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SOCIAL MEDIA USAGE AS A FORMATIVE CONSTRUCT: CONCEPTUALIZATION, VALIDATION AND IMPLICATION

TAO HU
KING UNIVERSITY
thu@king.edu

PING ZHANG
MIDDLE TENNESSEE STATE UNIVERSITY
pzhang@mtsu.edu

ABSTRACT

Despite the calls for establishing theory-driven multidimensional formative conceptualization and operationalization of information systems (IS) usage, social media usage is conventionally modeled as a unidimensional reflective construct. Built on the conceptualization of IS usage and perspectives of the formative construction, this study develops an aggregate formative model of social media usage. The model conceptualizes and operationalizes social media usage as a multidimensional formative construct consisting of four behavioral dimensions. The model was validated using a large-scale cross-sectional field survey of social networking service users. The model contributes to IS research, and bears practical implications for promoting effective use and overall success of social media.

Keywords: information systems, social media, social networking services, formative construct, usage

INTRODUCTION

Social media (SM) build on the creation and exchange of user generated content to deliver a wide variety of online applications and services to meet people's social needs. Social media as a service platform in gaming, blogging, wikis, social shopping, and social networking services (SNS) has been viewed as the most exciting interactive interface on the Internet. By January 2015, 1.97 billion individuals are using social media around the world [49]. The wide use has galvanized organizations to embrace social media to reengineer business models and processes [53]. Nowadays, 80% of Fortune 500 companies are holding active accounts on Facebook and Twitter, and more than 63% of managers assert that SNS are important for business [4].

The unprecedented impact of social media on organizations and individuals has established one of the "hot topics" for the information systems (IS) research calling for the systematic investigations [33]. In this regard, our literature review shows that the large majority of the existing research has encompassed social media usage as a key component of the theoretical framework, and conventionally modeled the construct as a unidimensional reflective one; very few studies have provided rigorous multidimensional formative views of social media usage.

Meanwhile, the researchers of various business areas have long recognized the explanatory advantage of multidimensional formative constructs, and called for systematic research in this direction (e.g., [22, 31]). In the IS

area, scholars have realized the importance as well of establishing theory-driven multidimensional alternatives for the IS usage construct (e.g., [3, 10]). And, the conceptualization and operationalization of social media usage in the unidimensional reflective manner has been challenged [44].

Built on the conceptualization of IS usage and perspectives of the formative construction, this study takes into account the key interactive components of social media usage, and develops an aggregate formative model suggesting a set of behavioral dimensions that collectively and distinctively define the nature of social media usage. The study validated the model using a large-scale cross-sectional field survey of SNS users. The formative model contributes to IS research in theorizing and justifying the multiple measures of usage behavior of social media. For the business practice, appropriately measuring behavioral dimensions is essential to examine the antecedents and consequences of social media usage, and to evaluate the overall organizational success of social media [2, 34]. For managers, the model offers a meaningful metrics in understanding behaviors and effective use of social media.

The reminder of the paper is organized as follows. The next section provides a literature review of the conceptualization of IS usage in general and social media usage in particular, upon which the key interactive components of social media usage are explored, and an aggregate formative model is developed to specify social media usage as a multidimensional formative construct. The subsequent section reports data collection, instrument development, and data analysis testing the model with a large-scale cross-sectional field survey of SNS users. The last section discusses theoretical and practical implications, as well as limitations and avenues for future research.

LITERATURE REVIEW

Information Systems Usage

IS research has defined IS usage as a behavioral process in which human individuals use functions of an information technology (IT) artifact to perform goal-directed tasks [9]. In the use of IS, a set of human being and technological components interact with each other involving what entities, what functions of the IT artifact used, for what ends, and in what contexts [36]. As such, IS usage is conceptualized as a collection of "structurational" interactions of key components of the IT artifact, the user, personal/organizational tasks, and social contexts [43]. In the process, the user makes use of multiple features of the IT artifact to undertake different activities, and often plays varying roles cross various social contexts; and, the user's feeling and behavior exerts impact on the choice of IS functions [36].

The complex interactions of key usage components make IS usage a comprehensive flexible construct. IS usage should be constructed and interpreted in the sense of holistic multidimensional conceptualization and operationalization. A richly contextualized conception of IS usage is rather promising in capturing the composite set of usage behaviors and addressing interdependent nature and capabilities of IT artifact. Attempts in IS research have been made towards the direction, where multiple context-specific dimensions of IS usage were examined. Table 1 presents the selected representative studies modelling the multi-dimensions of IS usage in varying contexts.

Table 1**:** Selected Representative Studies in Multidimensional IS Usage

Literature	Conceptualization & Context	Operationalization
[3]	The set of usage behaviors users undertake in a specific task-technology context.	• Technology interaction: User use IS to solve problems and justify decisions. • Task-technology adaptation: Effort users spend in changing and modifying functionalities, interface, and hardware of the IS. • Individual adaptation: Communications users make with colleagues and specialists to adapt IS.
[10]	The use of one or more IS features to perform tasks.	• Cognitive absorption: Users' focused immersion in IS. • Deep structure usage: IS features that users use to support task performance. • Duration: Usage minutes that users spend on a specific case.
[23]	The use of IS in a work context to perform organizationally relevant functions.	• Problem solving: Users use IS to solve problems. • Decision rationalization: Users use IS to make decisions. • Horizontal integration: Users use IS for horizontal communications and coordination. • Vertical integration: Users use IS for vertical communications and management. • Customer service: Users use IS for customer services.
[51]	The use IS to perform organizational tasks.	• Number of messages users send. • Number of messages user receive. • Heavy, moderate, light, or nonuse of IS. • Number of IS features users use.

Social Media Usage

Yet, despite research calls for establishing theory-driven multidimensional conceptualization and operationalization of the IS usage construct, studies of this direction on social media usage are still rare. Our literature review consolidating findings of Cao et al. [11] and Ngai et al. [41] shows that, while the usage intention as the surrogate measurement to actual behavior of social media is still dominant, both surrogate and actual behavior are conventionally modeled as a unidimensional reflective construct; very few studies have provided systematic multidimensional formative views of social media usage. Table 2 presents a selected representative set of studies in social media usage.

The conceptualization and operationalization of social media usage in the unidimensional manner has offered insightful understandings of the ever pervasive phenomenon. The research stream, however, has been challenged due to, (1) the overlook of the conceptualization of IS usage as a collection of "structurational" interactions of key components of the IT artifact, the user, personal/organizational tasks, and social contexts [43]; (2) the possibly missing context-specific dimensions of the construct [10]; and (3) the possible missing of the predictive and explanatory power of the construct [22, 31, 44].

Research Objectives

The foregoing literature review identifies research gaps of the current social media research suggesting the objectives of this study: (1) to develop a formative model of social media usage as a multidimensional construct; (2) to empirically test the validity of the model; and (3) to discuss theoretical and practical implications of modeling social media usage as a multidimensional formative construct.

Table 2: Selected Representative Studies in Social Media Usage

Literature	Conceptualization & Context	Operationalization
[13]	The use of personal blogs to exchange knowledge.	• Visit blogs. • Leave feedback/comments. • Update blogs. • Share experience or knowledge. • Post documents or files.
[14]	The intention to switch to use alternative SNS websites.	• Consider switching. • High chance of switching. • Determined to switch.
[15]	SNS usage rate.	• Daily Use. • Frequency of access. • Level of regular log in.
[27]	Intentional participation.	• Intention to participate. • Intention to return.
[28]	The SNS use.	• Usage duration. • Usage frequency. • Usage intensity.
[29]	The intention to use.	• Likely to use. • Expect to use. • Intend to use.
[32]	The intention to continue using Facebook.	• Tendency to continuously use. • Recommend to friends. • Intend to get information.
[39]	The intention to act via SNS.	• Willing to check out. • Likely to act. • Likely to follow.
[56]	Usage patterns and activities of SNS.	• Weekly use • Usage duration. • Post something • View something • Share something • Reply to others • Play games.
[59]	Continuance intention to use social virtual world services.	• Intend to continue. • Expect to continue. • Would like to continue.

MODELING SOCIAL MEDIA USAGE AS A FORMATIVE MODEL

Capturing Categories of Social Media Usage

Because the social media phenomena are emerging, and the existing research is still lacking in addressing multidimensions of social media usage, we turn to the qualitative methods to explore the primary details of the phenomenon. Specifically, we chose to gather interview data to capture the context-specific attributes of social media usage from the detail-oriented narratives.

We performed 64 semi-structured interviews of randomly selected undergraduate and graduate students enrolled in two universities in North America. All participants have used SNS – the most popular application of social media – for at least one year. The interview focused on the interviewees' opinions about their usage of the SNS

they have used most often during the last three months. To facilitate the data collection procedure, the two researchers have conducted interviews, contrasted, and elaborated data interactively.

We followed the procedure established by Strauss and Corbin [52] to conduct data coding and content analysis. In the process, emerging categories of social media usage were defined, and conceptual dimensions were clarified and abstracted. As shown in Table 3, the iterative data collection, coding, and content analysis led to a set of key categories describing the interactive dimensions of social media usage.

Table 3: Categories of Social Media Usage

Sample Interview Text	Category
I use Facebook to look up old friends that I have not talked to or seen in years, to see where they are and what they are doing. *The SNS help me stay connected with relatives and friends, and help me stay in contact with former classmates.*	Staying connected with friends, colleagues, coworker, strangers, online avatars, etc.
I use the SNS to search information about people, events, news, and social activities. *Acquiring information from people is an excellent experience for me to use the SNS.*	Exchanging knowledge, information, and events.
I post a lot about my personal life and status in the SNS. *I kind of use social media to let people know what kind of person I am.*	Self-presenting interests, opinion, status, etc.
It is fun in Facebook to see everyone's pictures. I enjoy the feeling of being connected. *It is an entertaining experience. It is enjoyable to keep up with people.*	Entertaining fun enjoyable experience with social media.

Grounding in the interview data, we categorized the primary usage behaviors of social media into four types: (1) to maintain relationships, stay in touch, and keep connected with people; (2) to search and share information, events, and ideas with others; (3) to self-present interests, options, status, and events as interacting and socializing with people; and (4) to pursue fun experience as they interacted and socialized with people.

Developing a Typology of Social Media Usage

The preceding conceptualization of IS usage provides a theoretical background that underpins the conceptualization and the context-specific dimensions of social media usage. From the perspective, social media usage involves an integrative collection of Web2.0 technologies that maintains a variety of online services and applications for people to create and exchange user generated content. Its use covers various online activities that users perform to meet personal social needs in a voluntary setting. The conceptualization of social media usage in this fashion takes into account the overall interactions of IT artifact, goal-directed tasks, users, and social contexts. Integrating the foregoing literature review and the findings of the interview data, we propose a typology in Table 4 describing the underlying dimensions of social media usage.

- *Relationship Developing.* In the use of social media, people stay connected with each other, and are engaged in various social networking activities to develop relationships with families, friends, and even virtual avatars [13, 16, 27, 28, 32, 38, 54, 56, 59]. Thus, social media build virtual communities of tightly interconnected and emotionally close groups, and develop "mutual acquaintance and recognition" – a life sense of social interdependence, identities, and belongingness [40]. We thus propose relationship developing as the first dimension of social media usage.

Table 4: The Typology of Social Media Usage

Construct	Dimension	Description
Social media usage	Relationship developing	People use social media to develop relationship and stay connected with others.
	Information sharing	People use social media to search and share information, events, and ideas.
	Self-presenting	People use social media to present images, status, and events of themselves in a preferred manner.
	Entertaining	People use social media to pursue entertaining enjoyable experience in its own right.

- *Information Sharing.* Among the large pool of online contacts and contents, social media construct a rich source of information channels for users to search and share information, ideas, and social events [13, 27, 28, 54, 56]. Thanks to the high communicative connectivity, information flow in social media has expanded into "friends of friends and their friends" within their own network and virally spread to others' social circles [24]. Thus, we propose information sharing as the second dimension of social media usage.
- *Self-presenting.* In the social media world, people craft profiles and situations to present social status, events, and image of themselves in a preferred manner [35, 47, 48]. In Facebook, people take great pain on "wall posts" and "status updates" to create what they want others to see about themselves. In "tweets" and personal spaces of Twitter, people construct selective designs and positively biased content to foster their personal identity. People use the social media shows to articulate various cultural roles and contexts to present themselves as active virtual beings. We thus propose self-presenting as the third dimension of social media usage.
- *Entertaining.* Initially, social media were developed to satisfy people's needs for personal enjoyment and entertainment. The informational, relational, and self-presenting interactions in social media are embellished so well that people love to casually sneak into social media to seek entertaining enjoyable experience [27, 28, 29]. Because the social media shows and dramas are often hilarious and offer various fun activities, users can entertain themselves, and be very cognitively playful in the use of social media [38, 54, 56]. We thus propose entertaining as the fourth dimension of social media usage.

It should be noted that the proposed four dimensions are conceptually symbiotic and interrelated, and, as a group, jointly define the underlying nature of social media usage. Each of the dimensions is conceptually distinct from others, and defines a unique prominent aspect of the social media usage construct.

Firstly, the dimensions of relationship developing, information sharing, and self-presenting represent the utilitarian instrumental nature of social media usage in that people use social media to enhance their task performance for extrinsic social needs. The dimension of entertaining, on the other hand, reflects people's enjoyable entertaining experience representing the intrinsic distanced appreciation of social media usage activities [26].

Secondly, among the three utilitarian dimensions, self-presenting captures people's internal desire to present status, events, and image of themselves in a preferred manner [35], whereas the dimensions of relationship developing and information sharing reflect people's external social interactions with online contacts [28].

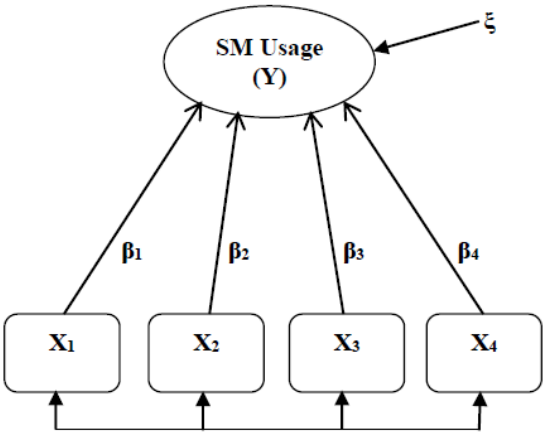
Thirdly, the dimension of relationship developing reflects people's use of social media in building interpersonal relationships with others, whereas information sharing represents people's searching and exchanging information and opportunities within heterogeneous groups of different practices [8].

Developing a Formative Model of Social Media Usage

The conceptualization of social media usage combined with the four behavioral dimensions suggests a promising theoretical basis for modeling social media usage as a formative construct.

Through the lens of the formative construction (i.e., [22, 31]), a formative construct is composed of mul-

tiple observable measurable indicators that define the nature of the construct. Conceptually, it is the combination of the variant indicators that describes the underlying properties of a formative construct. Building upon the rationale, we develop a formative model in Figure 1 specifying the multidimensions of social media (SM) usage. The model suggests that the four behavioral dimensions (X_1, X_2, X_3, and X_4) constitute the measurable indicators for the construct, social media usage (Y); each of them has a nonzero beta weight (β), and captures a unique non-interchangeable aspect of social media usage in relationship developing (X_1), information sharing (X_2), self-presenting (X_3) and entertaining (X_4). The combination of the four dimensions represents the content domain of social media usage, and determines the underlying context-specific nature of the construct.



$$\mathbf{Y = \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \xi}$$

Where,
Y: The formative construct, social media (SM) usage.
$\mathbf{X_n}$: The scores/observations for the measurement indicators - relationship developing (X_1), information sharing (X_2), self-presenting (X_3), and entertaining (X_4).
$\boldsymbol{\beta_n}$: The beta weights for the measurement indicators - relationship developing (β_1), information sharing (β_2), self-presenting (β_3), and entertaining (β_4).
ξ: The disturbance term.

Figure 1: The Formative Model of Social Media Usage

By the decision rules of Diamantopoulos and Winklhofer [22] and Jarvis et al. [31], social media usage as a formative construct displays the following measurement characteristics. Firstly, the direction of causality between the construct and the four observable indicators occurs from the indicators to the latent construct. This suggests that the construct be treated as formative in a higher-order model with the four behavioral dimensions at the lower-order level defining the characteristics of social media usage, where the behavioral changes at the dimensional level cause overall changes at the higher level, but not necessarily vice versa.

Secondly, because the four dimensions are conceptually distinct from each other, the interchangeability of the indicators is not expected. Dropping any of the dimensions from the formative model changes the overall domain of the construct. For example, the dimension of entertaining reflects the use of social media for intrinsic enjoyment, and has little to do with extrinsic social needs for relationship developing, information shearing and self-presenting [26, 28]. Following the same reasoning, the formative model suggests that the four behavioral dimensions do not share common themes, or have the same antecedents and consequences; and changes in any of the dimensions are not expected to cause changes in others.

VALIDATING THE FORMATIVE MODEL OF SOCIAL MEDIA USAGE

Sample and Data Collection

Social networking services (SNS) such as Facebook, Twitter, and LinkedIn are built on the collection of user profiles and the exchange of user generated content to maintain social networks in a voluntary setting. SNS are considered to be the most popular application of social media, and an excellent context for investigating social media usage. Back when the data collection effort was initiated, college students were considered to be the major SNS user population [37], we therefore conducted an online cross-sectional field survey of undergraduate and graduate students enrolled in two teaching universities in North America.

The field survey consists of questions with multi-item scales to capture the respondents' perceptions and opinions of the SNS use. The survey provided contextual information to ensure respondents complete it while thinking about the one SNS they have used most often during the last three months. Given the survey was conducted at the individual level, demographic data such as age, gender, ethnicity, and work status were collected along with the SNS websites that respondents had reported to use.

The response rate of the survey was 75.6% resulting in a total of 1013 acceptable datasets. The sample was nearly evenly divided by gender, relatively youthful in mix, and 27.7% worked fulltime. The sample is relatively similar to the demographics of the predominant SNS website, Facebook, during the same period of the study. The demographic statistics are reported in Table 5.

Table 5: Descriptive Statistics

Category	Value	Frequency	Percentage
Gender	Female	487	48.1%
	Male	526	51.9%
Ethnicity	White	711	70.2%
	African-American	154	15.2%
	Asian	97	9.6%
	Hispanic	26	2.6%
	Native American	3	0.3%
	Other	21	2.1%
Work Status	Not Working	732	72.3%
	Working Full Time	281	27.7%
Age Range	17 -20	245	24.2%
	21 -25	428	42.3%
	26 – 30	184	18.2%
	31 – 35	93	9.2%
	36-40	42	4.1%
	41-45	12	1.2%
	Above 45	8	0.8%
SNS Used	Facebook	601	59.3%
	YouTube	198	19.5%
	Twitter	67	6.6%
	Reddit	51	5.0%
	Instagram	27	2.7%
	LinkedIn	15	1.5%
	Pinterest	13	1.3%
	Flickr	11	1.1%
	Tumblr	11	1.1%
	Other	19	1.9%

Instrument Development

Basing upon the literature review of the existing social media research, and the qualitative data derived from the series of the interviews, we constructed the original measurement scales for the principal conducts. Appendix 1 shows the measurement scales and literature source of the constructs encompassed in this study. As shown, the measures were primarily adapted from previously validated scales of IS usage literature, and specified for the SNS context. The measures for relationship developing and information sharing were newly developed by the researchers following the standard procedures. (e.g., [6, 50]). All items were measured with the 7-point Likert-type scale (1 = Strongly Disagree to 7 = Strongly Agree).

The first round drafted instrument was administrated to three IS professors and five doctoral students for feedbacks. Based on their recommendations, the instrument was refined for wording clarification. A pilot study was conducted using 50 business school students on further refinement. The test on the reliability of the instrument was performed. The items that failed the reliability test or highly cross-loaded on other constructs were dropped. At the pilot study, the respondents were also asked to make note of the problematic survey items. Based on the feedbacks notes, changes were made mainly on the layout and phrasing of the survey questions.

For the multidimensional construct, social media usage, based on the construct conceptualization and the measurement guidelines outlined in Diamantopoulos and Winklhofer [22] and Javis et al. [31], this study operationalizes it as a second-order formative construct, and the four behavioral dimensions serve as the sub-construct indicators, and are modelled as the first-order reflective constructs. Following the practice of Rai et al. [46], we created linear composite scores from the measurement items of the sub-construct indicators and used them as the formative indicators for the second-order-formative construct. The finalized measurement of the formative construction is presented in Table 6.

Table 6: Principle Construct Measurement

Latent Construct	Type	Sub-construct indicator	Type	Measure
Social media usage	Second-order-formative	Relationship developing	First-order-reflective	Rel1: I use the SNS to stay in touch with people. Rel2: I use the SNS to maintain relationship with people. Rel3: I use the SNS to interact with people. Rel4: I use the SNS to Keep connected with people.
		Information sharing	First-order-reflective	Info1: I use the SNS to search and share information about people and social activities. Info2: I use the SNS to acquire and share information about people and social activities. Info3: I use the SNS to learn and share information about people and social activities. Info4: I use the SNS to gain and share information about people and social activities.
		Self-presenting	First-order-reflective	Self1: I use the SNS to establish a preferred image for myself. Self2: I use the SNS to present myself. Self3: I use the SNS to present a preferred impression about myself.
		Entertaining	First-order-reflective	En1: It is fun to use the SNS. En2: It is a lot of enjoyment to use the SNS. En3: It is exciting to use the SNS. En4: It is enjoyable to use the SNS.

Model Validation

Prior to assessing the formative model, we conducted detailed tests to examine potential common method bias with the dataset. We first applied Harman's one-factor test to determine whether common method bias is a concern. A principal component factor analysis was performed on the principal constructs, showing that five factors account for the covariance in hypothesized interdependent/dependent variables; each of them contributes to the explained variance, indicating no substantial common method bias with the dataset [45]. We then performed a partial correlation analysis, showing that the explained variance in an original model was not significantly different from the one with hypothesized control variables, also indicating no common method bias in the dataset. We thus concluded that the common method bias did not significantly affect the results of the study.

We used the structural equation modeling (SEM)-based approach (SmartPLS 2.0.M3) to analyze the field survey data for the estimation and validation of the formative model focusing on multicollinearity among measures, and content, construct and nomological validity [22, 31, 44].

Firstly, for this study, the content validity of the principle constructs was adequately assessed through the extensive literature review of the previously validated scales, the series of interviews and discussions with SNS users, and the pilot test of the measurement scales.

Secondly, we examined the bivariate correlations among the four first-order-reflective sub-construct indicators – relationship developing, information sharing, self-presenting, and entertaining – to assess the multicollinearity among them. As shown in Table 7, all the sub-construct indictors are highly significantly related to the second-order formative construct; the bivariate correlations among them range from 0.36 to 0.56 lower than the threshold of 0.64 [12], and the VIF was 1.44, lower than the threshold of 3.33 [21]. The estimates indicate no multicollinearity with the formative model. We thus concluded that there were no significant conceptual overlaps among the sub-construct indicators, and each of the behavioral dimensions contributes to a specific unique facet of the second-order formative construct.

Table 7: Correlations among Sub-Construct Indicators

Correlations among Sub-Construct Indicators					
	Self-presenting	Entertaining	Information sharing	Relationship developing	SM usage
Self-presenting	1.00				
Entertaining	0.48	1.00			
Information sharing	0.52	0.38	1.00		
Relationship developing	0.36	0.56	0.38	1.00	
SM usage	0.77	0.80	0.74	0.75	1.00

Thirdly, we assessed the construct validity of the formative construct through examining item weights for the sub-construct indicators. For this purpose, we created three additional reflective measures (Usage1, Usage2, and Usage3) for the social media usage construct by adapting previously validated scales from Hu et al. [28]. As Figure 2 shows, while the loadings for the three reflective measures are significant ($p < 0.001$), the weight coefficients for all first-order sub-construct indicators are significant ($p < 0.001$) ($\beta_1 = 0.32$; $\beta_2 = 0.32$; $\beta_3 = 0.33$; $\beta_4 = 0.34$), suggesting that the proposed behavioral dimensions of relationship developing (X_1), information sharing (X_2), self-presenting (X_3), and entertaining (X_4) contribute to the content domain of the social media usage construct.

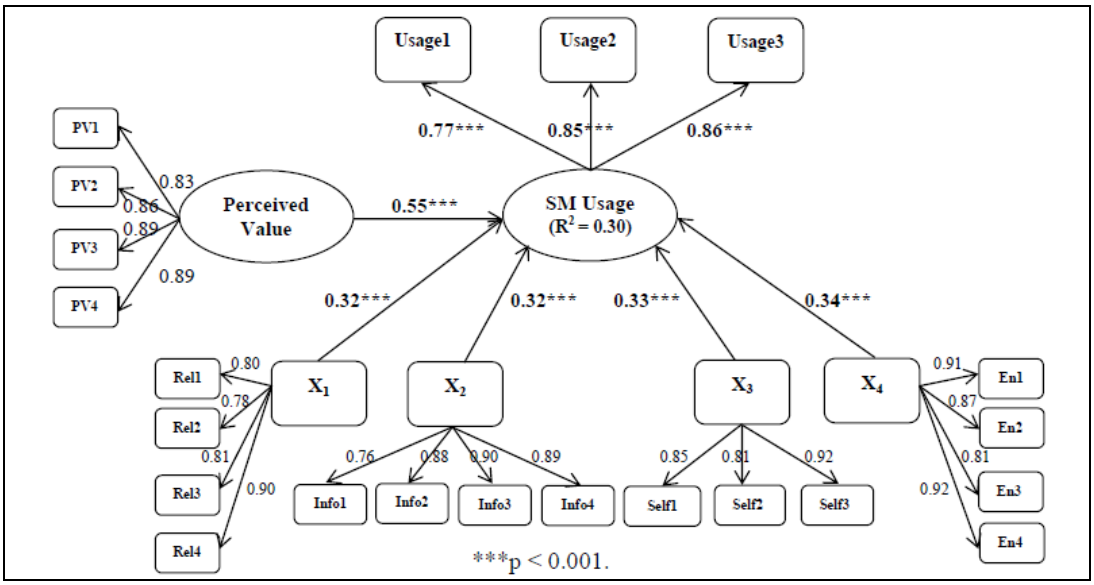


Figure 2: Results of the Second-Order Formative Construct

Fourthly, to validate the nomological validity of a formative model, Diamantopoulos and Winklhofer [22] recommends the formative construct be linked to at least one reflective construct (i.e., antecedents and/or consequences) and have the relationship tested between them. Following the guideline, we created the measures for an additional construct, perceived value of social media usage (Perceived Value), by adapting the previously validated scales from the service marketing literature (i.e., [5, 7, 57]). It was hypothesized that the perceived value of social media is positively associated with usage behavior. This relationship has gained considerable support in the literature of service marketing and IS usage (e.g., [5, 28]). The results in Figure 2 show that the hypothesized relationship is significant ($\beta = 0.55$, $p < 0.001$); perceived value explains 30% of the variance in social media usage. This supports the nomological validity of social media usage as a formative construct.

Finally, to assess the psychometric properties of the reflective measures of this study, we used the same SEM-based approach and conducted additional estimation and validation for the measurement model of the reflective constructs, showing the strong acceptable psychometric properties for the survey instrument. Refer to Appendix 2 for the estimation results.

DISCUSSION

Implications for Research

To address the complex interactions of the key IS usage components, IS researchers have long called for the theory-driven multidimensional alternatives for the IS usage construct (e.g., [10, 44]). In this study, we responded to the call, and developed an aggregate formative model to describe the multidimensional nature of social media usage. This study contributes to IS research in the following aspects.

Theory-Driven Conceptualization of Social Media Usage

Built upon the general conceptualization of IS usage and the perspective of the formative construction, this study conceptualizes social media usage as a composite set of behaviors that individuals undertake in using the bundle of social media applications. The conceptualization was specified with the interview dataset capturing social media usage as a function of a variety of online activities that users perform to accomplish relational, informational, entertaining, and self-expressing tasks in varying usage contexts.

As has been widely confirmed in various research contexts, a formative model specifies the multidimensional nature of a construct more appropriately than

the models otherwise constructed [44]. While the multidimensional conceptualization of social media usage has yet to develop for the accumulating IS usage literature, the proposed formative model of this study represents the first attempt in the literature. The proposed dimensions of usage-related behaviors shall help IS researchers to develop a full domain and context-specific measures of the social media usage construct.

Operationalization and Validation of the Formative Construct, Social Media Usage

The perspective of the formative construction indicates that, for specific research questions, a formative model shall assume greater predictive and explanatory power over the reflective ones [22, 44]. In this study, we operationalized social media usage as a second-order formative construct. The model assumes convincing validity and strong psychometric properties, and shall enhance future investigations of social media usage regarding what behaviors are involved, and the extent to which the behavior is undertaken. Combined with the overarching conceptualization, this shall contribute to the meaningful evolving findings about the nomological relationships between social media usage and its antecedents and consequences in various contexts.

Implications for Practice

The formative model proposed and tested in the study provides practical guidelines for social media organizations and managers to leverage usage behaviors and promote effective use of social media. Firstly, the findings of this study suggest that managers and designers focus on delivering and promoting major usage functions of social media such as relationship developing, information sharing, self-presenting, and entertaining.

Secondly, the multidimensional formative measures facilitates managers to identify key behavioral factors of social media usage – how people use specific applications at what levels for what purposes, and what usage behavior matters most. Understandings of these aspects shall particularly assist managers to build effective applications and services to retain a critical mass of users for the overall success of social media [2].

Thirdly, IS use exercises downstream impact on individual and organizational performance [19, 20]. As companies and organizations are adopting social media to reengineer business processes and models, users' effective use of social media has been considered to be the major determinant for the success of the social media organizations [34]. The theory-driven measures of this study offer meaningful metrics in investigating the patterns and extent of social media usage. Understandings of this regard are of great importance for social media organizations to develop long-term strategies for business survival and marketing extension.

Limitations and Future Research

This study has limitations in some respects, which should be addressed in future research. Firstly, we drew upon the conceptualization of IS usage, and literature review and qualitative data along with the perspective of the formative construction to develop the formative model of social media usage. Although this is consistent with the guidelines for developing formative constructs (e.g., [22, 31]), a deeper understanding of the multidimensional nature of social media usage may benefit from further theoretical and literature refinement. This shall ensure the full formative domain of the construct. For example, the salience and meaningfulness of incorporating usage costs into social media usage may be considered in future research [14, 28, 58]. We urge researchers to consult theories and literature to achieve a more integrated understanding of social media usage.

Secondly, this study conceptualizes and operationalizes social media usage as a formative construct. The formative model shall assume methodological advantage over a reflective one in describing the nature and dimensions of social media usage [22, 31, 44]. However, because operationalizing a construct with a strong reflective or formative perspective may introduce measurement biases [18], this suggests one useful direction for improving the operationalization of the social media usage construct. For further research, improved procedures for operationalizing the formative indicators should be considered.

CONCLUSION

In response to the research call for establishing theory-driven multidimensional conceptualization and operationalization of IS usage, this study develops a formative model specifying social media usage as an aggregate formative construct with four behavioral dimensions. Following the established procedures of the formative construction, the study validated the model showing the sufficient empirical support. As the most significant impact and implications of social media for individuals and organizations are still to come, the research of this direction shall shed light on IS usage research, and promote effective use and overall success of social media.

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AUTHOR BIOGRAPHIES

Tao Hu is currently an Associate Professor of Information Systems at School of Communication, Information & Design of King University (Bristol, TN). Dr. Hu has served as an invited professor at School of Business Administration of Qingdao Binhai University (Qingdao, China). Dr. Hu received Master's and Ph.D. in Business Administration from The Fogelman College of Business & Economics of The University of Memphis (Memphis, TN). Dr. Hu's research focuses on such areas as cybersecurity, business analytics & intelligence, and value-based strategies of online services and social media.

Ping Zhang is currently an Associate Professor of Statistics at The College of Basic and Applied Sciences of The Middle Tennessee State University (Murfreesboro, TN). Dr. Zhang received Master's and Ph.D. in Statistics from The University of Memphis (Memphis, TN). Dr. Zhang's research focuses on such areas as experimental design, business statistics, and categorical data analysis.

APPENDIX 1

Table A-1: Measurement Scales and Literature Source

Construct	Measures	Literature source
Entertaining	En1: It is fun to use the SNS. En2: It is a lot of enjoyment to use the SNS. En3: It is exciting to use the SNS. En4: It is entertaining to use the SNS.	[1, 55]
Information sharing	Info1: I use the SNS to search and share information about people and social activities. Info2: I use the SNS to acquire and share information from people and social activities. Info3: I use the SNS to learn and share information about people and social activities. Info4: I use the SNS to gain and share information about people and social activities.	[8, 24]
Perceived value	PV1: The value I receive from the SNS is very high even given the costs for its use. PV2: Even given the costs for its use, the SNS satisfies my needs very well. PV3: The benefit that I receive from the SNS is very high compared to the costs for its use. PV4: Even compared to the costs for its use, my use of the SNS is very worthwhile.	[5, 7, 57]
Relationship developing	Rel1: I use the SNS to stay in touch with people. Rel2: I use the SNS to maintain relationships with people. Rel3: I use the SNS to interact with people. Rel4: I use the SNS to Keep connected with people.	[8, 24, 40]
Self-presenting	Self1: I use the SNS to establish a preferred image for myself. Self2: I use the SNS to present myself. Self3: I use the SNS to present a preferred impression about myself.	[35]
Social media usage (Reflective)	Usage1: On average, how many minutes each day do you use the SNS? 0-5 minutes, 5-15 minutes, 15-30 minutes, 31-60 minutes, 1-2 hours, 2-3 hours, More than 3 hours. Usage2: How often do you use the SNS? Less Than Once a Day Many Times Each Day 1 2 3 4 5 6 7 Usage3: How do you consider the extent of your use of this OSNS? No Use at all Very Heavy Use 1 2 3 4 5 6 7	[28]

APPENDIX 2: ASSESSING THE MEASUREMENT MODEL OF REFLECTIVE CONSTRUCTS

To assess the psychometric properties of the reflective constructs encompassed in the study, we performed a confirmatory factor analysis using the SEM-based approach to validate convergent and discriminant validity of the reflective measures.

Firstly, Table A2-1 reports the value of composite reliability (CR) and the square root of average variance extracted (AVE). The estimates show that each reflective construct is sufficiently different from the others. For each of the reflective constructs, CR >= 0.87, and the square root of AVE >= 0.83, suggesting the construct reliability exceeds the threshold criterion of CR >= 0.70, and the square root of AVE >= 0.70 [25, 42]. Additionally, the square roots of all AVEs are above 0.70 in Table A2-1, which are greater than all cross-correlations [17].

Secondly, the analysis tested convergent and discriminant validity of reflective constructs. As show in Table A2-1, the measurement scales used in this study meet the criteria for convergent and discriminant validity of the reflective constructs.

Thirdly, the convergent and discriminant validity of the reflective constructs can be further verified when the indicators load higher on their hypothesized construct than others [17]. Table A2-2 reports the factor loadings for each latent reflective variable. As shown, the loadings of each item on their respective construct are much higher than those cross-loading on other constructs.

Thus, the reflective measures of the study exhibit strong psychometric properties of internal consistency reliability and content, convergent and discriminant validity.

Table A2-1: Reliability and Variance among Reflective Constructs

	AVE	CR	Cronbachs α	Entertaining	Information sharing	Relationship developing	Self-presenting	SM usage*	Perceived value
Entertaining	**0.77**	**0.93**	**0.90**	**0.88**					
Information sharing	**0.74**	**0.92**	**0.88**	0.38	**0.86**				
Relationship developing	**0.68**	**0.90**	**0.84**	0.56	0.37	**0.83**			
Self-presenting	**0.74**	**0.90**	**0.83**	0.47	0.53	0.36	**0.86**		
SM usage*	**0.69**	**0.87**	**0.78**	0.54	0.21	0.31	0.32	**0.83**	
Perceived value	**0.75**	**0.92**	**0.89**	0.48	0.38	0.45	0.38	0.33	**0.87**

Note:
*: SM usage as an alternative first-order-reflective construct.
AVE = Average Variance Extracted; CR = Composite Reliability.

Table A2-2: Factor Loading for the Measurement Model of Reflective Constructs

	Entertaining	Information sharing	Relationship developming	Self-presenting	SM usage*	Perceived value
En1	**0.91**	0.32	0.54	0.37	0.50	0.48
En2	**0.87**	0.36	0.51	0.45	0.45	0.40
En3	**0.81**	0.32	0.39	0.46	0.43	0.31
En4	**0.92**	0.35	0.52	0.41	0.53	0.47
Info1	0.33	**0.76**	0.32	0.47	0.19	0.28
Info2	0.31	**0.88**	0.33	0.46	0.17	0.34
Info3	0.33	**0.90**	0.33	0.46	0.16	0.35
Info4	0.34	**0.89**	0.30	0.44	0.19	0.32
Rel1	0.44	0.27	**0.80**	0.23	0.22	0.36
Rel2	0.41	0.27	**0.78**	0.29	0.23	0.36
Rel3	0.51	0.32	**0.81**	0.37	0.35	0.36
Rel4	0.50	0.37	**0.90**	0.31	0.24	0.40
Self1	0.41	0.51	0.34	**0.85**	0.28	0.37
Self2	0.34	0.38	0.27	**0.81**	0.26	0.24
Self3	0.45	0.46	0.32	**0.92**	0.28	0.34
Usage1	0.41	0.09	0.25	0.16	**0.77**	0.19
Usage2	0.43	0.13	0.20	0.21	**0.85**	0.27
Usage3	0.51	0.25	0.31	0.38	**0.86**	0.32
PV1	0.36	0.29	0.33	0.29	0.23	**0.83**
PV2	0.42	0.31	0.41	0.27	0.30	**0.86**
PV3	0.44	0.33	0.39	0.36	0.30	**0.89**
PV4	0.45	0.37	0.41	0.37	0.30	**0.89**

Note:
*SM Usage as an alternative first-order-reflective construct.