

Applications of Humanitarian Supply Chain Service Performance (HUMSERVPERF)

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Abstract—Service quality of humanitarian relief organizations has become an interesting issue in recent years. Humanitarian literature has provided an instrument used for assessing the service quality of humanitarian relief organizations, so-called the Humanitarian Supply Chain Service Performance (HUMSERVPERF). However, such instrument requires more tests in different phases of disaster relief. The aim of this study is to show applications of the HUMSERVPERF in the context of preparation and response phase of disaster relief. A project of non-government organization (NGO), which was carried out to offer basic sanitation to limit the spread of COVID-19 among beneficiaries, was used as a case for the preparation phase. A flood relief operation performed by the Department of Disaster Prevention and Mitigation (DDPM) was selected as a case for the response phase. Two pilot surveys were conducted with beneficiaries of both cases by using the adapted HUMSERVPERF which were adapted to fit with the context of each phase of disaster relief. Findings revealed the HUMSERVPERF questionnaire could be used in both phases. Simple mean scores could be calculated and may be used by the organizations to improve their future humanitarian-related activities. Examples of interpretations of the mean scores are provided with suggestions for the NGO and the DDPM to improve their future service quality. The HUMSERVPERF has been provided in the literature as a starting point. This study demonstrated how much HUMSERVPERF need to be modified and expands its applications for use in the context of preparation and response phase of disaster relief.

Keywords—HUMSERVPERF, service quality, humanitarian relief, COVID-19, flood

I. INTRODUCTION

Performance measurement is essential for relief organizations since it shows whether their relief efforts are successful [1]. In relief operations, beneficiaries' evaluation of the service quality of relief organizations has gained attentions in academia and practitioners [2-3]. Beneficiaries' unmet needs can affect the organization's performance, reputation, and possibility for future fundraising [4].

Banomyong and his colleagues have proposed the Humanitarian Supply Chain Service Performance (HUMSERVPERF) framework used for assessing the service quality in the humanitarian context [5]. However, the application of HUMSERVPERF in the article was used to assess only eight beneficiaries' perceptions on the flood relief operations and the researchers also called for applications of HUMSERVPERF in other disaster contexts and phases of disaster relief.

The aim of this study is to provide applications of HUMSERVPERF in the context of preparation and response phase of disaster relief through a project of non-government organization (NGO), operated in preparing communities to prevent the spread of COVID-19, and a flood relief operation performed by the Department of Disaster Prevention and Mitigation (DDPM), a government agency. This study therefore contributes to the humanitarian literature by increasing the context versatility of the HUMSERVPERF. The applications of HUMSERVPERF provided in this study may be used for practitioners involving in the preparation and response phase of disaster relief.

II. LITERATURE REVIEW

The HUMSERVPERF was adapted from SERVQUAL [5], which has been developed by Parasuraman, Berry, and Zeithaml [6]. The HUMSERVPERF consists of two parts: dependent variables and independent variables. The dependent part contains four questions asking overall service quality and satisfaction. The independent part consists of 29 questions used to assess six dimensions of service quality: Tangibility (3), Reliability (5), Responsiveness (4), Assurance (11), Empathy (5), and Supplies Quantity (1). Items are measured using five-point Likert scales anchoring at 1 (lowest) to 5 (highest). An assumption of HUMSERVPERF framework is that the independent variables should have an impact on the dependent part. However, this assumption has not been empirically tested.

An application of HUMSERVPERF questionnaire in [5] was carried out using a case of flood in Mae Sot, a northern province of Thailand. The DDPM at Mae Sot was the main relief actor helping beneficiaries in need. Although, eight beneficiaries were participated in an initial validation of HUMSERVPERF questionnaire, Banomyong and his colleagues have demonstrated that the questionnaire could be used to assess the beneficiaries' perceptions toward the relief service quality performed by the DDPM. In the current study, we will use this questionnaire to assess beneficiaries' perceptions toward the relief service quality performed by the DDPM during another flood event in Mae Sot.

In addition, as this study also aims to measure the service quality performed in the preparation phase of disaster relief, an adaptation of the original HUMSERVPERF questionnaire as shown in [5] is needed. An adapted HUMSERVPERF questionnaire for the preparation phase is explained in the following section and will be used to assess beneficiaries' perceptions toward the relief service quality performed by an NGO operating in preparing communities to prevent the spread of COVID-19.

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III. METHODOLOGY

A. The Case of Flood 2021

Flood occurs almost every year in Mae Sot province. On July 2021, flood occurred in all districts of Mae Sot while there was continuous heavy rainfall during the seven days of flood. In some locations, there had a high flood level of 50 centimeters while some others were more than 1 meter, causing most villagers' homes flooded. Some villagers were trapped inside their homes. The DOPM at Mae Sot province was the main government agency involved in relief efforts and helping beneficiaries.

The original HUMSERVPERF questionnaire was adapted for use in the flood context (Table 1). Seventy beneficiaries affected by the 2021 flood were participated in the survey. They were asked to express their perceptions toward the relief service quality performed by the DOPM during the 2021 flood. A simple mean score for each question was calculated.

B. The Case of COVID-19 Preparation

In 2021, the Shade Tree Foundation (STF) (<https://theshadetreeproject.org/>) launched a project 'Soap N Hope'. Sixteen team members were the main actors traveled throughout the Mae Sot areas distributing soap and providing training on hand washing, basic sanitation, and disease prevention measures to beneficiaries in order to limit the spread of COVID-19. The team members received initial training in disease mitigation and communication procedures and given scripts about hand washing and disease mitigation procedures to follow for community engagements.

The original HUMSERVPERF questionnaire was modified for use in the COVID-19 preparation context (Table 2). The chief and directors of STF helped modified the questionnaire and made it reflect the project's operations. The modified questionnaire was shown and explained to four staff who further approached to 86 beneficiaries to ask them to participate in the survey. They were asked to express their perceptions toward the quality of services performed by the STF. A simple mean score for each question was calculated.

IV. FINDINGS

A. Results from the Flood Relief Case

There were 27 male and 43 female beneficiaries. Their age distributions are as follows: 18-20 (8.6%), 21-40 (25.7%), 41-60 (38.6%), and above 60 (24.3%). A mean score of each question is presented in Table 1. On average, beneficiaries agreed that the DOPM's relief services were good, ranging from 3.46 to 4.20. Similarly, it can be observed from their perceptions toward the overall quality of services (3.97, 3.94) and their satisfactions (4.09, 4.08).

TABLE 1. THE HUMSERVPERF QUESTIONS AND FOR THE FLOOD CASE

Dimension	Question	Mean
Tangibility	The DOPM has up-to-date equipments that are at the ready for use.	3.67
	The DOPM's staff/volunteers dress appropriate to their relief work.	4.01
	The physical facilities and equipments are used correctly according to the DOPM's purpose.	3.87
Reliability	When the DOPM strives to do something by a certain time, it does its utmost to respond and fulfill your needs.	3.80

Dimension	Question	Mean
	When you have problems, the DOPM exhibits appropriate sympathy and listening.	4.00
	The DOPM is dependable.	4.12
	The DOPM provides relief service within an appropriate time frame.	4.16
	The DOPM keeps records on relief service accurately.	3.88
Responsiveness	The DOPM is clear to you exactly when relief services are intended to perform.	3.91
	You receive prompt relief effort from the DOPM's staff/volunteers.	3.97
	The DOPM's staff/volunteers exhibit a willingness to help you.	3.90
	The DOPM's staff/volunteers are available to respond to your requests when on duty.	4.00
Assurance	Staff/volunteers of the DOPM earn your trust.	3.89
	You feel safe in transacting with the DOPM when receiving relief aid.	3.93
	Staff/volunteers of the DOPM are polite, friendly and strive to maintain you dignity.	3.97
	Staff/volunteers get adequate support from the DOPM to do their jobs well.	3.83
	Staff/volunteers of the DOPM have passed the DOPM's training.	3.94
	Staff/volunteers of the DOPM have knowledge and skills related to relief efforts.	4.04
	The DOPM is subject to a good system of accountability.	4.01
	The DOPM maintains a good reputation.	3.91
	The DOPM clearly informs delivery time and locations and emergency meeting points.	3.96
	The DOPM provides up-to-date and accurate information or any useful information appropriate to the disaster situation.	3.80
	You are explained or taught clearly or receive instructions about how to use aid and relief equipments.	3.46
	Empathy	The DOPM gives you personal-consideration.
Staff/volunteers of the DOPM give you personal attention when appropriate.		3.96
Staff/volunteers of the DOPM offer empathic understanding of your needs.		3.87
The DOPM has your highest interests.		3.87
	The DOPM has operating hours that serve you well.	3.96
Supply-Quantity	The DOPM provides relief service that is adequate, appropriate and meets your needs.	4.01
Overall Quality	The quality of DOPM's relief service is...	3.97
	Comparing to my expectation, the quality of DOPM's relief service is...	3.94
Satisfaction	My feelings towards the DOPM's relief service can be described as...	4.09
	My satisfaction towards the DOPM's relief service is...	4.08

B. Results from the COVID-19 Preparation Case

There were 15 male and 71 female beneficiaries. Their age distributions are as follows: 18-20 (4.1%), 21-40 (41.3%), 41-60 (47.4%), and above 60 (7.2%). A mean score of each question is presented in Table 2. On average, beneficiaries agreed that the STF's services were good, ranging from 3.96 to 4.42. Similarly, it can be observed from their perceptions toward the overall quality of services (4.41, 4.29) and their satisfactions (4.28, 4.23).

TABLE II The HUMSERVPERF Questionnaire for the COVID-19 Preparation Case

Dimension	Question	Mean	
Tangibility	The STF has up-to-date equipment that is ready to use.	4.13	
	The STF's volunteers dress appropriately to their work.	4.22	
	The equipment is used correctly according to the STF's purpose.	4.13	
Reliability	The STF does its best to give the services.	4.20	
	When you have problems, the STF exhibits appropriate sympathy and reassuring.	4.21	
	The STF is dependable.	4.17	
	The STF provides service within an appropriate time frame.	4.26	
	The STF keeps records on relief service accurately.	N/A ^a	
Responsiveness	The STF is clear to you exactly when relief services are intended to perform.	N/A ^b	
	You receive prompt effort from the STF's volunteers.	4.13	
	The STF's volunteers exhibit a willingness to help you.	4.28	
Assurance	The STF's volunteers are available to respond to your requests when on duty.	4.13	
	The STF's volunteers earn your trust.	4.21	
	You feel safe in transacting with the STF when receiving aid.	4.21	
	The STF's volunteers are polite, humble and strive to maintain your dignity.	4.31	
	The STF's volunteers get adequate support from the STF to do their jobs well.	4.13	
	The STF's volunteers have passed the STF's training.	4.17	
	The STF's volunteers have knowledge and skills related to efforts.	4.22	
	The STF is subject to a good system of accountability.	4.22	
	The STF maintains a good reputation.	3.99	
	The STF clearly informs delivery time and locations.	N/A ^c	
	The STF provides useful information appropriate to the COVID-19.	4.25	
	You are explained or taught clearly about how to use soap and protect you from COVID-19.	4.42	
	Empathy	The STF gives you personal-centered care.	4.21
		The STF's volunteers give you personal attention when appropriate.	4.10
The STF's volunteers offer meaningful understanding of your needs.		4.12	
The STF has your highest interests.		3.96	
The STF has operating hours that serve you well.		4.33	
Supplier-Quantity	The STF provides service that is adequate, appropriate and meets your needs.	4.24	
Overall Quality	The service quality of the STF is...	4.41	
	Compared to my expectation, the quality of STF's service is...	4.29	
Satisfaction	My feelings towards the STF can be described as...	4.29	
	My satisfaction towards the STF's service is...	4.23	

^a Due to limited team members, the STF could not dedicate staff to do recording tasks.

^b The project was for prevention and the services were delivered on demand.

V. DISCUSSIONS

A. Applications of HUMSERVPERF Questionnaire

This study demonstrated that the HUMSERVPERF questionnaire can be used in both the response and preparation phases. Beneficiaries had a clear understanding of the questionnaires and could respond to most questions. Simple mean scores can be calculated and may be used by

the relief organizations to improve their future humanitarian-related activities.

There was an interesting observation. Not all questions in the original HUMSERVPERF questionnaire could be used by the STF. The STF did not recommend including three questions in the questionnaire: the STF keeps records on relief service accurately; the STF is clear to you exactly when relief services are intended to perform; and the STF clearly informs delivery time and locations and emergency meeting points.

The STF could not keep records on services because it had limit team members and could not dedicate staff to do recording tasks. The chief said that "We like to assign the entire staff to service delivery; however, a debrief was conducted daily to review the staff's performances and get feedback from them." In contrast, the DOPM had a sufficient number of staff and could record their daily works. Actually, recording such daily works is mandatory for all staff, as required by the government.

The STF could not state exactly when the services would be performed and could not inform delivery time and locations to the beneficiaries. This was because the project was initiated for the prevention purpose and the services were delivered on-demand. The STF went down a list of communities and met beneficiaries in person. There were many homes that the STF's staff had visited but did not found any person in the homes. Although the STF did inform the community leaders and the local government about the project, the beneficiaries still did not know when and where the services would be performed. This might be because the project was intended to conduct informally and the government and community leaders did not think it was significant, said by the STF director. Compare with the DOPM, these two questions showed no issue. This was because the DOPM is a government agency and has been regulated to formally declare and inform beneficiaries everything it does.

B. Interpretations of the Results

The applications of the HUMSERVPERF questionnaire provided in this study may be used as a guideline for the organizations to understand the beneficiaries' perceptions on the services provided. Implications of the results of both versions could be made as follows.

In the case of flood relief, although most questions received good scores, the DOPM may consider improve the two lowest scores: beneficiaries were explained or taught clearly or receive instructions about how to use aid and relief equipments (3.46) and the DOPM was clear to beneficiaries exactly when relief services are intended to perform (3.51). Improving the former score may be carried out straight forward by attaching instructions in all aid delivered. However, it was more challenging for some beneficiaries who could not read English language on some relief materials, highlighted by a beneficiary. Emphasizing the DOPM staff to explain and teach beneficiaries about how to use relief aid should be a better solution.

In the case of COVID-19 prevention, there were two questions received the lowest scores: the STF maintained a good reputation (3.99) and the STF had your highest interests (3.96). The former suggests that the STF may need to increase the beneficiary's awareness of its organization. This

may be done by actively approaching to beneficiaries and initiating more activities with them. The latter indicates that the STF may need to emphasize its staff about the service mind when training or briefing volunteers and staff.

VI. CONCLUSION

This study provides applications of the HUMSERVPERF questionnaire in the context of context of the preparation (i.e., COVID-19 preparation) and the response (i.e., flood) phase of disaster relief. To the humanitarian literature, this study contributes by increasing the context versatility of the HUMSERVPERF. The applications of HUMSERVPERF provided in this study may be used for practitioners involving in the preparation and response phase of disaster relief.

There was a limitation for the case of preparation phase: not all questions in the study could be used with the illustrating case. The illustrative cases in this study showed that the HUMSERVPERF questionnaire need to be modified according to the type of organizations, i.e., whether it is an NGO or a government agency. Future research should explore more cases for this phase. It is expected that the questionnaire need to be modified every time when adapting with a new case and this is a challenge if we want to settle the questionnaire or make it generalizable. A question is that how many cases we do need to identify a set of common questions that can be used with most cases. A large relief organization that performs relief activities formally and has sufficient staff is needed. Last but not least, the literature still does not have a case of relief organization operating in the recovery phase.

The HUMSERVPERF questionnaire was proposed as a starting point in the previous study. This study only provided more applications of the questionnaire. Further development of the HUMSERVPERF is needed, for examples, purifying the questions, validating the scales, and testing the HUMSERVPERF assumption.

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