.

## **7. Research limitations and future works**

Although these findings are encouraging and useful, like all researches, our study has its limitations that warrant caution in interpreting the results. So, there are several recommendations provided for the purpose of further studies in this topic. The first limitation centers around the research context where this research was precisely conducted in Iran context, which applies restrictions on generalizing the results to other countries. Also, it is suggested for the future researchers to

choose a larger sample size of respondents in their country in order to reach the information that are more reliable and make sure of the generalizability of the findings. Applying the findings extensively for the users worldwide is limited because local culture, status and lifestyle effects usage and pattern. It is recommended for the future researchers to concentrate on cultural differences by doing more examination on the cross-cultural issues.

Second, additional dimensions for independent variables can be added into the research model for the purpose of identifying the other dominant factors that affect behavioral intent to adoption social media such as perceived ease of use and considered costs. Third, based on the fact that social media is a phenomenon worldwide, it is beneficial for future researchers to analyze the items that affect young customers' behavioral intent by SMM through multinational contexts. The fourth limitation centers around the research model where the results were expanded and interpreted mainly in one direction. All of those who were involved in the hypothesized model were evaluated at a specific point in time. So, to make more use of this model in the future, it is recommended to examine other possible paths. For the researchers conducted in future, longitudinal study would supply the inferences of cause and effect. There are two guiding parameters for adopting SMM constructs in this research which reveal conceptual ideas and supporting empirical evidence. These have been integrated and rationalized to form a comprehensive and reasonable model.

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