

Developing and Validating an Instrument for Social Content Management

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Abstract— Social content is important for successful innovation of services. To successfully leverage the value of social content, they need to be properly managed. To achieve this, factors that contribute to social content management must be identified and subsequently validated. In this article, eleven factors that impact upon social content management are highlighted. Taking into consideration the fact that social content management is still an evolving field of study, validation of these factors was done by employing the Delphi technique. Research had indicated that there are several different versions of the Delphi technique, and some researchers have criticized the method as non-rigorous. Thus, in this paper, it is highlighted that this issue could be tackled if the questionnaire instrument used to assess the expert's opinion is developed by adhering to a rigid protocol. Embedded in this rigid protocol, are two measures of validity used which are the content validity ratio (CVR), and the mean of CVR, namely the content validity index (CVI). A total of 86 items are submitted for evaluation and based on the CVR value and comments from the content evaluation panel members, all items are acceptable, with minimal adjustments. The CVI measure returned a value of 0.99, which shows that the factors and the whole questionnaire are accepted. The questionnaire with the validated content could be used as an instrument to validate the factors that are affecting the management of social content. It is hoped that the factors would assist the organization in managing the social content effectively.

Keywords— content validity; instrument development protocol; social content management; social media.

I. INTRODUCTION

Social content which arises from social interactions via social networking platforms provides the added value needed to develop service innovations. Research by [1] and [2] stated that social content would become a source of information compared to conventional media in political participation. Social content could also lead to more effective customer engagement and thus, social media could change the way of doing business [3]. However, in order to realize the value that are inherently available in the social content, suitable social content management models or frameworks need to be developed.

Social content needs to be managed properly [4]. It is because without proper understanding about the factors for managing social content, organizations would face a certain amount of difficulty to generate accurate results based on input from social content. However, the literature has shown that there is a lack of academic research concerning the area of social content management [5], [6]. Research done by [7]

revealed that the conceptual aspects of social content management were given less attention as compared to the technological aspect.

Further reviews of the literature showed that the focus of existing frameworks on social content management models or frameworks fail to consider the main attribute of social media interactions, that of value-co-creation. These existing models and frameworks focused more on the value of the social content to organizations [5], [6], [8], and chose not to emphasize on the co-created value [9]. The existing framework also places less emphasis on the production of service innovations based on managed social content [8], [10]. Besides that, research by [11] also indicates that organizations were focused more on the quality of social content from the technical aspects than the quality of content that meets the needs of customers. Thus, in order to address the shortcomings of the current models and frameworks, it is proposed that the service science approach is used as a basis for the identification of the factors in managing social content. Service science is an approach that puts value co-

creation as the core principle for innovation. The approach is important and becomes the solution of this study because service science emphasized collaboration between organizations and customers that considers the value for both sides, namely the value co-creation to create service innovations [12], [13].

The results of this deliberations were presented in details in previous research [14]. The factors obtained were participation, strategic implication, operant resource, operand resource, integration, content lifecycle, service platform, strategy, governance, strategic managerial aspect, and service ecosystem. The summary of description of each factor are given in Table I.

TABLE I
DESCRIPTION OF FACTORS FOR MANAGING SOCIAL CONTENT FROM SERVICE SCIENCE APPROACH [14]

Factor	Description
Participation	The engagement and human resource involvement in managing social content
Strategic implication	The principal outcome from the actor participation
Operant resource	A dynamic resource to increase the level of competitiveness
Operand resource	A static resource such as technology, manpower, and budget
Integration	The relationship between various resources involved
Content lifecycle	The process of the lifecycle of content that supports the value co-creation which is start from capturing until maintaining the content
Service platform	The interaction space to improve service exchange capability
Strategy	The plans, steps and methods for the management of social content
Governance	The administrative routine in managing social content
Strategic managerial aspect	The actors' acceptance of changes in technology, administration and methods in managing social content, and the raised of competency levels of actors involved
Service ecosystem	A holistic context that allows the process of value co-creation to take place in the management of social content

The factors presented in Table I need to be validated before it could be molded into a social content management model or framework. In order to do this, since the domain of social content management and that of service science are still evolving, it is decided that validation through expert groups using the Delphi technique is a better option. Delphi technique is a suitable technique for validating the framework [15], and the questionnaire is a common instrument that is used in administering the Delphi technique [16]. Hence, in this paper we would explain the process that should be followed and the measures of validity that could be used for the development of the questionnaire as an instrument for expert evaluation through the Delphi technique via a rigid protocol. As proposed by past researchers, there are several methods that could be used to measure the content validity either via qualitative or

quantitative analysis [17]–[19]. The summary of methods for content validity is as in Table II.

TABLE II
METHODS OF CONTENT VALIDITY [17]–[19]

Method for content validity	Description
Qualitative analysis	
Intensive literature review	Measure the constructs based on past studies and relies on the existing instrument, without expert's assessment.
Experts assessment.	Conducted by analyzing the comments and feedback submitted by the experts on the proposed items in the instrument. Experts are individuals whom are eligible to express their perspectives on the required content
Quantitative analysis	
Content Validity Ratio (CVR) [20]	The instrument is examined by a group of experts namely the content evaluation panel member. The CVR uses a three-point scale to assess the items developed in the questionnaire. The scale is "1=not necessary", "2=useful (but not essential)", and "3=essential". A comment section is provided to allow experts to state their opinion on every item in the questionnaire, and indicates their judgement on the entire questionnaire. There is an acceptance value provided to guide the researcher to accept or reject the item.
Index of content validity [21]	The instrument is examined by a group of experts. Index of content validity uses four-point scale to assess the items developed in the questionnaire.

A quantitative analysis is adopted in this study since content validity using qualitative analysis may lead to some difficulty in interpreting many questionnaire items [22]. In a Delphi technique, past researches usually focused on the analysis of the response from the experts and not on the process and validity of the instrument used to assess the experts' opinions. Studies like [23] used quantitative analysis to determine content validity of the instrument. In [23], they used a measure called the index of content validity introduced by [21].

Meanwhile, the CVR introduced by [20] is a suitable method for validating the content in the instrument. It is a better option compared to the method introduced by [21] (namely the index of content validity) as the scale used in the method is not universal [22]. The scale used in index of content validity are "1 = irrelevant", "2 = somewhat relevant", "3 = quite relevant", and "4 = highly relevant". Content validity index (CVi) is also conducted as proposed by [20] to show the importance of the factors and the whole instrument. CVi is different from the index of content

validity by [21] because CVi from [20] is the calculation of the mean of all accepted items in CVR. Therefore, this study applies combinations of the calculation of CVR and CVi value proposed by [20] for the content validity of the questionnaire.

II. MATERIALS AND METHODS

The step in developing the questionnaire by adhering to a rigid protocol was adapted from [18]. Based on [18], there are four processes which were used to develop the questionnaire, namely (1) planning and strategy, (2) define the content, (3) design questionnaire, and (4) validity of the questionnaire. Besides that, the processes are supported by are eight steps that suit with each process. This study uses all four processes proposed by [18], with the selection and simplification of six steps to develop the instrument of the study as in Fig. 1.

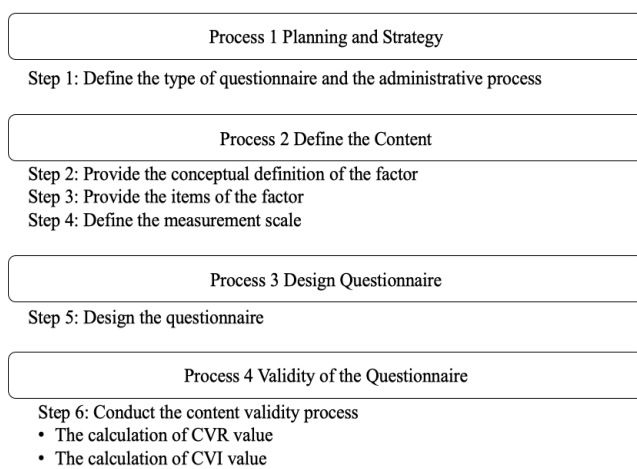


Fig. 1 Steps for questionnaire development

The process is explained in detail in the next section namely Results and Discussion to illustrate the results of the

study as the main finding is the development of the instrument to verify the factors of social content management based on a rigid protocol.

III. RESULTS AND DISCUSSION

The results of this study are presented in the sequence of the steps depicted in Fig. 1 as stated in Materials and Methods section.

A. Step 1: Define the type of questionnaire and the administrative process

This study used a structured questionnaire as the researchers could effectively administer it.

B. Step 2: Provides the conceptual definition of the factor

As stated in the Introduction, factors for managing social content are participation, strategic implication, operant resource, operand resource, integration, content lifecycle, service platform, strategy, governance, strategic managerial aspect, and service ecosystem. The definition of the factors is discussed in details in [14]. Besides that, to provide an overview and general understanding, the description of the factors is summarized in Table I.

C. Step 3: Provide the items of the factor

The items in the questionnaire are formed based on the insight from the review and adopted the approach of the questionnaire construction as recommended by [22]. The items are derived from the Service-Dominant Logic [12] and the DART model [24], [25], as well as from the past studies in the content management domain. A generic item is also designed for each factor to gauge the importance of factors in managing social content. Therefore, there are 86 items developed in the questionnaire and the cluster of items for the questionnaire is stated in Table III.

TABLE III
CLUSTER OF ITEMS FOR QUESTIONNAIRE

Factor	Item Code	Cluster of items	Highlight of the items
Participation	1.A1-1 - 1.A1-6	Involvement of top management in the organizations	<ul style="list-style-type: none"> Strategic thinker in the management of social content which include formulating the corporate strategy and certain policies coincides with the management of social content Decision maker for service innovation where the input is from the managed social content Governance pusher such as determining the human resources, content assets, and other possible resource (such as manpower requirements, budget)
	2.A1-7 - 2.A1-10	Involvement of tactical level of management in the organizations	<ul style="list-style-type: none"> Implementer for the corporate strategy and policy Controller of the governance High level manager of social content management namely in analyzing and maintaining the social content from the content lifecycle
	3.A1-11 - 3.A1-12	Involvement of the operational level of management in the organizations	Front liner of social content management namely in capturing and managing social content in the content lifecycle
	4.A1-13 - 4.A1-15	Involvement of both organizations and the customers	<ul style="list-style-type: none"> Actively use the designated technology Involved with the change management program as prescribed
	5.A1-16 - 5.A1-18	Engagement of the organizations with the customers	<ul style="list-style-type: none"> Be socialize Be collaborate to create opportunities for innovation and value co-creation for all actors involve

	6.	Generic item for participation	
Strategic implication	7.A2-1 - 7.A2-5	Strategic implication resulted from the participation of all actors	<ul style="list-style-type: none"> Trade off from value co-creation process whereby, organizations only suggest value to customers, and customers determine the actual value based on their needs Creating opportunities for service innovation to the organizations Increasing the customer level of trust
	8.	Generic item for strategic implication	
Operant resource	9.B1-1 - 9.B1-5	The need of dynamic resource such as skills, capabilities, and knowledge	The dynamic resource needed in formulate corporate strategies, managing social content, managing operand resource, and soft skill in engaging customer
	10.	Generic item for operant resource	
Operand resource	11.B2-1 - 11.B2-6	The need of static resource	The static resource needed especially in the aspect of technology, hardware, software, repository, budget, and manpower
	12.	Generic item for operand resource	
Integration	13.B3-1 - 13.B3-3	The need of integration of all resources	Integration of resources especially in the context of integration with all resources involved either operand or operant resource
	14	Generic item for integration	
Content lifecycle	15.C1-1 - 15.C1-3	The importance of content lifecycle	<ul style="list-style-type: none"> Involves the full process of content lifecycle Provide mechanism to identify the opportunities for service innovation based on the managed social content
	16.C1-4 - 16.C1-7	The process towards providing service innovation from the managed social content	Detailing the process of content lifecycle namely, capturing social content through interaction, managing social content, analysis of social content for service innovation, and maintaining the transparent social content
	17.	Generic item for content lifecycle	
Service platform	18.C2-1 - 18.C2-3	The need for service platform	<ul style="list-style-type: none"> Fast system with friendly user interface Facilitates relationships between different content categories
	19.	Generic item for service platform	
Strategy	20.D1-1 - 20.D1-6	The segments for strategy for managing social content	The segments of strategy that emphasize on actor-driven, content-driven, process-driven, technology-driven, mechanisms for managing social content, and change management program
	21.D1-7 - 21.D1-11	The value gained from the strategy	The value of the strategy in managing social content namely effectively manage the social content and reduce challenges
	22.	Generic item for strategy	
Governance	23.D2-1 - 23.D2-4	The importance of governance	Compliance to the existing policies, has specific policies, as well as embark on a proper management structure and has specific role on all resources involve in social content management
	24.	Generic item for governance	
Strategic managerial aspect	25.D3-1 - 25.D3-2	The components of strategic managerial aspect	The need of commitment and change management program
	26.D3-3 - 26.D3-4	Gain commitment from top management	The need to gain commitment from top management
	27.D3-5 - 27.D3-7	Proper change management program	The need to have a proper change management program
	28.	Generic item for strategic managerial aspect	
Service ecosystem	29.E1-1 - 29.E1-6	The components of service ecosystem	The holistic ecosystem in managing social content
	30.	Generic item service ecosystem	

D. Step 4: Define the Measurement Scale

Based on [26], Likert scale of five is commonly applied in the questionnaire for the Delphi technique. Therefore, this study applies Likert scale of five for the questionnaire for Delphi technique, which are "1 = Strongly Disagree", "2 = Disagree", "3 = Partially Agree", "4 = Agree", and "5 = Strongly Agree".

E. Step 5: Design the questionnaire

The approach by [27] is adopted in compiling the items for the questionnaire. The questionnaire does not involve sensitive issues and would not give burden to the experts.

F. Step 6: Conduct the content validity process

As mentioned in Introduction, for content validity, this study applied the method introduced by [20] that uses the Likert scale of three to validate the content namely the items developed in the questionnaire. The scale is "1=not necessary", "2=useful (but not essential)", and "3=essential". This study adopted the steps for content validity process as proposed by [22] as follows:

1) *Select a content evaluation panel member:* This study formed a content evaluation panel member to evaluate the validity of the content in the questionnaire. In terms of the number of the members, no fixed amount was suggested by previous researchers. [20] suggested a total of four members, while [28] suggested eight to 16 members. In this study, eight members are chosen based on the knowledge and expertise in the domain namely content management, service science, and statistics as in Table IV.

TABLE IV
CONTENT EVALUATION PANEL MEMBERS

Position	Years of experience	Experience
Content management		
ICT Officer and Ph.D. candidate in record management field	13 years	Has publications in document and records management
ICT Experts in the domain of content management	13 years	Involved with information and content management, and ICT strategic management projects
Lecturer in the faculty of document management	10 years	Experienced in document, content (including social content), and records management
Public Relation Officer	13 years	Experienced in managing the organisation's social media accounts
Service science		
Lecturer and Ph.D. candidate in service science field	5 years	Members of the science service research group and has publications in service science
Director of Computing Technology Department	25 years	Earned a doctorate in service science field and has publications in service science

Senior Lecturer	25 years	Members of the science service research group and has publications in service science
Service science and statistics		
Senior Lecturer	25 years	Members of the science service research group, has publications in service science, and an expert in statistics

2) *Issue invitation to the content evaluation panel and distribute items:* The members are invited via email which includes the questionnaire and approval form. Each member is asked to read the items and marked the answer in the space provided. Each member is also being asked to return the questionnaire that has been answered within a specified period.

3) *Analyze the responses:* The analysis of the response is based on the calculation of CVR, CV_i, and comments. The formula of CVR is as follows:

- CVR formula [20]

$$CVR = (2N_e / N) - 1 \tag{1}$$

where, "N_e" is the number of content evaluation panel members that respond "3=essential"

"N" is the total number of content evaluation panel members

The CVR is calculated for all items namely, the specific items and the generic item for each factor. Research by [20] consider the relevant item by the answer of "3=essential" from the content evaluation panel members as explained in Fig 2,

- If everyone of the content evaluation panel members indicated the answer "3 = essential", then, the CVR value is 1.00 (all agreed).
- If more than half (> 50%), but less than everyone (< 100%) of the content evaluation panel members indicated the answer "3 = essential", then, the CVR value is positive, ranging between 0.00 to 0.99.
- If less than half (< 50%) of the content evaluation panel members indicated the answer "3 = essential", then, the CVR value is negative.

Fig. 2 CVR calculation

However, based on [22], the answers "2=useful (but not essential)" are also relevant while "1=not necessary" are irrelevant. Therefore, this study calculates the relevant item by considering the answer of "2=useful (but not essential)" and "3=essential" from the content evaluation panel members. This study also follows the acceptance criteria set by [20], which is the minimum acceptable CVR value in order to accept the items. The value is based on the number of content evaluation panel members as in Table V.

TABLE V
MINIMUM CVR VALUE COMPARED TO THE NUMBER OF CONTENT
EVALUATION PANEL MEMBERS [20]

No. of panelist	Minimum value
5	.99
6	.99
7	.99
8	.75
9	.78
10	.62
11	.59
12	.56
13	.54
14	.51
15	.49
20	.42
25	.37
30	.33
35	.31
40	.29

Considering that members of content evaluation panel in this study are eight (refer Table IV), therefore, according to Table V, each item that received the CVR value of 0.75 and above should be accepted. All items that received the minimum value would be retained in the final questionnaire for Delphi Technique Round 1.

As mentioned in the Introduction section, CVi is also calculated to determine the level of validity of factors and the whole instrument [28]. CVi value is the mean of CVR value of the remaining items and conducted to compute the entire test. The formula of CVi (mean of CVR) based on [20] and [28] is as follows:

- CVi formula

$$CVi(\text{mean of CVR}) = \frac{\sum_n CVR}{\text{Retained number}} \quad (2)$$

where,

“Retained number” is the “accepted” items based on the CVR minimum value

According to [28], the closer the CVi (mean of CVR) value to 0.99, the value of content validity of the factor and the whole instrument is higher. The example of the calculation of CVR and CVi for one factor namely the Service Ecosystem is in Table VI.

TABLE VI
EXAMPLE OF CVR AND CVI CALCULATION FOR SERVICE ECOSYSTEM

Item No.	Panelist No								Relevant Answer =2 and 3	CVR Value
	1	2	3	4	5	6	7	8		
E1 – SERVICE ECOSYSTEM										
29. E1-1	3	3	3	3	2	3	2	3	8	1
29. E1-2	3	3	3	3	2	3	3	3	8	1
29. E1-3	3	3	3	3	2	3	2	3	8	1
29. E1-4	3	3	3	3	2	3	3	3	8	1
29. E1-5	3	3	3	3	2	3	3	3	8	1
29. E1-6	3	3	3	3	2	3	3	3	8	1
30. (Generic)	3	3	3	3	2	3	3	3	8	1
CVi (mean of CVR) for Service Ecosystem										1
<i>Result: All items in Service Ecosystem are accepted because all items received the CVR value of 0.75 and above (Refer Table V)</i>										

while the results of the CVR value and CVi (mean of CVR) for the whole instrument is in Table VII.

TABLE VII
CVR AND CVI VALUE FOR MANAGING SOCIAL CONTENT

Factor	CVR value		No. of Items	CVi (mean of CVR) value per factor
	Individual	Generic		
Participation	All items=1.00 except 1.A1-4=0.75	1.00	19	0.99
Strategic Implication	All items=1.00 except 7.A2-1 and 7.A2-2=0.75	1.00	6	0.90
Operant resource	All items=1.00	1.00	6	1
Operand resource	All items=1.00	1.00	7	1
Integration	All items=1.00	1.00	4	1
Content lifecycle	All items=1.00	1.00	8	1
Service platform	All items=1.00	1.00	4	1
Strategy	All items=1.00	1.00	12	1
Governance	All items=1.00	1.00	5	1
Strategic managerial aspect	All items=1.00	1.00	8	1
Service ecosystem	All items=1.00	1.00	7	1
			Total item=86	CVi value total: 0.99

4) *Revise and finalize the item and questionnaire:* According to the content validity process, items and questionnaire are finalized for the use of the Delphi Technique Round 1. Based on Table VII, all individual items received the CVR value of 1.00, except for three items namely 1.A1-4, 7.A2-1, and 7.A2-2, which received the value of 0.75. Item 1.A1-4 states “the involvement of top management is necessary to give full commitment while managing social content”, item 7.A2-1 states “the organizations only suggest value to customers”, and item 7.A2-2 states “the freedom of expression to the customer namely customers determine the actual value based on their needs”. However, all items are accepted as the minimum value is met, namely the CVR value of 0.75. The generic item also received the CVR value of 1.00. Thus, this indicates the importance of the identified factors.

In terms of CVi (mean of CVR) value, all factors received the value of 1.00 except participation and strategic implication (refer Table VII). However, the value is towards 0.99 which reflect the importance of the factor. This supports the CVR computation on the generic item of each factor that indicates the suitability of item measured for managing social content. For the whole instrument, the CVi (mean of CVR) value is 0.99. It shows the validity of the content of the entire instrument.

As a summary, all items in the questionnaire are accepted during the content validity process and would be administered in round 1 of the Delphi technique. It means, the validated instrument would be used as a final questionnaire in Delphi technique round 1.

IV. CONCLUSIONS

The instrument, namely a questionnaire is developed to evaluate the factors for managing social content. The developed questionnaire has 86 items, consist of the individual item for each factor, and generic item that reflects the importance of factor. Based on the CVR value obtained for the individual item, all items are accepted as all items received the CVR value of 0.75 and above. Besides, for the CVR value for the generic item, each factor is agreed upon by the content evaluation panel members. For the calculation of CVi (mean of CVR) value for the factor, it shows the importance of each factor which states the value obtained is 0.90 and above. For a whole questionnaire, the CVi (mean of CVR) value of 0.99 shows that validated instrument could be used for further study. All accepted items would be published as a final item in the questionnaire of the Delphi technique round 1, and based on the CVi (mean of CVR) value, the instrument is a content validated questionnaire and could be used in Delphi technique round 1.

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