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AN INTEGRATED MODEL OF ONLINE USERS' BEHAVIOUR TOWARDS IMAGE USE IN SOCIAL MEDIA

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ABSTRACT

Nowadays, social media is an irresistible technology for Internet users. Users commonly use images on social media to express their feelings or share their experiences or thoughts. However, prior studies show that more effort needs to be made to delve into the significant role of motivation, engagement, and belief when users use images on social media. Building on the findings of related literature, this paper integrates the Uses and Gratifications Theory (UGT), Two-Sided Structure (TSS) in social media, and the Extended IT Continuance Model (EICM) to explore users' behaviour on image use in social media. The integrated model has been reviewed and validated by 10 experts from different universities, private sectors, and government agencies. All data collected were analysed using the Fuzzy Delphi Method (FDM), where the findings show the threshold value is less than 0.2 and the percentage of expert consensus is over 75%. Therefore, the integrated model can provide imperative factors for understanding users' behaviour on image use in social media. Hence, the model can also be used as a guideline or reference for government agencies or non-government organizations (NGOs) to provide helpful information on image use in social media.

1.0 INTRODUCTION

Recently, social media has evidently gained immense influence and support in business and even in academic contexts. A study by Izuagbe et al. (2019) found that nearly 70% to 87% of students in educational institutions have been reported to use social media sites for both academic research and everyday life activities [1]. Furthermore, as the number of students using social media increases, the interest in assessing social media applications and the factors that encourage them has also increased [2]. There are motives that influence them to engage in social media, such as sharing their images and photographs and also posting news [3]. Recent statistics show that social media posts that include images receive more engagement than those that do not [4]. Moreover, images are becoming a prominent means of communication online [5]. With the knowledge of gratifications, an image such as a picture is posted across most social media platforms, where users deliberately craft the way they are viewed by others and encourage them to engage in social media on a regular basis [6]. In addition, when telling their story and crafting their identity, it may also disclose greater insight into the user's life and character [7].

Several research studies have used various Information Systems (IS) theories or models to assess the acceptance of social media [8]. One of the theories that has lately gained the attention of IS researchers is the Uses and Gratifications Theory (UGT), which has a lot of potential to explore the use of the Internet, particularly social media [9]. Hossain et al. (2019) have adopted UGT to create an integrated model that predicts users' intention and behaviour on social media. In addition, Saini and Abraham (2019) apply UGT and motivation to assess users' perceptions of educational usage of social media. It is also found that

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social media is an emerging technology in education [12-16]. Although the theory has proven useful in understanding user intention and behaviour, there has been little study into the use of images in social media [17]. Hence, this research study attempts to develop an integrated model that can explain the factors that influence image use in social media.

The paper structure is as follows: First is the discussion of literature related to this study, followed by a presentation of the research methodology used, later findings, limitations, and future research, and finally the conclusion and implications of the study.

2.0 LITERATURE REVIEW

2.1 Use and Gratifications Theory (UGT)

Users and Gratifications Theory (UGT) explains how people use media and explores various gratifications that drive media use [18]. It is applied in social media to investigate user motives and participation [7] [18]. The different impacts of gratifications on people's motivation for intentions and behaviours are highlighted by UGT [19]. It is found that social media users will select certain social media platforms and features based on their perception that their needs can be met by the media. UGT is also known as the comprehensive theory, which tries to define a set of independent variables as well as give a model or framework for motivation and gratification [19]. Moreover, UGT allows users to engage with social media and gain numerous gratifications [20-22]. For instance, are Enjoyment, Entertainment, Social Influence, Social Interaction, and Information Sharing.

When people use social information technology, Enjoyment is described as sensations that make them happy [10, 22]. Krasnova et al. (2017) indicate social media can offer various forms of Enjoyment. Individuals can, for example, use public accounts to view rich digital content that their contacts have published and shared. Likewise, the use of social media meets the needs of consumers for enjoyment and enhances their inner satisfaction. Amanda Kearney and Kircaburun et al. (2020) define Entertainment as the extent to which social media content is pleasant for passing the time, taking a break, and having a good time. It was the final pleasure discovered to be correlated with social media activities to relieve boredom or just to have fun [23]. It is also known as one of the most commonly studied motives and gratifications in studies of the relationship between social media use and addiction [24].

Rajanen & Weng (2017) defined Social Influence as the individual's perception that other users believe the technology should be used. According to Hossain et al. (2019), Social Influence was the most important factor that affected social media adoption. Social Influence captures the perceived expectations of individuals or groups of specific referents of a person and his or her motivation to meet these expectations [25]. Recently, IS researchers have been interested in exploiting the Social Influence factor for better insight into the social circle in a digitized society [26]. Kircaburun et al. (2020), Hossain et al. (2019), and Asghar (2015) defined Social Interaction as the ability to interact and socialize with other people. Social Interaction is also related to a desire to engage with people, a sense of belonging, and the avoidance of isolation, as well as having a significant impact on consumer attitudes about social media use [27-28]. Information sharing, according to Liu et al. (2019), is defined as the acts of obtaining and disseminating information, which are frequently related to interactions or connections between users on social media. User happiness with a social media network is also aided by the Information Sharing process [27, 29].

2.2 Two-Sided Structure In Social Media (TSS)

Social media is a valid medium for the so-called Two-Sided Structure [30], which is a two-sided market. It is a circular structure that comprises producer-generated content that enhances the utility of audiences, while the audience gives feedback that improves the utility of producers. This is supported by Yu et al. (2020), where social media platforms, or creators, are the platforms used by producers to create content for audiences. Content and feedback are the terms for the sharing and circulation of content on social media. Audiences and interactions are exposed to the content posted by producers, while feedback from audiences returns to producers, such as clicking the like button and sharing the content media [31]. Several examples of content and feedback are posted, liked, and shared.

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Guy et al. (2016) defined posts as informative and entertaining content as the most influential factors. For attention trends, the style of the post is important, with richer content, such as images, that boosts attention, particularly for social and news posts [32]. Compared to text, image content in a social media post can provide knowledge, aesthetic, or self-enhancement value that can increase the total appeal of the Post [33]. Bakhshi et al. (2019), Al-Qaysi et al. (2020), and Guy et al. (2016) defined like as content that is interesting to users. Like is positively associated with the interest of customers and the influence of posts [8,34]. Like has made it possible for users to actively support post activity. Like has also increasingly become one of the most popular behaviours performed by users and is an indicator of interest and even popularity or reputation. It is known that users who click on the like button are more involved, active, and linked than the typical user [35]. Guy et al. (2016) and Ozanne et al. (2017) defined share as fulfilling users' intrinsic and extrinsic needs. Moreover, social media is a platform used to share information rather than for other purposes where sharing is the intention and behaviour that remain important [36]. As a reminder of memories, photos or images may also be used to share stories of memories and moments [37].

2.3 Extended IT Continuance Model (EICM)

The Extended IT Continuance Model (EICM) theorises and empirically validates an enlarged IT continuance model, covering gaps in the literature on IT continuity. It incorporates continuance behaviour into the model and elaborates contingent aspects that may influence IT continuance intention and behaviour [38]. It offered a superior and logical explanation for IT continuance behaviour. Due to the inclusion of IT self-efficacy as a predictor variable, over and above consumer satisfaction with earlier use, this model, which was derived from the original continuation model, provided far more clarity of continuance intention than the original continuance model. In the context of social media use, if the user has produced a happy or positive emotional state because of the assessment of social media, the user is more likely to post or otherwise connect with friends on social media in the long term. People are more likely to use social media for communication and interaction over time, which means that more people can continue to use it [38-39]. For instances Satisfaction, Continuance Intention and Continuance Behaviour.

Satisfaction was described by Kircaburun et al. (2020) as a strong emotional response to the actual use of social media applications. Research by Ajis and Salleh (2020 discusses how people use the media to satisfy their needs and the factors that contribute to the satisfaction of social media use. discusses how people use the media to satisfy their needs and the factors that contribute to the satisfaction of social media use. Al-Qaysi et al. (2020) and Kircaburun et al. (2020) defined Continuance Intention as pleasurable or positive emotion when using social media for the long term. In the perspective of the social media presence in everyday life, the user's Continuance Intention depends not just on the technological aspect of social media, but also on the effect of satisfaction on users [40]. Continuance Behaviour, as defined by Kircaburun et al. (2020), is the willingness to use social media for communication and interaction over time. An investigation of the user satisfaction implications of the Continuance Intention can help to gain a deeper understanding of its main role in influencing the Continuance Behaviours of the user [35].

3.0 RESEARCH METHODOLOGY

The methodology of this research study consisted of three phases. The first phase was focused on identifying related factors that influence image use in social media through theory and models. The second phase involved the development of the proposed integrated model of image use in social media. The third phase involved the proposed model being reviewed by experts. Figure 1 illustrates a summary of the research phases involved in this research study.

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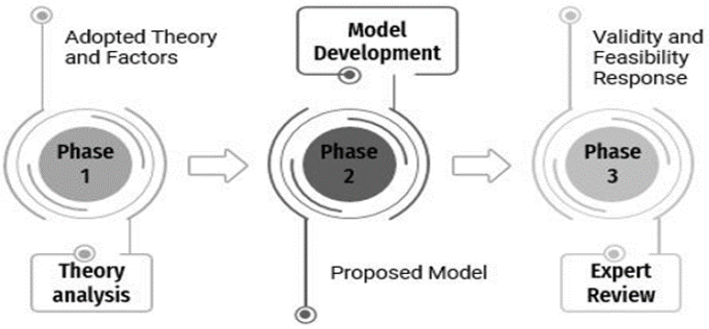

Figure 1. Research phase

The following subsections discuss the details of the three phases of the research methodology:

3.1 Theory Analysis

There are limited research studies that have been conducted to study the continuous use of social media intentions and behaviours [41]. Therefore, this research study has initially selected theories and models, namely, the Uses and Gratifications Theory (UGT), the Two-Sided Structure in social media (TSS), and the Extended IT Continuance Model (EICM). A study by Majeed et al. (2021) discusses how scholars have used UGT to explore a variety of social media engagements, such as sharing and posting photos. In UGT, there are many motives for using social media, including entertainment and social interaction. UGT has also recently been used by many studies to assess the intention to continue using social media [42-43].

Part of it is that TSS clearly shows users have the intention to continue using social media when they satisfy their UGT motives [30]. Jung and Lee (2016) have introduced TSS as a model for continuous user engagement in social media. TSS engagement factors, such as Post (from the producer) and Like (from the audience), are part of the model that contribute to user intention in using social media. TSS also found that both factors have a positive effect on users' continuous intention to use social media. Meanwhile, EICM is introducing the linkage between continuous intention and behaviour. EICM also discussed how users' satisfaction has a more dominant impact on continued intention when the intention is measured immediately after the user's experience. Therefore, 11 factors or constructs have been extracted from the literature review with their respective references. They are Enjoyment, Entertainment, Social Influence, Social Interaction, and Information Sharing from UGT; Post, Like and Share from TSS; and Satisfaction, Continuous Intention, and Continuous Behaviour from EICM. Table 1 tabulates the operation definition involved in this research study.

Table 1. Operation Definition

Theory/Model	Factors/Constructs	Operation Definition
Uses and Gratifications Theory [18]	Enjoyment [10,22]	Feels inspired and pleasure when use image in social media
	Entertainment [23-24]	Feels fun when use image in social media
	Social Influence [25]	Feels that other users believe image should be use in social media
	Social interaction [10, 24, 27]	Feels interact and socialize with other users when use image in social media
	Information Sharing [29]	Feels interact or connect with other users when seeking or disseminating information while use image in social media
Two-sided Structure in social media [32]	Post [32]	Use image as informative and entertaining content in social media
	Like [5, 8, 32]	Use image as content is interesting to user
	Share [32, 35]	Use image as content is fulfil user intrinsic and extrinsic needs
Extended IT Continuance model [41]	Satisfaction [38]	Feels a significant emotion reaction related to image use in social media
	Continuance Intention	Feels pleasurable or positive emotional when use

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	[10, 38]	image in social media for the long term.
	Continuance Behaviour [38]	Feels willingness to continue use image in social media for communication and interaction over time

3.2 Model Development

Based on the previous section, this research study proposed an integrated model containing UGT motive factors that influence users' satisfaction (the EICM factor) and engagement (the TSS factors) that will affect EICM factors in continuing to use images in social media. In addition, according to Luo and Remus (2014) and Krasnova et al. (2022), the Integrated Model can extend the boundaries of accepted theories and previous theories on social media to explain differences in social media use. It has a number of determinants that can be used to effectively assess user acceptance and adoption [44]. Moreover, the integrated model does reflect earlier unification models of technology acceptance, adoption, and use [45]. It also addresses the research gaps to explore determinants of continuous use of social media, besides rehabilitating, updating, and integrating determinants within the theory [46-47s].

As depicted in Figure 2, the integrated model proposed contains five UGT motive factors, three EICM belief factors, and three TSS engagement factors. In total, there are 11 factors or constructs and 13 relationships within constructs. The relationships show identified factors influencing other factors designed in the integrated model proposed.

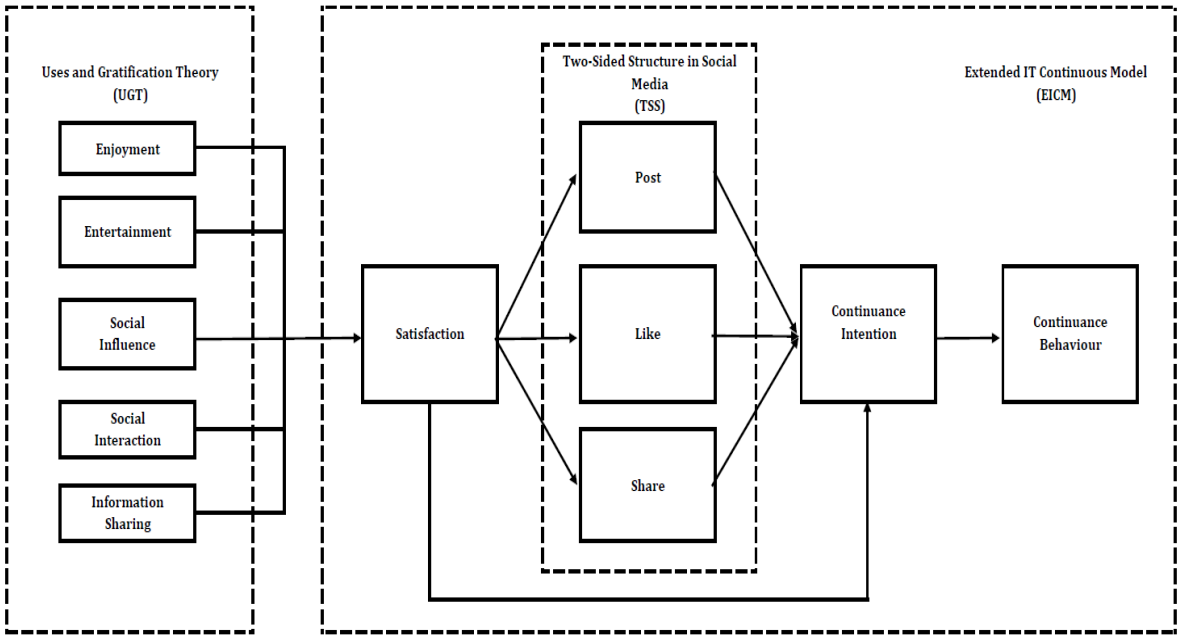

Figure 2. Integrated research model proposed

3.3 Expert Review

Expert review is a method used to evaluate and verify the proposed model before any survey is carried out [48]. The aim of expert review in the context of this research study is to let the experts confirm the validity and feasibility of the proposed model. It is also shown that expert reviews provide confirmation that the model is strong and acceptable to users [49-50]. This research study has chosen the Fuzzy Delphi Method (FDM) approach, introduced by Murray et al. (1985) which was later developed by Kaufmann and Gupta (1988). FDM is a hybrid set of Fuzzy theory and the Delphi method, where FDM is a tool that 'improves' on the existing Delphi technique [51-52].

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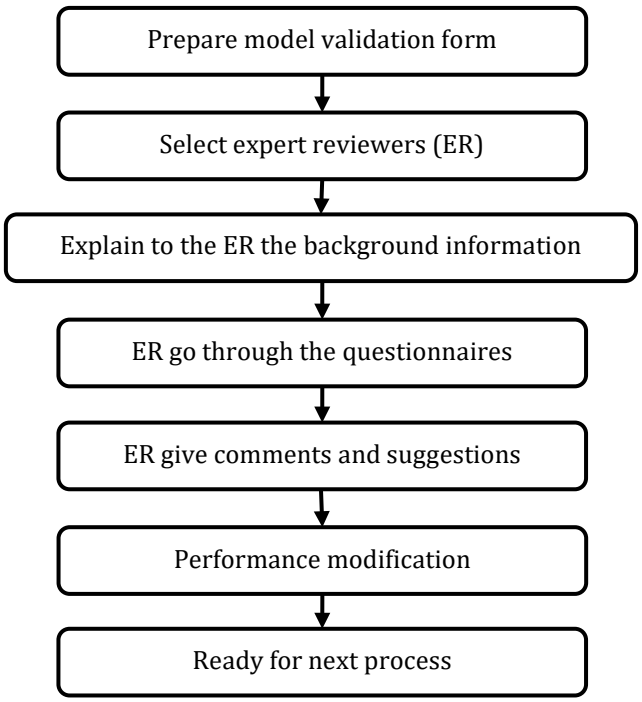

Figure 3. The expert review development process [57]

Figure 3 shows the whole process of conducting the expert review in this research study. This process is introduced by Abdul Mutalib et al. (2019). The process begins with the preparation of the model validation form, which is based on the literature reviewed from a variety of sources, including reputable books, research, and related publications. Ten (10) experts are later identified; consisting of three academicians and seven practitioners in various Information Technology (IT) fields to ensure feedback given are based on vast background knowledge. As suggested by Mohamed et al. (2019), experts are also selected based on a minimum of three (3) years of experience. Table 2 shows the experts' profile summary:

Table 2. Experts' profile summary

Expert	Position	Field	Year of Experience
1	Practitioner	Networking Compliances	15
2	Practitioner	Information Technology	19
3	Practitioner	Corporate Communication	3
4	Academician	Semantic Technology and Information Retrieval	15
5	Practitioner	Software Engineering and E-Commerce	10
6	Academician	New digital social media and marketing	10
7	Practitioner	Media (Traditional & New)	22
8	Practitioner	Industrial Production Statistic	6
9	Academician	Multimedia and HCI	15
10	Practitioner	Cybersecurity	15

An invitation to the expert panel was sent via email. The expert panel is explained in terms of the purpose of the model, its role, and the processes involved. After stating the agreement, an email containing the model validation form and a Google Form link is sent. The questionnaire required the expert panels to evaluate and provide views on the suitability of the proposed factors and their relationships, further identifying the importance of the factors that influence image use in social media. The importance of factors is determined by using a seven-point Likert scale, which is more accurate and appropriate for electronically distributed questionnaires. The use of the 7-point Likert Scale is also due to the increased accuracy and precision of the data collected [54-55]. Therefore, this process is necessary to ensure that the proposed factors are appropriate to be used in the conceptual model and the context of the study. Table 3 shows questions provided to the expert reviewers:

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Table 3. Expert reviewers' questionnaire

Question	Question related to relationship within construct
1	Enjoyment have influenced effect as a motive of Image Use Satisfaction?
2	Entertainment have influenced effect as a motive of Image Use Satisfaction?
3	Social Influence have influenced effect as a motive of Image Use Satisfaction?
4	Social Interaction have influenced effect as a motive of Image Satisfaction?
5	Information Sharing have influenced effect as a motive of Image Use Satisfaction?
6	Image Use Satisfaction have influenced effect on triggering motivation of Post in social media?
7	Image Use Satisfaction have influenced effect on triggering motivation of Like in social media?
8	Image Use Satisfaction have influenced effect on triggering motivation of Share in social media?
9	Image Use Satisfaction have influenced effect on Continuance Image Use Intention in social media?
10	Satisfying use motive of Post have influenced effect on Continuance Image Use Intention in social media?
11	Satisfying use motive of Like have influenced effect on Continuance Image Use Intention in social media?
12	Satisfying use motive of Shares have influenced effect on Continuance Image Use Intention in social media?

After considering feedback from the expert panel, the model is reviewed, refined, and updated. It is then ready for the next process: the formulation of the research hypothesis.

4.0 FINDINGS, LIMITATIONS AND FUTURE RESEARCH

4.1 Findings

As discussed by Zulkifli et al. (2015), this research study employed a 7-point Likert scale, which is similar to a 7-point linguistic variable scale. In addition, triangle numbering, which is based on fuzzy numbering, has been added. All experts are needed to state the consensus level between extreme disagreement and extreme agreement. The data from the 7 Likert scale was then translated into Fuzzy number data form, which Microsoft Excel software was used to analyse. Three fuzzy values representing an expert opinion (fuzzy expert opinion) are used to mark each response received. Triangular Fuzzy numbers and the defuzzification process are two main concepts in FDM.

The values of m1, m2, and m3 are grouped in the form of a triangular fuzzy number, which is commonly displayed in the form (m1, m2, m3). The value of m1 indicated the lowest value, the value of m2 the most reasonable value, and the value of m3 the highest value. A fuzzy scale was created using triangular fuzzy numbers to transfer linguistic characteristics (like the Likert scale) into fuzzy numbers. On a fuzzy scale, the number of levels of agreement was odd. The higher the Fuzzy scale, the more precise the results. After all the Likert Scale data were obtained from the experts, the process of collecting and analysing them using FDM was carried out, where they were analysed using an Excel programme for neat scheduling. A triangular fuzzy number was used to convert all the data. The Fuzzy 7-point scale shows that a higher number on the scale indicates more accurate and precise data. As in Table 4, the researcher substituted a scale of 1 to 7 for the Fuzzy 7-point scale value to make it easier for the expert to answer the questionnaire:

Table 4. Linguistic variable scale - 7 points [61]

	Consensus Level (7 points)	Fuzzy Numbers		
1	Extremely Disagree	0.0	0.0	0.1
2	Strongly Disagree	0.0	0.1	0.3
3	Disagree	0.1	0.3	0.5
4	Moderately Agree	0.3	0.5	0.7
5	Agree	0.5	0.7	0.9
6	Strongly Agree	0.7	0.9	1

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	Consensus Level (7 points)	Fuzzy Numbers		
7	Extremely Agree	0.9	1	1

According to the calculation in the formula, the value of d was the threshold value. If the value is d ≤ 0.2, it means that all the experts have come to a consensus (agreement). If this did not occur, a second round was required to determine whether the relationship was required [58-59]. The FDM procedure also included establishing whether a group of experts' consensuses exceeded or equalled 75 percent for the entire relationship within the model's construct. If the proportion of expert consensus for each relationship was equal to or more than 75%, it was assumed that they had reached expert consensus [50-60]. In addition, This research study also applied the defuzzification process to determine the position of each relationship within the construct, as stated in [52]. The following is the formula for calculating the distance between two Fuzzy numbers:

$$d(\tilde{m},\tilde{n}) = \sqrt{\frac{1}{3}\left[(m_1 - n_1)^2 + (m_2 - n_2)^2 + (m_3 - n_3)^2\right]} \quad (1)$$

Table 5 shows the results of the threshold value (d) and expert consensus findings for 13 relationships within 11 constructs in the proposed model. The result demonstrates that relationships 1, 2, 3, 4, 5, 9, 10, 11, and 13 were highly approved by a group of experts with a 100% approval rate. The relationships are related to UGT motive factors, which are highly agreed to influence users' satisfaction using images in social media. Experts also highly agreed that satisfaction does have an impact on the continuous intention and behaviour of users to use the image on social media. TSS engagement factors (posts and likes) are widely agreed to also influence users' intentions to continue using images on social media. Relationships 6, 7, 8, and 12, on the other hand, obtained a 90% approval rating from a panel of experts. The threshold values are blacked out above the threshold value of 0.2 (> 0.2) in Table 4. This indicates that expert opinion is divided and that certain issues have yet to be resolved. However, all 13 relationships had a threshold value (d) of less than 0.2. It demonstrated that it had received majority expert approval [59]. It's also related to the percentage of expert consensus, which indicates that the number is greater than 75% and has received majority consent from all experts [61].

Tables 5. Threshold value (d) and expert consensus percentage

Expert vs Relationships	1	2	3	4	5	6	7	8	9	10	11	12	13
1	0.041	0.056	0.274	0.107	0.107	0.084	0.324	0.338	0.245	0.056	0.031	0.069	0.056
2	0.123	0.099	0.117	0.046	0.046	0.084	0.069	0.054	0.147	0.099	0.031	0.069	0.099
3	0.123	0.099	0.117	0.046	0.046	0.084	0.069	0.054	0.147	0.099	0.031	0.069	0.099
4	0.123	0.099	0.117	0.046	0.046	0.084	0.069	0.054	0.147	0.099	0.031	0.069	0.099
5	0.123	0.099	0.117	0.046	0.046	0.084	0.069	0.054	0.147	0.099	0.031	0.069	0.099
6	0.041	0.056	0.117	0.046	0.046	0.071	0.069	0.054	0.245	0.056	0.031	0.324	0.056
7	0.270	0.295	0.274	0.107	0.107	0.071	0.086	0.101	0.039	0.056	0.031	0.086	0.056
8	0.270	0.056	0.274	0.046	0.046	0.071	0.086	0.054	0.245	0.295	0.122	0.069	0.295
9	0.123	0.099	0.117	0.046	0.046	0.084	0.069	0.054	0.147	0.099	0.031	0.069	0.099
10	0.041	0.056	0.117	0.107	0.107	0.309	0.069	0.054	0.039	0.056	0.122	0.086	0.056
Threshold value (d) of relationship	0.128	0.101	0.164	0.064	0.064	0.103	0.098	0.087	0.155	0.101	0.049	0.098	0.101
Expert consensus Percentage	100.0	100.0	100.0	100.0	100.0	90.0	90.0	90.0	100.0	100.0	100.0	90.0	100.0

* Requirement 1: Threshold value (d) ≤ 0.2, therefore, accepted [63].
* Requirement 2: Expert Percentage ≥ 75%, therefore, accepted [65]

Table 6 shows the defuzzification process in determining the position or ranking of each relationship as validated by experts:

Table 6. Defuzzification process

No.	Relationship	Average of Fuzzy Response	Expert Consensus Result	Expert Consensus Ranking
1	Enjoyment have influenced effect as a motive of Image Use Satisfaction?	0.883	Accepted	12
2	Entertainment have influenced effect as a motive of Image Use Satisfaction?	0.900	Accepted	8

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3	Social Influence have influenced effect as a motive of Image Use Satisfaction?	0.887	Accepted	11
4	Social Interaction have influenced effect as a motive of Image Satisfaction?	0.937	Accepted	2
5	Information Sharing have influenced effect as a motive of Image Use Satisfaction?	0.937	Accepted	2
6	Image Use Satisfaction have influenced effect on triggering motivation of Post in social media?	0.910	Accepted	7
7	Image Use Satisfaction have influenced effect on triggering motivation of Like in social media?	0.920	Accepted	6
8	Image Use Satisfaction have influenced effect on triggering motivation of Share in social media?	0.930	Accepted	4
9	Image Use Satisfaction have influenced effect on Continuance Image Use Intention in social media?	0.867	Accepted	13
10	Satisfying use motive of Post have influenced effect on Continuance Image Use Intention in social media??	0.900	Accepted	8
11	Satisfying use motive of Like have influenced effect on Continuance Image Use Intention in social media?	0.947	Accepted	1
12	Satisfying use motive of Shares have influenced effect on Continuance Image Use Intention in social media?	0.920	Accepted	5
13	Continuance Image Use Intention on social media have influenced effect on Continuance Image Use Behaviour in social media?	0.900	Accepted	8

*Requirement 3: The value of defuzzification should exceed Alpha-Cut, α-cut = 0.5, therefore, accepted [66].

Based on Table 6, it is found that all experts highly agree that the TSS engagement factor (Like) does highly influence users' intention to use images in social media, while users' satisfaction with UGT motives has less influence on users' intention to continue using images in social media. However, the table, on the other hand, did show that all 13 relationships achieved expert consensus when all Alpha-Cut defuzzification (the average of fuzzy responses) exceeded 0.5. Based on the requirement, Alpha cut values should be greater than 0.5 [62]. In addition, as shown in Table 6, the agreed-upon items are sorted according to their ranking. Overall, all the relationships received an agreement with a high consent value and met all the requirements. The findings of the consensus and expert consensus analyses show that the value of the agreement is high. Therefore, this research study has successfully shown the model proposed does achieve expert agreement in determining the factors that influence images used in social media.

4.2 Limitations

This research study focuses on three phases of Research Methodology: Theory analysis, Model development, and Expert Review. However, this research study did not discuss the formulation of research hypotheses, which does contribute to the design of questionnaire items. Therefore, there is no discussion on the evaluation of model effectiveness in relation to the research hypothesis developed. It was found that neither data collection nor data analysis related to the research hypothesis were discussed. The expert review feedback are only data discussed on the data collection and analysis of FDM, which is the key point in validating and improving the model proposed.

4.3 Future Research

An expert review using the Delphi method by Gracht (2012) can be explored as an alternative to solve the problem of ambiguity in expert consensus. While content validity approaches such as the Lawshe method can be used to validate questionnaire, items developed based on the validated model, Meanwhile, SPSS can be used for reliability testing and Partial Least Squares - Structural Equation Modelling (PLS-SEM) to evaluate the effectiveness of the research model proposed. The PLS-SEM method is also another method that can be used to see the relationship between constructs and items in the validated model. Quantitative or qualitative methods can also be used in preliminary and post-study studies. Besides, the validated model that has been evaluated for its effectiveness may later be further discussed and compared. With this comparison, it does help to analyse and clearly show what happened before and after the expert validation process. Furthermore, other factors related to users' motives, engagement, and continuance to use an image or any type of information on social media can also be explored.

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5.0 CONCLUSION AND IMPLICATION

5.1 Conclusion

This research study integrates the theoretical viewpoints and empirical findings of the Uses and Gratifications Theory (UGT), Two-Sided Structure in social media (TSS), and Extended IT Continuance Model (EICM) studies to investigate the factors that influence images used in social media. This research study involved three phases of research methodology: theory analysis, model development, and expert review. The theory analysis adapted a theory and two models, which contributed to the development of the model, consisting of 11 factors and 13 relationships that have been validated by 10 experts using the Fuzzy Delphi Method (FDM). It is shown that the integrated models proposed do gain expert consensus, where five factors in UGT influence users' satisfaction to engage with three factors in TSS, which affect users' intention and behaviour in continuing to use images in social media.

5.2 Implication

Theoretically, this research study explores the body of knowledge on theory and models related to users' motives, engagement, and continuation of image use in social media research. This research study was able to overcome psychological impediments and enhance self-reliance on social media participation by analysing the interaction between the factors in the proposed model. Apart from that, consideration of users' motives, engagement, and continuance towards the image will help in planning, designing, developing, testing, or deploying the updated social media platform features.

Practically, with awareness of factors influencing behaviour, this research study can provide guidance in finding solutions to increase the number of users who actively participate and engage in social media. This is because, with this understanding, it does help to improve management, industries, businesses, and marketers use of image perspectives efficiently to effectively market and communicate with their existing and potential customers or users. Moreover, this research study can also be used as a reference in developing policies, standards, or guidelines and raising awareness related to information used in social media, focusing on the image of Non-governmental Organisations (NGOs), government agencies, and ministries. With this research study, cases such as the Like and Share' competition, which is highly ranked as a scam, can be explored, and used in a better way to explain users' intention and behaviour to produce (post) and give feedback (like, share) on any information, including images. Therefore, it is clearly shown that the integration of UGT, TSS, and EICM factors does help with further investigation.

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List of Reference

[1] Izuagbe, R., Ifijeh, G., Izuagbe-Roland, E. I., Olawoyin, O. R., & Ogiamien, L. O. (2019). Determinants of perceived usefulness of social media in university libraries: Subjective norm, image and voluntariness as indicators. The Journal of Academic Librarianship, 45(4), 394-405.

[2] Salloum, S. A., Al-Emran, M., & Shaalan, K. (2018). The impact of knowledge sharing on information systems: a review. In Knowledge Management in Organizations: 13th International Conference, KMO 2018, Žilina, Slovakia, August 6–10, 2018, Proceedings 13 (pp. 94-106). Springer International Publishing.

[3] Salloum, S. A., Mhamdi, C., Al Kurdi, B., & Shaalan, K. (2018). Factors affecting the adoption and meaningful use of social media: a structural equation modeling approach. International Journal of Information Technology and Language Studies, 2(3), 96-109.

[4] Ilias, I. S. B. C., Ramli, S., Wook, M., & Hasbullah, N. A. (2021). Technology Adoption Models: Users' Online Social Media Behavior Towards Visual Information. In Computational Science and Technology: 7th ICCST 2020, Pattaya, Thailand, 29–30 August, 2020 (pp. 15-26). Singapore: Springer Singapore.

*Corresponding Author | Ramli, S. | suzaimah@upnm.edu.my

[5] Bakhshi, S., Shamma, D. A., & Gilbert, E. (2014, April). Faces engage us: Photos with faces attract more likes and comments on instagram. In Proceedings of the SIGCHI conference on human factors in computing systems (pp. 965-974).
[6] Lowe-Calverley, E., & Grieve, R. (2018). Thumbs up: A thematic analysis of image-based posting and liking behaviour on social media. Telematics and Informatics, 35(7), 1900-1913.
[7] Bounab, Y., Oussalah, M., & Beddiar, D. R. (2020, November). Impact of quality of images on users behavior on social media. In 2020 Tenth International Conference on Image Processing Theory, Tools and Applications (IPTA) (pp. 1-6). IEEE.
[8] Al-Qaysi, N., Mohamad-Nordin, N., & Al-Emran, M. (2020). A systematic review of social media acceptance from the perspective of educational and information systems theories and models. Journal of Educational Computing Research, 57(8), 2085-2109.
[9] Luo, M. M., & Remus, W. (2014). Uses and gratifications and acceptance of Web-based information services: An integrated model. Computers in Human Behavior, 38, 281-295.
[10] Hossain, M. A., Kim, M., & Jahan, N. (2019). Can "liking" behavior lead to usage intention on Facebook? Uses and gratification theory perspective. Sustainability, 11(4), 1166.
[11] Saini, C., & Abraham, J. (2019). Modeling educational usage of social media in pre-service teacher education. Journal of Computing in Higher Education, 31, 21-55.
[12] Hashim, K. F., Rashid, A., & Atalla, S. (2018). Social Media for Teaching and Learning within Higher Education Institution: A Bibliometric Analysis of the Literature (2008-2018). International Journal of Interactive Mobile Technologies, 12(7).
[13] Zabidi, N., & Wang, W. (2021). The Use of Social Media Platforms as a Collaborative Supporting Tool: A Preliminary Assessment. International Journal of Interactive Mobile Technologies, 15(6).
[14] Al Hashimi, S., Al Muwali, A., Zaki, Y., & Mahdi, N. (2019). The effectiveness of social media and multimedia-based pedagogy in enhancing creativity among art, design, and digital media students. International Journal of Emerging Technologies in Learning (iJET), 14(21), 176-190.
[15] Aleksandrova, Y. G., & Parusheva, S. S. (2019). Social media usage patterns in higher education institutions–An empirical study. International Journal of Emerging Technologies in Learning (Online), 14(5), 108.
[16] Saputra, M., & Al Siddiq, I. H. (2020). Social media and digital citizenship: The urgency of digital literacy in the middle of a disrupted society Era. International Journal of Emerging Technologies in Learning (Online), 15(7), 156.
[17] Ilias, I. S. B. C., Ramli, S., Wook, M., & Hasbullah, N. A. (2021). Technology Adoption Models: Users' Online Social Media Behavior Towards Visual Information. In Computational Science and Technology: 7th ICCST 2020, Pattaya, Thailand, 29–30 August, 2020 (pp. 15-26). Singapore: Springer Singapore.
[18] Katz, E., Blumler, J. G., & Gurevitch, M. (1973). Uses and gratifications research. The public opinion quarterly, 37(4), 509-523.
[19] Dholakia, U. M., Bagozzi, R. P., & Pearo, L. K. (2004). A social influence model of consumer participation in network-and small-group-based virtual communities. International journal of research in marketing, 21(3), 241-263.
[20] Li, P., Chang, L., Chua, T. H. H., & Loh, R. S. M. (2018). "Likes" as KPI: An examination of teenage girls' perspective on peer feedback on Instagram and its influence on coping response. Telematics and Informatics, 35(7), 1994-2005.
[21] Ifinedo, P. (2016). Applying uses and gratifications theory and social influence processes to understand students' pervasive adoption of social networking sites: Perspectives from the Americas. International Journal of Information Management, 36(2), 192-206.
[22] Krasnova, H., Veltri, N. F., Eling, N., & Buxmann, P. (2017). Why men and women continue to use social networking sites: The role of gender differences. The Journal of Strategic Information Systems, 26(4), 261-284.
[23] Kearney, A. (2018). Uses and gratification of posting selfies on social media. Rochester Institute of Technology.
[24] Kircaburun, K., Alhabash, S., Tosuntaş, Ş. B., & Griffiths, M. D. (2020). Uses and gratifications of problematic social media use among university students: A simultaneous examination of the Big Five of personality traits, social media platforms, and social media use motives. International journal of mental health and addiction, 18, 525-547.
[25] Rajanen, D., & Weng, M. (2017, September). Digitization for fun or reward? A study of acceptance of wearable devices for personal healthcare. In Proceedings of the 21st International Academic Mindtrek Conference (pp. 154-163).
[26] Chandrasekara, D., & Sedera, D. (2019). # Activism versus real activism: manifestations of digital

*Corresponding Author | Ramli, S. | suzaimah@upnm.edu.my

social influence in Social Networking Sites. In International Conference on Information Systems 2019: ICIS 2019. Association for Information Systems.
[27] Asghar, H. M. (2015). Measuring information seeking through Facebook: Scale development and initial evidence of Information Seeking in Facebook Scale (ISFS). Computers in Human Behavior, 52, 259-270.
[28] Gao, Q., & Feng, C. (2016). Branding with social media: User gratifications, usage patterns, and brand message content strategies. Computers in Human Behavior, 63, 868-890.
[29] Liu, Q., Shao, Z., Tang, J., & Fan, W. (2019). Examining the influential factors for continued social media use: A comparison of social networking and microblogging. Industrial Management & Data Systems, 119(5), 1104-1127.
[30] Jung, S., & Lee, S. (2016, January). Developing a model for continuous user engagement in social media. In Proceedings of the 10th International Conference on Ubiquitous Information Management and Communication (pp. 1-4).
[31] Yu, C. E., Xie, S. Y., & Wen, J., "Coloring the destination: The role of color psychology on Instagram," *Tourism Management*, Vol.80, 2020, pp.104110.
[32] Guy, I., Ronen, I., Zwerdling, N., Zuyev-Grabovitch, I., & Jacovi, M. (2016, May). What is your organization'like'? A study of liking activity in the enterprise. In Proceedings of the 2016 CHI conference on human factors in computing systems (pp. 3025-3037).
[33] Vraga, E., Bode, L., & Troller-Renfree, S. (2016). Beyond self-reports: Using eye tracking to measure topic and style differences in attention to social media content. Communication Methods and Measures, 10(2-3), 149-164.
[34] Li, Y., & Xie, Y. (2020). Is a picture worth a thousand words? An empirical study of image content and social media engagement. Journal of marketing research, 57(1), 1-19.
[35] Ozanne, M., Cueva Navas, A., Mattila, A. S., & Van Hoof, H. B. (2017). An investigation into facebook "liking" behavior an exploratory study. Social Media+ Society, 3(2), 2056305117706785.
[36] Chua, A. Y., Tee, C. Y., Pang, A., & Lim, E. P. (2016, July). The retransmission of rumor-related tweets: Characteristics of source and message. In Proceedings of the 7th 2016 international conference on social media & society (pp. 1-10).
[37] Ilich, K. L., & Hardey, M. (2020). 'It's all about the packaging': investigation of the motivations, intentions, and marketing implications of sharing photographs of secondary packaging on Instagram. Information, Communication & Society, 23(1), 1-19.
[38] Bhattacherjee, A., Perols, J., & Sanford, C. (2008). Information technology continuance: A theoretic extension and empirical test. Journal of Computer Information Systems, 49(1), 17-26.
[39] Ajis, A., Akma, N., & Salleh, M. (2020). The Core Elements of Motivational Factors that Influence Facebook Users to Self-Disclosure. Int. J. Bus. Manag, 4(2), 1-11.
[40] Jung, H., Lee, G., Hur, K., & Kim, T. T. (2018). Online travel information value and its influence on the continuance usage intention of social media. Service Business, 12, 85-120.
[41] Majeed, M., Owusu-Ansah, M., & Ashmond, A. A. (2021). The influence of social media on purchase intention: The mediating role of brand equity. Cogent Business & Management, 8(1), 1944008.
[42] Alhabash, S., & Ma, M. (2017). A tale of four platforms: Motivations and uses of Facebook, Twitter, Instagram, and Snapchat among college students?. Social media+ society, 3(1), 2056305117691544.
[43] Al-Jabri, I. M., Sohail, M. S., & Ndubisi, N. O. (2015). Understanding the usage of global social networking sites by Arabs through the lens of uses and gratifications theory. Journal of Service Management, 26(4), 662-680.
[44] Rostam, N. A., Zulkiffli, N. F., Ghazali, N. H., Malim, N. H. A. H., Singh, M. M., & Husin, M. H. (2015, August). The acceptance study of NFC technology: A survey of models and user acceptance. In 2015 International Symposium on Technology Management and Emerging Technologies (ISTMET) (pp. 53-57). IEEE.
[45] Venkatesh, V., Thong, J. Y., & Xu, X. (2012). Consumer acceptance and use of information technology: extending the unified theory of acceptance and use of technology. MIS quarterly, 157-178.
[46] LaRose, R. (2010). The problem of media habits. Communication theory, 20(2), 194-222.
[47] Gan, C., Liang, X., & Yu, X. (2017). Continuance intention on mobile social networking service: examine the effects of habit and gratifications.
[48] Olson, K. (2010). An examination of questionnaire evaluation by expert reviewers. Field methods, 22(4), 295-318.
[49] Ibrahim, T. M., Alarood, A. A., Chiroma, H., Al-garadi, M. A., Rana, N., Muhammad, A. N., ... & Gabralla, L. A. (2019). Recent advances in mobile touch screen security authentication methods: A systematic

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literature review. Computers & Security, 85, 1-24.
[50] Murray, T. J., Pipino, L. L., & Van Gigch, J. P. (1985). A pilot study of fuzzy set modification of Delphi. Human Systems Management, 5(1), 76-80.
[51] Kaufmann, A., & Gupta, M. M. (1988). Fuzzy mathematical models in engineering and management science. Elsevier Science Inc..
[52] Jamil, M. R. M., Hussin, Z., Noh, N. R. M., Sapar, A. A., & Alias, N. (2013). Application of Fuzzy Delphi Method in Educational Research. Design and Developmental Researc.
[53] Mutalib, M. R. A., Mohd Affandi, H., Mahmud, M. I., & Karim, S. K. A. (2018). Exploring the influencing factors towards Malaysian vocational college teachers' career choice. Vocational education & training–The world of work and teacher education, 315-336.
[54] Finstad, K. (2010). Response interpolation and scale sensitivity: Evidence against 5-point scales. Journal of usability studies, 5(3), 104-110.
[55] Sapar, A. A., Siraj, S., & Noh, N. R. M. (2014). Aplikasi teknik fuzzy delphi terhadap keperluan aspek 'riadhah ruhiyyah'untuk profesionalisme perguruan pendidikan Islam. The Online Journal of Islamic Education July, 2(2).
[56] Ghani, M. Z. A., Rahim, N. N., Ashaari, M. F., Rasit, R. M., Mohamad, A. D., & Mahmud, M. I. (2021). Analysis of Fuzzy Delphi Method on Preacher's Criteria of Thinking, Writing and Wasatiyyah Practice. International Journal of Innovation, Creativity and Change, 15(9), 368-389.
[57] Jamil, M. R. M., & Noh, N. M. (2020). Kepelbagaian metodologi dalam penyelidikan reka bentuk dan pembangunan. Shah Alam: Qaisar Prestige Resources.
[58] Chen, C. T. (2000). Extensions of the TOPSIS for group decision-making under fuzzy environment. Fuzzy sets and systems, 114(1), 1-9.
[59] Cheng, C. H., & Lin, Y. (2002). Evaluating the best main battle tank using fuzzy decision theory with linguistic criteria evaluation. European journal of operational research, 142(1), 174-186.
[60] Chu, H. C., & Hwang, G. J. (2008). A Delphi-based approach to developing expert systems with the cooperation of multiple experts. Expert systems with applications, 34(4), 2826-2840.
[61] Tang, C. W., & Wu, C. T. (2010). Obtaining a picture of undergraduate education quality: a voice from inside the university. Higher Education, 60, 269-286.
[62] Bodjanova, S. (2006). Median alpha-levels of a fuzzy number. Fuzzy sets and Systems, 157(7), 879-891.
[63] Von Der Gracht, H. A. (2012). Consensus measurement in Delphi studies: review and implications for future quality assurance. Technological forecasting and social change, 79(8), 1525-1536.
[64] LAWSHE, C. H. (1975). A quantitative approach to content validity. Personnel psychology, 28(4).

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