Improved Lead Time Efficiency and Cost Efficiency in the Humanitarian Relief Aid in Disaster Supply Chain in Malaysia

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This thesis is submitted in partial fulfilment of the requirements for the award of Bachelor of Technology Management (Supply Chain Management and Logistics) with Honors

Faculty of Technology Management and Technopreneurship
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January 2023

DECLARATION OF ORIGINAL WORK

I hereby declare that all the work of this thesis entitled “Improved Lead Time Efficiency and Cost Efficiency in the Humanitarian Relief Aid in Disaster Supply Chain in Malaysia” is original done by myself and no portion of the work encompassed in this research project proposal has been submitted in support of any application for any other degree or qualification of this or any other institute or university of learning.

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DEDICATION

I would like to appreciate the dedication of my beloved family members who educated me and motive me to learn until degree level. And also, I express a deep sense of gratitude to my lecturer whom also my supervisor for my final year project, Miss Atikah Saadah Binti Selamat and my fellow friends which is Benronica Janam Anak Bennet Baja, Nur Anissa Farzana Binti Azman and Izyan Khalisa Binti Haron. They have provided me fully support and advice throughout this research. Without their blessing and encouragement, this research is impossible to complete within short period of time

ACKNOWLEDGEMENT

First and foremost, I would like to express my gratitude to God for giving me good health, strength, and the opportunity to gain my knowledge successfully to complete this Final Year Project (FYP) within a given time. I would like to thanks my parents for their support and patient in waiting for me to finish my degree. I also express my sincere thanks to my friends for giving timely pieces of advice to this research project. They are sharing a lot of knowledge related to proceed this research project. It helps me to complete this research project more efficiently.

Lastly, I am expressing my sincere appreciation and thanks to my beloved supervisor Miss Atikah Saadah Binti Selamat for her helping, teaching, monitoring, support, and contribution. She has guided and assisted me patiently during two semesters in session 2022/2023. Also, I sincerely appreciate and thank Dr Atirah Binti Sufian as my panel research for sharing his knowledge and experience in Research Methodology. Her suggestions have been useful for me to proceed well this research project.

ABSTRACT

This finding highlights the significance of humanitarian organisations' (HOs) efforts to lessen suffering and enhance peoples' quality of life. HOs are forced to pursue more accountability by increasing their efficiency in terms of time and cost in activities, especially in preparedness activities, because the increased donations and assistance to HOs still do not completely resolve this major problem. HOs require partners to collaborate with in order to alleviate suffering because they lack the resources necessary to handle the disaster problem on their own. The performance management method, which measures performance through integration, is the key to helping HOs and their partners achieve cost- and lead-time effectiveness.

Keyword: HOs, cost, lead-time, effectiveness

ABSTRAK

Penemuan ini menyerlahkan kepentingan usaha organisasi kemanusiaan (HO) untuk mengurangkan penderitaan dan meningkatkan kualiti hidup orang ramai. HOs dipaksa untuk meneruskan lebih akauntabiliti dengan meningkatkan keberkesanan dan kecekapan mereka dari segi masa dan kos dalam aktiviti, terutamanya dalam aktiviti kesediaan, kerana peningkatan derma dan bantuan kepada HOs masih tidak menyelesaikan sepenuhnya masalah utama ini. HOs memerlukan rakan kongsi untuk bekerjasama untuk mengurangkan penderitaan kerana mereka kekurangan sumber yang diperlukan untuk menangani masalah bencana itu sendiri. Kaedah pengurusan prestasi, yang mengukur prestasi melalui penyepaduan, adalah kunci untuk membantu HO dan rakan kongsi mereka mencapai keberkesanan kos dan masa utama.

Kata kunci: HOs, kos, masa utama, keberkesanan

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LIST OF ABBREVIATIONS

ABBREVIATION	MEANING
BSc	Balanced Scorecard
CE	Cost Efficiency
EDI	Electronic Data Interchange
ERP	Enterprise Resource Planning
HL	Humanitarian Logistic
HO	Humanitarian Organization
HSC	Humanitarian Supply Chain
HSCM	Humanitarian Supply Chain Management
KPI	Key Performance Indicator
LTE	Lead Time Effectiveness
MEAL	Monitoring, Evaluation, Accountability, and Learning
NGO	Non-Governmental Organization
PEAR	Preparedness to Emergency Action Response
SC	Supply Chain
SCOR	Supply Chain Operations Reference
SCM	Supply Chain Management
SCPI	Supply Chain Process Integration
SOP	Standard Operating Procedures
UN	United Nations

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CHAPTER 1

INTRODUCTION

1.1 INTRODUCTION

The relief chain's goal is to deliver humanitarian aid in the form of food, water, medication, accommodation, and supplies to places hit by large-scale disasters. Relief organizations fall into three categories: UN-affiliated organizations (such as the World Food Programme), international organizations (such as the International Federation of Red Cross and Red Crescent Societies, which operates as a union with country offices that are auxiliary to country governments), and non-governmental organizations (such as the International Federation of Red Cross and Red Crescent Societies, which operates as a federation with country offices that are auxiliary to country governments) (NGOs). NGOs also have country offices, although not associated with the countries' governments (Thomas and Kopczak, 2005). Each form of organization has its own set of regulations. Regarding legislation, the United Nations and non-governmental organizations (NGOs) are two separate bodies (Seaman, 1999). In contrast, there may be similarities among NGOs and other relief groups regarding relief chain structures, processes, and operations.

1.2 BACKGROUND OF STUDY

Non-profit relief groups differ from for-profit commercial (private) organizations because they are not for profit. Characterizing the supply networks of charity and for-profit enterprises requires understanding their general characteristics. Firstly, by describing the differences between non-profit and for-profit organizations in this section. Next, look at relief NGOs and for-profit supply chains, describing the distinct characteristics and identifying the fundamental contrasts that affect the establishment of a relief chain performance measurement framework.

Organizations That Are For Profit Versus Those That Are Not.

There is a large body of research that compares non-profit and for-profit organisations from many angles (e.g., O'Neill and Young, 1988; Vladeck, 1988; Moore, 2000). In terms of funding sources, goals, stakeholders, and performance evaluation.

1) *Revenue Source*

One of the key differences among non-profit and for-profit organisations, according to Moore (2000), is the source of revenue: Government money, charitable donations from people and enterprises, and in-kind campaign contributions (non-monetary charitable donations such as commodities) are the defining sources of revenue for non-profit organisations, whereas revenues earned from the distribution of goods and services to customers are the defining source of revenue for for-profit organisations. In other words, for-profit corporations get their money from customers who buy goods and services for their personal advantage; non-profit organisations get their money from people and organisations who don't expect anything in return (Moore, 2000; Henderson et al., 2002; Oster et al., 2004, p. 278). Raising funds and the selling of products and services are other ways for non-profits to generate cash (Oster, 1995, p. 14). Non-profits, on the other hand, are subject to regulatory restrictions on how they can utilise their earned earnings (due in part to the tax relief offered to these organisations); any financial surplus generated by operations cannot be handed to individuals in charge, personnel, or membership (Oster, 1995, p. 4).

2) *Goals*

The primary purpose of private-sector businesses is to make money and give enough financial returns to shareholders (Boland and Fowler, 2000). Non-profit organisations, on the other hand, do not seek to make a profit; rather, they aim to fulfil their social purpose (Moore, 2000; Baruch and Ramalho, 2006). "Money is the means to a desired social objective in public sector firms," writes Moore (2000). The products and services provided in the private sector are "means to an end of producing money." Non-profit organisations must also be concerned about their financial well-being, as it is critical to their aims and existence. Finances, on the other hand, are restrictions for non-profits rather than objectives; that is, while these organisations must manage their spending and adhere to annual financial, their effectiveness cannot be assessed by how closely their expenditure matches the amounts allocated (Kaplan, 2001). Setting the objective of a for-profit corporation based on shareholder wealth does not imply that all other stakeholders' interests must be compromised for the benefit of shareholders (Moore, 2000).

3) *Stakeholders*

Stakeholders are described as "any person or group who can influence or is influenced by an organization's achievement of its objectives" (Freeman, 1984, p. 46). In terms of stakeholder characteristics, for-profit and non-profit organisations can be distinguished. As per Speckbacher (2003), all business enterprises have one favoured interest group that is clearly defined and homogeneous in terms of interests; in other words, the interests of a firm's owners dictate the firm's policy. Non-profits, on the other hand, serve a diverse range of stakeholders with varying goals and needs (Speckbacher, 2003). As a result, a non-profit organization's stakeholders include financial donors, service beneficiaries, staff, and volunteers.

For-profit companies have various stakeholders, including consumers, employees, merchants, and suppliers, all of whom have expectations and needs that must be considered. Multiple stakeholders may necessitate sacrifices but, in for-profit firms, fulfilling the requirements of several stakeholders does not usually conflict with the company's long-term aims. After all, establishing customer loyalty and involving providers and employees in the firm's work maximises shareholder wealth over time (Moore, 2000). Because of the competing interests of sources of revenue (funders), benefit providers, and recipients, managing trade-offs in non-profit organisations may be more difficult.

4) *Performance Measurement*

Because for-profit and non-profit organisations have different characteristics, their performance metrics and assessment systems are also different. Although measuring the performance of any organisation can be difficult, there are additional challenges that have been addressed in the literature (Kanter and Summers, 1987; O'Neill and Young, 1988; Letts et al., 1999, pp. 133-136; Sawhill and Williamson, 2001; Brooks, 2002; Poister, 2003, pp. 8-9, 17-21; Speckbacher, 2003; Parhizgari and Gilbert, 2004; Micheli and Kennerly, 2005).

1.3 PROBLEM STATEMENT

Humanitarian logistics refers to the process of engaging people, assets, abilities, and knowledge to assist victims of disasters. Logistics is at the heart of all mobilisation activity in the humanitarian process, serving as the link between disaster response, warehousing and distribution, and hub and the field. Furthermore, it could be one of the greatest complex pieces of the relief effort. The operation's effectiveness is constantly monitored in order to minimise operating costs while achieving the best possible results. As a result, disaster management is a critical key to the successful implementation of humanitarian efforts (Tomasini & Van Wassenhove, 2009).

Natural disasters seem to strike all corners of the world in today's environment due to climate change, so the significance of humanitarian logistics is undisputable. Human failure and infrastructure destruction could be managed and avoid if proper planning and execution were carried out. The disaster's negative impact can be severe at times. The magnitude of the disaster may overwhelm authorities and all other interested parties. As a result, relief aid and reaction operations may be inadequate and ineffective. As a result, various stakeholders must know their roles in international aid and disaster relief and take proactive measures to respond effectively in order to reduce the disaster's negative impact on the emergency community (Sahay et al., 2015).

1.3.1 The Stage of Preparedness

The ability of the HOs to maintain the movement of supplies, data, financial services, people, and understanding during the preparedness stage is critical to the success of the response stage in addressing urgent problems during and after disasters (Tomasini & Van Wassenhove, 2009a). Jahre and Heigh (2008) contend not only that the HSC performance of the instant disaster response but also the subsequent reconstruction is inextricably linked with the preparedness stage and advocate for better preparation in a position to react and reconstruct better. According to Thomas and Mizushima (2005), logistics serves as the link that connects preparedness and response, procurement and distribution, and headquarters and local units.

The logistics expenses during the preparedness stage can make up a significant portion to 80% of the actual expenses (Van Wassenhove, 2006). Furthermore, the increased number of

disasters results in complex disaster relief operations regarding information availability, duplication of efforts, transparency, resource and financing accessibility, and planning and scheduling (Jahre et al., 2016). These challenges necessitate an evaluation of relief operations to improve operating effectiveness, reduce redundant work, and maintain resources more effectively (Ibid).

However, the actual definition of preparedness remains puzzling regarding how logistics aid the preparedness operation (Jahre et al., 2016). Nonetheless, Tomasini and Van Wassenhove (2009a) attempted to define preparedness as a phase in which all actors collaborate to minimize harmful repercussions before a disaster occurs. Personnel training, institution establishment, financial resource indicators, preparation of logistic support shelter, prepositioning goods, household preparedness, first aid, and coordination can all be components of the preparedness phase (Jahre et al., 2016). Van Wassenhove (2006) further subdivided the readiness stage into five activities: inventory (prepositioning goods), infrastructure (establishing a distributed system and information exchange), human resources (skills and training), operational processes and service management (framework arrangements), financial resources (funding), and community.

A humanitarian organization (HO) works to prevent or mitigate the effects of natural disasters. Donors, suppliers, and logistic service providers are examples of partners. They work directly with HOs and are responsible for delivering physical products such as aid to affected areas and non-physical products such as transportation and warehousing. According to the Business Dictionary (2020), a natural disaster is a sudden thing in nature, such as earthquakes, storms, and floods, that injures or kills people and causes damage.

1.4 RESEARCH QUESTIONS

The researcher determined three research questions in this study:

i. What are HSC performance measurements required during the HSC preparation process to achieve lead time effectiveness and cost efficiency?
ii. How can the HSC performance management process be integrated into the HSC readiness stage to improve lead time effectiveness and cost efficiency?

1.5 RESEARCH OBJECTIVES

In this research, there are three research objectives to be figured out:

i. To determine performance measurements required in the HSC's mobility stage to reach lead time effectiveness and cost-efficiency.
ii. Trying to implement a recommended continuous improvement process by utilizing IT technologies, improving language, and implementing standardization in HSC.

1.6 SCOPE AND LIMITATION OF STUDY

This research paper is focusing on the is concerned about the improvement lead time efficiency and cost efficiency in humanitarian relief aid in Malaysia.This study will be conducted among 100 respondents from NGOs near Melaka. The selected respondents will be chosen randomly. The researcher will be carried out by distributing questionnaires to the respondents.

The limitation of the study is the inaccurate data from respondents due to them was chosen randomly by the researcher. The researcher may not focus on every single company. Besides, the researcher experienced the time limitation in conducting the study. The research faced time constraints since the study needed to be completed in a short period of time which is 10 months.

1.7 FRAMEWORK

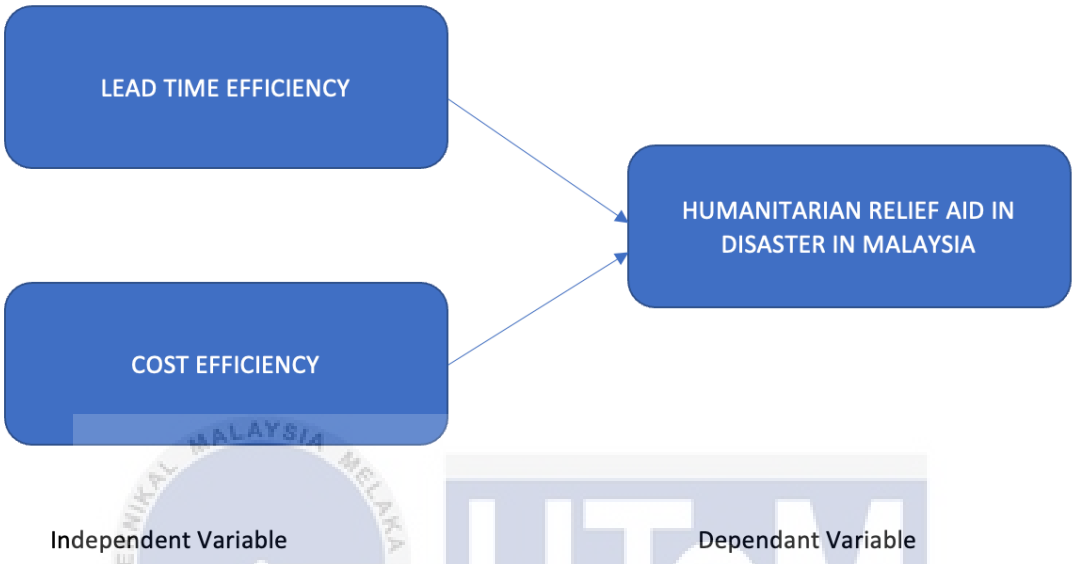

Figure 1: Framework (*Own Illustration*)

1.8 SUMMARY

In conclusion, this chapter is discussed about the overview of the study. It discussed the background of the study, problem statement, research questions, research objectives, scope of the study, framework and summary. In the coming chapter, the researcher will carry out the literature review of the study. The information will be broader and more understandable by audience.

CHAPTER 2

LITERATURE REVIEW

2.1 INTRODUCTION

This chapter presents the overall theory for the research. The goal is to provide sufficient details on the humanitarian supply chain, disaster management, and preparedness phase to the viewers so that they can understand the issues described in the current chapters and assist the researchers in building the foundation of the analysis. The distinction between humanitarian logistics and humanitarian supply chain will be discussed first. The disaster management cycle and disaster management will then be introduced to as the main goals and problems of disaster risk management. Finally, the stage of preparation will be discussed in greater depth. The literature review is required to develop a suitable research methodology method such as quantitative research.

2.2 CONCEPT

The HSC's primary goal is to provide help to everyone affected by the crisis or pandemic. Its goal is to get the appropriate supplies to the right people at the right time and in the right place (Banomyong et al., 2019). It's vital to remember that not all crises or tragedies have the same qualities or consequences. The HSC is complicated, and it necessitates the participation, activity, and intervention of a variety of stakeholders. There are four types of disasters, according to Van Wassenhove (2006) which is abrupt onset, slow onset, natural causes, and anthropogenic causes. As a result, three fundamental issues during a disaster crisis or pandemic are proposed by Kovac and Spens (2009) which is disaster types, disaster relief, and pandemic relief.

2.3 HUMANITARIAN SUPPLY CHAIN VS. HUMANITARIAN LOGISTICS

Humanitarian operations aim to provide aid, relief, and assistance in the aftermath of disasters (Howden, 2009). In 2009, the International Federation of Red Cross and Red Crescent Societies proposed defining humanitarian operations as *"a sudden, calamitous event that seriously disrupts the functioning of a community or society and causes human, material, economic, or environmental losses that exceed the community's or society's ability to cope using its resources." Disasters, although often derived from natural, can also have human causes." Overstreet et al. (2011), p.115*

Humanitarian procedures participate in various operations, such as providing assistance and relief through a temporary shelter or access to medical care, which are at the heart of HL (humanitarian logistics) and HSC. Both terms are most likely associated with HOs (Howden, 2009). HOs can be government agencies, multilateral or non-governmental organizations. Depending on size, objective, and specialization, these organizations may or may not have a logistics or supply chain department.

HL units typically performed sourcing, warehousing, fleet management, supply transportation, people transportation, financial services, management company, safety, information systems, and communication systems . HSC is defined by Mentzer et al. (2001) as the network formed by various streams (supplies, facilities, details, and funds) between donors, suppliers, beneficiaries, and other units of humanitarian organizations to provide tangible relief to disaster victims.

Figure 2 helps the reader distinguish between the two terms in terms of understanding the scope of this study.

HUMANITARIAN SUPPLY CHAIN

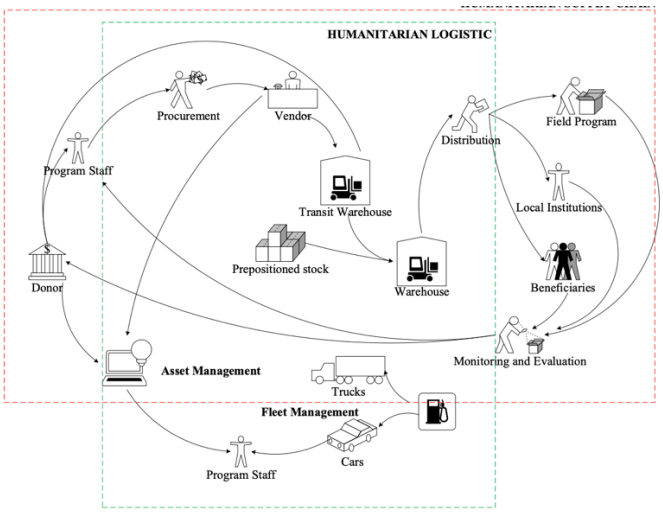

Figure 2 shows the flow of HL versus HSC. Howden's original (2009, pp. 3).

As illustrated in Figure 3, an HSC would include more performers such as donations, recipients, LSPs, and providers, whereas an HL includes logistics-related activities and partner organizations. HSC is more accurately used in this research to illustrate the context of the research, which includes donations, LSPs, and suppliers. The research questions are focused on improving performance in terms of performance (lead time) and efficiency (costs), so the definition is more cantered on HSC (monitoring and analysing), both in terms of measurement and integration. However, HL is still mentioned for discussion purposes in some cases in this thesis because 60 to 80 percent of HO funds during a disaster response would go to HL activities (Lamenza et al., 2019; Van Wassenhove, 2006; Trunick, 2005) and it consumes a more significant portion of humanitarian operations in terms of volume of activities, flows, and parties involved (Howden, 2009).

2.4 CYCLE OF DISASTER MANAGEMENT

HO supply chain or logistics management staff frequently face issues and constraints that their revenue counterparts do not. Overall, an HSC faces numerous challenges, including efficient or effective resource mobilization (Ahmed et al., 2019), a lack of economic resources (Ahmed et al., 2019), inadequate logistics infrastructure (Liu et al., 2010), slow coordination and reaction (Chandes & Paché, 2010), and disorganized technology and IT integration (Tatham & Spens, 2011).

Disaster management encompasses all activities, programs, and creation and modification before, during, and after disasters to reduce the impact of disasters and recover quickly from the damages caused by natural disasters (Khan et al., 2008). Disaster management is performed as follows previously, throughout, and after a massive failure.

1. *Before disaster (pre-disaster):* This activity aims to minimize total and property damages suffered by a possible threat. HOs, for example, conduct awareness campaigns and develop emergency preparedness at the international and domestic levels.
2. *During disaster (disaster occurrence):* This process entails initiatives to assist victims, fulfil their needs, and alleviate their hardship. All actions performed during this phase are emergency and response activities.
3. *After a disaster (post-disaster):* This action intends to reach full recovery or restoration of disaster-affected areas.

The disaster management cycle is normally divided into four phases: mitigation, preparedness, responses, and rehabilitation.

1. *Mitigation* is when disasters are minimized and proactive social emergencies are addressed, such as regulations and processes to reduce population vulnerability and increase resilience. Building codes of conduct, vulnerability analysis, and public education are a few examples (Tomasini & Van Wassenhove, 2009a; Khan et al., 2008; Warfield, 2008).
2. *Preparedness* is the stage in which plans are made to respond to the tragedy in the future. For example, preparedness intends urgent training and warning systems.
3. *Response* is the phase that reduces disaster risks and involves highly complicated logistics. Relief and rescue processes, for example
4. *Rehabilitation* is the process in which the affected area is returned to normal and assessments, and advancements are developed, after which the information is transferred to the mitigation phase. Building recent migrants, for example, and medical treatment.

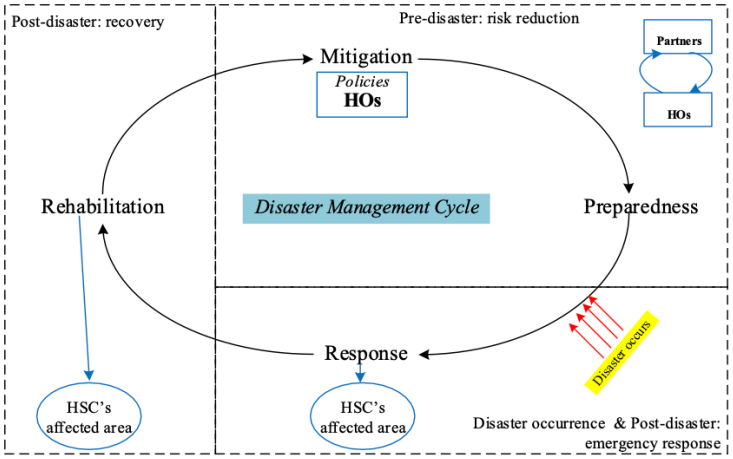

Figure 3: Disaster Management Cycle. Khan et al. (2008, pp. 47).

The emergency management cycle assists all actors, including HOs, in indicating the ongoing process of reducing disaster impact, responding during the tragedy, and taking initial steps to retrieve the damaged parts (Warfield, 2008). Proper action at all stages, including developing policies, revising plans, and mitigating the effects on people, assets, and infrastructure, will result in increased readiness, better warnings, and reduced vulnerability. However, the cycle stages may overlap at times, and the time intervals between each phase are determined by the intensity of the emergency.

2.5 DISASTER PREPAREDNESS STAGE

Preparedness intersects with both pre-disaster and post-disaster occurrences, acting as a temporal connector between the two, and is widely understood as an indicator to react quickly and recover quickly once a disaster occurs, ensuring essential skills and resources are easily accessible to deploy (Sutton & Tierney, 2006). Although this effort compiles and summarises findings from disaster preparedness research works and guidance documents to identify activities, it fails to devise how the actions could be implemented in the field.

On another level, elik et al. (2012) state that disaster preparedness includes facility location selection, asset prepositioning, allocation of resources, transportation planning, and the development of collaborations and agreements for a disaster that occurs.

Materials flow is concerned with finding the proper good and services to the correct location at the right time to the right people. It represents a high level of uncertainty in assessments and the necessary quantity and quality. Water, medical, water treatment tablets, tents, blankets, and

nutrient biscuits for malnourished children are the most commonly required items in disaster relief.

In the preparedness stage, information is crucial in designing a supply chain to resolve the needs of its target beneficiaries, defining and trying to decide on the way to meet needs, guaranteeing coordination and avoiding duplication of the rescue operation, and knowing who will be participated in the disaster response and in what quantities such as lead agency, implementing partner, inter-agency coordinator and other (Tomasini and Van Wassenhove, 2009a).

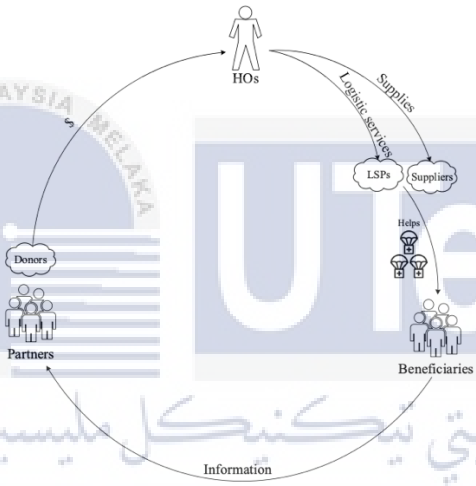

Figure 4: Depicts the flow of funds, information, and supplies in the HSC. Howden's original (2009, pp.4).

As illustrated in Figure 5, funds flow from donors to HOs, which is why many HOs regard donors as customers in the HSC (Beamon & Balcik, 2008). Other partners' flows involve substance, data, people, and knowledge to HOs, such as logistics activities such as warehouse operations (Tomasini & Van Wassenhove, 2009a). Furthermore, Tomasini and Van Wassenhove (2009a) observe that finding revenue to fund disaster preparedness is challenging since funders are much more engaged in fundraising for specific relief during the response stage than in investing in disaster preparedness activities in-between disasters. Jahre and Heigh (2008) add that despite bearing the lion's share of the total relief cost, donors are often unwilling to invest in humanitarian aid supply chains.

The primary yet challenging task for the preparedness stage is to select and train people capable of making plans, organizing, responding, and getting involved when and where essential at the community scale, thus upgrading local skills (Van Wassenhove, 2006). However, establishing and upgrading the local skill bank is hampered by a limited pool of trained staff or specialists with high turnover. Obtaining, clarifying, and knowledge transfer learned from past disasters, referred to as knowledge management, is, on the other hand, a key aspect for most HOs due to the exact facts of high staff turnover and a lack of experts.

2.6 HYPOTHESES

The following are the hypotheses in this study:

i	Improved Lead time Efficiency
H0:	There is no significant relationship between lead time efficiency and humanitarian relief aid in disaster.
H1:	There is a significant relationship between lead time efficiency and humanitarian relief aid in disaster supply chain in Malaysia.
ii.	Cost Efficiency
H0:	There is no significant relationship between cost efficiency and humanitarian in disaster supply chain in Malaysia
H1:	There is a significant relationship between cost efficiency and humanitarian relief aid in disaster supply chain in Malaysia.

Table 1: Hypotheses *(Own Illustration)*

2.7 SUMMARY

In this chapter, the researcher have discussed on humanitarian supply chain vs humanitarian in logistics. It also consist of cycle of disaster management and also disaster preparedness stage. Last but not least, the following chapter will be discussed about the research methodology.

CHAPTER 3

RESEARCH METHODOLOGY

3.1 INTRODUCTION

This chapter will discusses the methodologies used to collect the data and information for this research. The section of this chapter will begin with explanatory research design to explain and describe the relation between the variables. Quantitative method is utilizes in methodological choice. The type of data acquired for this study is primary and secondary data. The following sections in this chapter will discusses further on the research location, research strategy, time horizon, reliability and validity of the data analysis method. The research will be carried out according to these research methodology procedure to ensure it can be better understood and evaluated.

3.2 RESEARCH DESIGN

The nature of this research is explanatory in which it is a research method that explores the reason on why something occurs when limited information is available. The subject of lead time efficiency and cost efficiency has been studied but there is small number of researchers that discusses the topic indirectly. This method could easily increase the researcher understanding on the topic.

3.3 METHODOLOGICAL CHOICES

This research will be done using the quantitative study in order to examine the relationship between variables stated in the research. The study will be conducted quantitatively as the methods are highlighting objective measurements and the statistical, mathematical or numerical analysis of data collected through questionnaire, surveys and polls as well as by utilizing the pre-existing statistical data using computational techniques. It is common that quantitative research associated with deductive approach, in which it focuses on utilizing data to test the theory. This method speculates theory that is properly formed by relating them back to general principles and definitions through sets of observable data (Huygens, 1629). Then, the researcher will reconfirm the radical relationship exists or not as

the relationship has been established. This research will be conducted quantitatively as the research want to determine the relationship between the independent variable (lead time efficiency and cost efficiency) and the dependent variable (humanitarian relief aid in disaster).

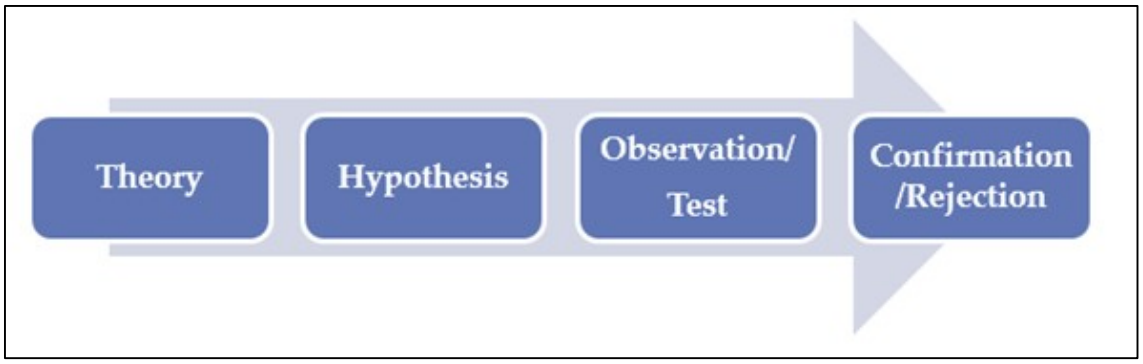

Figure 5: Deductive Approach by Huygens in 1629

3.4 PRIMARY AND SECONDARY DATA

The primary and secondary data will be acquired and to be applied in this research in order to further carry out this research. For primary data, it will be collected by the researcher through surveys, questionnaire and interviews for the research problem that is being studied in this case.

As for secondary data, the data that have been obtained by market research agencies and other organization and individuals which is available to the public, will be utilized in the research. This is due to using secondary data can save time and effort as for the process to collect. Secondary data is much easier than primary data. Secondary data are to be gathered from website and library database by selecting suitable articles, journals, reports, as the data sources to be utilized as references for this research.

3.5 RESEARCH LOCATION

This study will be conducted at selected organizations located at Melaka. This is because the selected organizations are organizations that organized relief aid in Melaka. The target respondent are the employees of the organizations. The age of the respondents are between 18 years old and above whom are appropriate to work in a HO company that utilize relief aids and have been educated about what is humanitarian in supply chain.

3.6 RESEARCH STRATEGY

Research strategy for this study is to conduct survey through questionnaire towards selected organization. The survey strategy is selected in this research as it was easier to perform data comparison from a sizeable population using questionnaire in survey strategy. In addition, researcher also will select archival or documentary research strategy since these sources are able to be sourced online.

3.6.1 Questionnaire Design

For this research, researcher will conduct the questionnaire through internet (online Google Form) where the respondents able to use web or smartphone to gain access to the questionnaire to answer the question. The questionnaire contains three part. The first part is the demographics of the respondent which includes age, gender, educational level, occupation and on how familiar they are on what is relief aid in supply chain activities. The second part will be focusing on the independent variables: Lead time efficiency and cost efficiency. The last part of the questionnaire will be questioning about the dependent variable which is the humanitarian relief aid in disaster in Malaysia.

Likert scale will be apply in the questionnaire to measure the responses by the respondents. According to Dr. Saul McLeod, “Likert scale is a five (or seven) point scale which is used to allow the individual to express how much they agree or disagree with a particular statement”. Likert scale are to be utilized in this research as it assumes the strength or intensity of an attitude is linear on a continuum from strongly agree to strongly disagree and makes the assumption that attitudes can be measured. Likert scale is applied in second part and third part of the questionnaire and are based on five points rating scale in which 1 represented “strongly

disagree", 2 represented "disagree", 3 represented "neutral", 4 represented "agree" and 5 represent "strongly agree".

Strongly disagree	Disagree	Neutral	Agree	Strongly Agree
1	2	3	4	5

Table 2: Five points rating scale by Rensis Likert in 1932

3.6.2 Sampling Design

In this research, convenience sampling will be used. The convenience sampling is a method adopted by researchers that enable researchers to gather their data from conveniently available pool of respondents (Convenience Sampling: Definition, Advantages and Examples, 2022). It is one of the most common sampling technique used as is an expensive methodology, much easier to conduct research and, and able to collect data quickly (Convenience Sampling: Definition, Advantages and Examples, 2022).

Since the population of the organizations has 110 of employees. Both the information on employee amount is from the LinkedIn website of the organizations, which stated range of amount of employees that the organization currently has. Also, the amount of population are further strengthen from websites that list down the population of employees within the company. Thus accumulated sample amount for respondents in this research is about 80 respondents. The determined total was based on Krejcie and Morgan (1970) that develop the sample size based on the population size of the company.

Population Size (N)	Sample Size (S)
100	80
200	132
300	169
400	196
500	217
600	234
700	248
800	260
900	269
1000	278
2000	322
3000	341
4000	351
5000	357
6000	361
7000	364
8000	367
9000	368
10 000	370
15 000	375
20 000	377
30 000	379
40 000	380
50 000	381
75 000	382
1 000 000	384

Table 3: Determining sample size of a known population

Source: Krejcie and Morgan (1970)

3.6.3 Pilot Test

Pilot test will be conducted for this research on members of target population to evaluate the reliability prior to their final distribution. According to Matt Wright & Nick So, it is a rehearsal for my research study that in which it allow researchers to test their research approach with a small number of test participant before the main study is launched. It is important that the research are critiqued, test, and iteratively improve the research design before the execution phase (So, 2022).

3.7 TIME HORIZONS

This study is categorized as cross-sectional studies as the data that are gathered for this research are only once which take about 3 to 4 weeks to conduct. The cross-sectional studies are chosen due to limited amount of time to complete this research. The research are done in a total of ten months which includes the development of Chapter 1 to Chapter 5 within ten months. There is only one month of time period to conduct the data collection and analysis.

3.8 RELIABILITY AND VALIDITY

Reliability and validity of this research will be measure using Cronbach's Alpha to measure the reliability of the variables. The range in alpha coefficient is between 0 and 1. According to Cronbach's Alpha, when the values shows more than 0.7 is considered acceptance, more than 0.9 is considered good, and equal or more than 0.9 result is considered good, and equal or more than 0.9 is considered excellent. Meanwhile, if the value of Cronbach's Alpha displayed less than 0.6, it is considered poor which indicate not-reliable. Value 0.5 and below is considered unacceptable that shows inaccurateness on the data when the value result in a negative number.

Cronbach's Alpha Coefficient Range	Strength of Association
$\alpha \geq 0.9$	Excellent
$0.9 > \alpha \geq 0.8$	Good
$0.8 > \alpha \geq 0.7$	Acceptable
$0.7 > \alpha \geq 0.6$	Questionable
$0.6 > \alpha \geq 0.5$	Poor
$0.5 > \alpha$	Unacceptable

Table 4: Cronbach's Alpha Coefficient Range and Strength of Association

Sources: Saunders et al., (2016)

3.9 DATA ANALYSIS METHOD

Once the data are obtained from the questionnaires, Statistical Package of Social Sciences (SPSS) will be utilized to analyse the data collected from the respondents. For this part of the research, descriptive analysis, Pearson's correlation analysis and multiple regression analysis will be used to analyse data used in this research.

3.9.1 Descriptive Analysis

Descriptive analysis refers to the use of numerical description and comparison of variables that target on the central tendency and dispersion (Saunders, 2016). The general method to measure descriptive static are to measure the means, medians, modes and standard deviation. For this research paper, descriptive analysis will be utilize to analyse the gender, age, occupation and educational level among the respondents. Then, once the raw data are done analysed and turned into information in order to ensure better understanding of the data.

3.9.2 Pearson's Correlation Analysis

In order to compute linear relations intensity between the dependent variable (organizations' supply chain performance) and independent variables (lead time efficiency and cost efficiency), Pearson's Correlation analysis will be used. Pearson's correlation coefficient is between -1 to +1 represent perfect negative and perfect positive correlations. Thus, the value of 0 will indicate no association correlation.

Correlation Coefficient Value (*r*)	Direction and Strength of Correlation
-1	Perfectly negative
-0.8	Strongly negative
-0.5	Moderately negative
-0.2	Weakly negative
0	No association
0.2	Weakly positive
0.5	Moderately positive
0.8	Strongly positive
1	Perfectly positive

Figure 6: Value of correlation coefficient

Sources: (Saunders, 2016)

3.9.3 Multiple Regression Analysis (MRA)

The MRA also will be used in this study as the research objective is to determine whether the relationship between two variables (lead time efficiency and cost efficiency) depends on the value of third variable (organization's supply chain performance). Multiple regression analysis is a statistical tool that enable the researcher to assess the strength of the cause and effect relationship between two independent variables and one dependent variable (Saunders, 2016). In this research, the researcher will need to understand the relationship between the independent variable (lead time and cost efficiency) toward the dependent variable (humanitarian relief aid in Malaysia). The multiple regression analysis will be able to assist the researcher to determine the independent variable that has the greatest impact on the dependent variable. The following is the equation of multiple regression analysis:

Equation of MRA: $Y = a + bX1 + cX2$

Where:

Y = Dependent Variable (Consumer Behaviour)

a = Constant value or Intercept b = Influence of

X1 (IMC tools) c = Influence of X2 (types of

media)

X1, X2 = Independent variables

3.10 SUMMARY

Conclusively, this explanatory research is require the researcher to conduct survey questionnaire to a total of 103 respondent from organizations in Melaka. The respondents are required to answer the questionnaire through Google Form. This research is using cross-sectional time studies, in which the data are collected only once. Before the survey questionnaire is launched, pilot test will be conducted to test and improve the research. Besides, secondary data are referred for this study, in which it includes online journal, articles, reports and books. In order to measure the reliability of the variables, Cronbach's Alpha is utilized. Once the data are obtained, the data will be analysed using descriptive analysis, SPSS (Statistical Package of Social Sciences) Pearson's correlation analysis, and multiple regression analysis. The data that has been analysed and discussed will be discussed in Chapter 4.

CHAPTER 4

DATA ANALYSIS AND RESULT

4.1 INTRODUCTION

The researcher examines and explains the information gleaned from the widely disseminated questionnaire in this chapter. The data and results that will be provided as tables and straightforward charts were examined by the researcher using SPSS version 28. This chapter will cover the pilot test, descriptive statistical analysis, Pearson correlation, and multiple regression analysis. The analysis will be straightforward and easy to comprehend if the researcher presents the data in an organised and transparent manner, beginning with the most significant findings and working down to the least significant. Before the survey was conducted, the pre-test questionnaire was reviewed and approved by academic lecturers and practitioners in pertinent fields. On 30 respondents, a pilot study to verify Cronbach Alpha was carried out. The NGOS from various organisations in the vicinity of Melaka who were chosen as responders received the questionnaire. The researcher started by looking at the respondents' demographic data and their awareness of the internet of things. The independent and dependent variables are reviewed in the final section of the chapter.

4.2 PILOT TEST

The researcher pre-tested the questionnaire to make sure it was clear and error-free. The questionnaire was reviewed by a lecturer and a specialist in a pertinent topic to help the researcher identify errors in the questionnaire production process, such as sentence structure, typography, and spelling. This pre-goal test's is to lessen survey participants' perplexity, which could result in inaccurate analytical results. In addition, 30 people received the pilot test.

The Cronbach's Alpha of pilot test showed in the Table 5 below:

Case Processing Summary

		N	%
Cases	Valid	30	100.0
	Excluded[a]	0	.0
	Total	30	100.0

a. Listwise deletion based on all variables in the procedure.

(Source: SPSS Output)

Table 5: Case Processing Summary

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.716	.679	16

(Source: SPSS Output)

Table 6: Reliability Statistic

The Cronbach's Alpha result for the pilot test is 0.716. According to this test, lead time efficiency and cost efficiency are all essential variables to help achieve the goal. Therefore, 0.7 is an acceptable number according to Cronbach's alpha's reliability index.

4.3 DESCRIPTIVE STATISTICS ANALYSIS

In order to find out about the demographic information that could be entered into the data, the respondents were generally introduced in this section of the questionnaire. The questionnaire that was given out received 103 responses in total.

4.3.1 GENDER

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	MALE	46	44.7	44.7	44.7
	FEMALE	57	55.3	55.3	100.0
	Total	103	100.0	100.0	

Table 7 : Gender

(Source: SPSS Output)

Based on Table 7, a total of 103 respondents were reported. The majority of respondents are female (55.3% with 57 respondents) followed by (44.7% with 46 respondents) for those are female.

4.3.2 RACE

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	MALAY	38	36.9	36.9	36.9
	CHINESE	36	35.0	35.0	71.8
	INDIA	29	28.2	28.2	100.0
	Total	103	100.0	100.0	

Table 8 : Race

(Source: SPSS Output)

Based on Table 8, a total of 103 respondents were reported. The majority of respondents are Malay (36.9% with 38 respondents) followed by (35.0% with 36 respondents) for those are Chinese and (28.2% with 29 respondents) are India.

4.3.3 EDUCATION LEVEL

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	CERTIFICATE/DIPLOMA	34	33.0	33.0	33.0
	POST-GRADUATE	12	11.7	11.7	44.7
	DEGREE	57	55.3	55.3	100.0
	Total	103	100.0	100.0	

Table 9 : Education Level

(Source: SPSS Output)

Based on Table 9, a total of 103 respondents were reported. The majority of respondents are degree (55.3% with 57 respondents) followed by (33.0% with 34 respondents) for those are certificate/diploma and (11.7% with 12 respondents) are post-graduate.

4.3.4 TYPE OF ORGANIZATIONAL

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	GOVERNMENTAL	2	1.9	1.9	1.9
	LOCAL NGOS	101	98.1	98.1	100.0
	Total	103	100.0	100.0	

Table 10 : Type Of Organizational

(Source: SPSS Output)

Based on Table 10, a total of 103 respondents were reported. The majority of respondents are local NGOs (98.1% with 101 respondents) followed by (1.9% with 2 respondents) for those are in governmental organizations.

4.3.5 DURATION YOU HAVE BEEN IN SUPPLY CHAIN FIELD

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1-5	47	45.6	45.6	45.6
	6-10	44	42.7	42.7	88.3
	11-20	9	8.7	8.7	97.1
	20 ABOVE	3	2.9	2.9	100.0
	Total	103	100.0	100.0	

Table 11 : Duration You Have Been In Supply Chain Field

(Source: SPSS Output)

Based on Table 11, a total of 103 respondents were reported. The majority of respondents (45.6% with 47 respondents) followed by (42.7% with 44 respondents) for those are 6 to 10 years , (8.7% with 9 respondent) for those are 11 to 20 years, and (2.9% with 3 respondents) for those aged 20 and above.

4.3.6 ARE YOU FAMILIAR WITH THE IDEA OF HUMANITARIAN RELIEF AID

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	YES	100	97.1	97.1	97.1
	NO	3	2.9	2.9	100.0
	Total	103	100.0	100.0	

Table 12 : Duration You Have Been In Supply Chain Field

(Source: SPSS Output)

Based on Table 12, a total of 103 respondents were reported. The majority of respondents are familiar with the idea of humanitarian relief aid (97.1% with 100 respondents) followed by (2.9% with 3 respondents) for those are not familiar with the idea of relief aid of humanitarian relief aid.

4.3.7 WHEN LEAD TIMES ARE ACCURATELY CALCULATED AND UNDERSTOOD BY BOTH PARTIES, HO CAN OPERATIONALLY PLAN FOR LIMITED OR ZERO DOWNTIME.

Q1T

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	N	5	4.9	4.9	4.9
	A	68	66.0	66.0	70.9
	SA	30	29.1	29.1	100.0
	Total	103	100.0	100.0	

Table 13 : When lead times are accurately calculated and understood by both parties, HO can operationally plan for limited or zero downtime.

(Source: SPSS Output)

Based on Table 13, a total of 103 respondents were reported. The majority of respondents are agree with the idea (66.0% with 68 respondents) followed by (29.1% with 30 respondents) for those are strongly agree with the statement and only (4.9% with 5 respondents) are neutral.

4.3.8 FASTER LEAD TIME CAN MAINTAIN HO LOYALTY AND POSITIVELY IMPACT FUTURE REVENUE

Q2T

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	N	3	2.9	2.9	2.9
	A	45	43.7	43.7	46.6
	SA	55	53.4	53.4	100.0
	Total	103	100.0	100.0	

Table 14 : Faster Lead Time can maintain HO Loyalty And Positively Impact Future Revenue

(Source: SPSS Output)

Based on Table 14, a total of 103 respondents were reported. The majority of respondents are strongly agree with the idea (53.4% with 55 respondents) followed by (43.7% with 45 respondents) for those are agree with the statement and only (2.9% with 3 respondents) are neutral.

4.3.9 TYPICALLY CUSTOMER (HO) WANT GOOD OR SERVICE AS FAST AS POSIBBLE WITH MINIMUM EFFORT

Q3T

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	N	4	3.9	3.9	3.9
	A	28	27.2	27.2	31.1
	SA	71	68.9	68.9	100.0
	Total	103	100.0	100.0	

Table 15 : Typically Customer (HO) Want Good Or Service As Fast As Possible With Minimum Effort

(Source: SPSS Output)

Based on Table 15, a total of 103 respondents were reported. The majority of respondents are strongly agree with the idea (68.9% with 71 respondents) followed by (27.2% with 28 respondents) for those are agree with the statement and only (3.9% with 4 respondents) are neutral.

4.3.10 FINANCIAL IS ONE OF THE MOST FACTORS THAT MUST BE CONSIDER ON MAKING ANY DECISION TO CHOOSE ANY PARTNER

Q1C

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	N	6	5.8	5.8	5.8
	A	50	48.5	48.5	54.4
	SA	47	45.6	45.6	100.0
	Total	103	100.0	100.0	

Table 16: Financial Is One Of The Most Factors That Must Be Consider On Making Any Decision To Choose Any Partner

(Source: SPSS Output)

Based on Table 16, a total of 103 respondents were reported. The majority of respondents are agree with the idea (48.5% with 50 respondents) followed by (45.6% with 47 respondents) for those are strongly agree with the statement and only (5.8% with 6 respondents) are neutral.

4.3.11 FINDING THE. BEST SOURCING CAN AVOID ABUNDANT OF UNNECESSARY RESOURCES

Q2C

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	N	1	1.0	1.0	1.0
	A	50	48.5	48.5	49.5
	SA	52	50.5	50.5	100.0
	Total	103	100.0	100.0	

Table 17: Finding The Best Sourcing Can Avoid Abundant Of Unnecessary Resources

(Source: SPSS Output)

Based on Table 17, a total of 103 respondents were reported. The majority of respondents are strongly agree with the idea (50.5% with 52 respondents) followed by (48.5% with 50 respondents) for those are agree with the statement and only (1.0% with 1 respondents) are neutral.

4.3.12 GREATER DONATION AND SUPPORT TO HO STILL DO NOT SOLVE THE ISSUES AT ALL WHICH FORCE HOs TO PURSUE ACCOUNTABILITY BY IMPROVING THEIR EFFECTIVENESS AND EFFICIENCY IN TIME AND COST

Q3C

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	N	2	1.9	1.9	1.9
	A	44	42.7	42.7	44.7
	SA	57	55.3	55.3	100.0
	Total	103	100.0	100.0	

Table 18: Greater Donation And Support To HO Still Do Not Solve The Issues At All Which Force HOs To Pursue Accountability By Improving Their Effectiveness And Efficiency In Time And Cost

(Source: SPSS Output)

Based on Table 18, a total of 103 respondents were reported. The majority of respondents are strongly agree with the idea (55.3% with 57 respondents) followed by (42.7% with 44 respondents) for those are agree with the statement and only (1.9% with 2 respondents) are neutral.

4.3.13 THE MOST IMPORTANT PERFORMANCE MEASUREMENT THAT SHOULD BE FOCUSING BY ANY HUMANITARIAN ORGANIZATION ARE LEAD-TIME EFFICIENCY AND COST EFFICIENCY

Q1H

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	N	3	2.9	2.9	2.9
	A	53	51.5	51.5	54.4
	SA	47	45.6	45.6	100.0
	Total	103	100.0	100.0	

Table 19: The Important Performance Measurement That Should Be Focusing By Any Humanitarian Organization Are Lead Time Efficiency And Cost Efficiency

(Source: SPSS Output)

Based on Table 19, a total of 103 respondents were reported. The majority of respondents are agree with the idea (51.5% with 53 respondents) followed by (45.6% with 47 respondents) for those are strongly agree with the statement and only (2.9% with 3 respondents) are neutral.

4.3.14 PERFORMANCE MEASUREMENT THROUGH INTEGRATION CALLED PERFORMANCE MANAGEMENT PROCESS IS THE KEY TO ENABLING HOs AND THEIR PARTNER TO ACHIEVE THE LEAD TIME EFFECTIVENESS AND COST EFFICIENCY

Q2H

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	N	4	3.9	3.9	3
	A	45	43.7	43.7	47
	SA	54	52.4	52.4	100
	Total	103	100.0	100.0	

Table 20 : Performance Measurement Through Integration Called Performance Management Process Is The Key To Enabling HOs And Their Partner To Achieve The Lead Time Effectiveness And Cost Efficiency

(Source: SPSS Output)

Based on Table 20, a total of 103 respondents were reported. The majority of respondents are strongly agree with the idea (52.4% with 54 respondents) followed by (43.7% with 45 respondents) for those are agree with the statement and only (3.9% with 4 respondents) are neutral.

4.3.15 THE ABILITY OF THE HOs TO MAINTAIN THE MOVEMENT OF SUPPLIES, DATA, FINANCIAL SERVICES, PEOPLE AND UNDERSTANDING DURING THE PREPAREDENESS STAGE IS CRITICAL TO THE SUCCESS OF THE RESPONSE STAGE IN ADDRESSING URGENT PROBLEMS DURING AND AFTER DISASTER

Q3H

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	N	2	1.9	1.9	1.9
	A	36	35.0	35.0	36.9
	SA	65	63.1	63.1	100.0
	Total	103	100.0	100.0	

Table 21: The Ability Of The Hos To Maintain The Movement Of Supplies, Data, Financial Services, People And Understanding During The Preparedness Stage Is Critical To The Success Of The Response Stage In Addressing Urgent Problems During And After Disaster

(Source: SPSS Output)

Based on Table 21, a total of 103 respondents were reported. The majority of respondents are strongly agree with the idea (63.1% with 65 respondents) followed by (35.0% with 36 respondents) for those are agree with the statement and only (1.9% with 2 respondents) are neutral.

4.4 DESCRIPTIVE ANALYSIS OF THE RELATIONSHIP VARIABLES

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation	Skewness		Kurtosis	
	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Std. Error
Gender	103	1	2	1.55	.500	-.218	.238	-1.992	.472
Age	103	1	4	1.85	.809	.726	.238	.081	.472
Race	103	1	3	1.91	.806	.161	.238	-1.439	.472
EducationLevel	103	1	3	2.22	.917	-.462	.238	-1.668	.472
TypeofOrganizational	103	1	2	1.98	.139	-7.069	.238	48.920	.472
Durationyouhavebeeninsupplychainfield	103	1	4	1.69	.754	1.006	.238	.861	.472
AreyoufamiliarwiththeideaofHumanitarianReliefAid	103	1	2	1.03	.169	5.683	.238	30.901	.472
Q1T	103	3	5	4.24	.533	.163	.238	-.244	.472
Q2T	103	3	5	4.50	.558	-.538	.238	-.770	.472
Q3T	103	3	5	4.65	.555	-1.325	.238	.828	.472
Q1C	103	3	5	4.40	.600	-.431	.238	-.650	.472
Q2C	103	3	5	4.50	.522	-.192	.238	-1.491	.472
Q3C	103	3	5	4.53	.539	-.520	.238	-.954	.472
Q1H	103	3	5	4.43	.553	-.237	.238	-.949	.472
Q2H	103	3	5	4.49	.575	-.573	.238	-.641	.472
Q3H	103	3	5	4.61	.528	-.868	.238	-.419	.472
Valid N (listwise)	103								

4.4.1 LEAD-TIME EFFICIENCY

	N	Minimum	Maximum	Mean	St. Deviation
Q1T	103	3	5	4.24	0.533
Q2T	103	3	5	4.50	0.558
Q3T	103	3	5	4.65	0.555

Table 22: Descriptive Analysis for Lead-Time Efficiency

From table 22, the finding reveals that the maximum mean value was (M=4.65) with the items on Q3T. The standard deviation value is 0.555. Meanwhile, the lowest mean value shows the item on Q1T, which the value (M=4.24) and the standard deviation was 0.533. The minimum rating scale for each item was 3 and the higher rating scale was 5.

4.4.2 COST EFFICIENCY

	N	Minimum	Maximum	Mean	St. Deviation
Q1C	103	3	5	4.40	0.600
Q2C	103	3	5	4.50	0.522
Q3C	103	3	5	4.53	0.539

Table 23: Descriptive Analysis for Cost Efficiency

From table 23, the finding reveals that the maximum mean value was (M=4.53) with the items on Q3C. The standard deviation value is 0.539. Meanwhile, the lowest mean value shows the item on Q1C, which the value (M=4.40) and the standard deviation was 0.600. The minimum rating scale for each item was 3 and the higher rating scale was 5.

4.4.3 HUMANITARIAN RELIEF AIDS IN MALAYSIA

	N	Minimum	Maximum	Mean	St. Deviation
Q1H	103	3	5	4.43	0.553
Q2H	103	3	5	4.49	0.575
Q3H	103	3	5	4.61	0.528

Table 24: Descriptive Analysis for Humanitarian Relief Aid in Malaysia

From table 24, the finding reveals that the maximum mean value was (M=4.61) with the items on Q3H. The standard deviation value is 0.528. Meanwhile, the lowest mean value shows the item on Q1H, which the value (M=4.43) and the standard deviation was 0.553. The minimum rating scale for each item was 3 and the higher rating scale was 5.

4.5 INFERENTIAL ANALYSIS

4.5.1 Pearson's Correlation Analysis

How closely two variables are related to one another is determined by the Pearson Correlation Coefficient. The table below shows the strength of the correlation coefficient.

Coefficient Range	Description of Strength
±0.81 to ±1.00	Very Strong
±0.61 to ±0.80	Strong
±0.41 to ±0.60	Moderate
±0.21 to ±0.40	Weak
±0.00 to ±0.20	Weak to no relationship

Table 25: Strength of The Correlation Coefficient (Hair et al., 2010)

The independent and dependent variable use in this study are as follow:

a) Independent Variables: Lead-Time Efficiency and Cost Efficiency

b) Dependent Variable: Humanitarian Relief Aids in Malaysia

Correlations

		MEANTIMEEFFICIENCY	MEANCOSTEFFICIENCY	MEANHRA
MEANTIMEEFFICIENCY	Pearson Correlation	1	.369**	.496**
	Sig. (2-tailed)		.000	.000
	N	103	103	103
MEANCOSTEFFICIENCY	Pearson Correlation	.369**	1	.364**
	Sig. (2-tailed)	.000		.000
	N	103	103	103
MEANHRA	Pearson Correlation	.496**	.364**	1
	Sig. (2-tailed)	.000	.000	
	N	103	103	103

**. Correlation is significant at the 0.01 level (2-tailed).

Table 26: Result of Correlations Analysis for All Variable

(Source: SPSS Output)

Remarks:

LTE: Lead-Time Efficiency

CE: Cost Efficiency

HRA: Humanitarian Relief Aids

The Parson Correlation Analysis of independent variables and dependent variables is shown in Table 26. Every independent variable, such as lead-time efficiency and cost efficiency has a significant two-tailed connection with humanitarian relief aids at 0.1 level. First lead-time efficiency is having moderate positive relationship with the value 0.496. So its shown the result is Moderate. Secondly, cost time efficiency is having a weak positive relationship with the value of 0.364. So its shown that the result is Weak. All of these independent variables and dependent variables are needed to achieved the objectives. According to the research, the most significant between independent factors and humanitarian relief aids is lead-time efficiency (0.496) followed by cost time efficiency (0.364).

4.5.1.1 Relationship between lead time efficiency on the humanitarian relief aid in disaster supply chain in Malaysia

Correlations

		MEANTIMEEFFICIENCY	MEANHRA
MEANTIMEEFFICIENCY	Pearson Correlation	1	.496**
	Sig. (2-tailed)		.000
	N	103	103
MEANHRA	Pearson Correlation	.496**	1
	Sig. (2-tailed)	.000	
	N	103	103

**. Correlation is significant at the 0.01 level (2-tailed).

Table 27: Result of Correlations Analysis for Time-Lead Efficiency

(Source: SPSS Output)

Lead- time efficiency has a great significant two-tailed connection with humanitarian relief aids at 0.1 level. Lead-time efficiency is having moderate positive relationship with the value 0.496. So its shown the result is Moderate

4.5.1.2 Relationship between cost efficiency on the humanitarian relief aid in disaster supply chain in Malaysia

Correlations

		MEANHRA	MEANCOSTEFFICIENCY
MEANHRA	Pearson Correlation	1	.364**
	Sig. (2-tailed)		.000
	N	103	103
MEANCOSTEFFICIENCY	Pearson Correlation	.364**	1
	Sig. (2-tailed)	.000	
	N	103	103

**. Correlation is significant at the 0.01 level (2-tailed).

Table 28: Result of Correlations Analysis for Cost Efficiency

(Source: SPSS Output)

Cost efficiency has a great significant two-tailed connection with humanitarian relief aids at 0.1 level. Cost time efficiency is having a weak positive relationship with the value of 0.364. So its shown that the result is Weak

4.5.2 Multiple Regression Analysis

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.533[a]	.284	.270	.26415	.284	19.817	2	100	.000

a. Predictors: (Constant), MEANCOSTEFFICIENCY, MEANTIMEEFFICIENCY

b. Dependent Variable: MEANHRA

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	2.766	2	1.383	19.817	.000[b]
	Residual	6.978	100	.070		
	Total	9.743	102			

a. Dependent Variable: MEANHRA

b. Predictors: (Constant), MEANCOSTEFFICIENCY, MEANTIMEEFFICIENCY

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Correlations			Collinearity Statistics	
		B	Std. Error	Beta			Zero-order	Partial	Part	Tolerance	VIF
1	(Constant)	1.887	.432		4.367	.000					
	MEANTIMEEFFICIENCY	.383	.083	.418	4.594	.000	.496	.417	.389	.864	1.158
	MEANCOSTEFFICIENCY	.203	.088	.210	2.303	.023	.364	.224	.195	.864	1.158

a. Dependent Variable: MEANHRA

Table 29: Multiple Regression Analysis

(Source: SPSS Output)

Table 29 shows that the R is 0.533, indicating that the independent variables (lead-time efficiency and cost efficiency) were associated and relevant to the humanitarian relief aids study's objective. Furthermore, the R square value is 0.284, implying that the overall variation in achieving the objectives with humanitarian relief aids is 28.4 percent. Only 71.6 percent of was not affected.

F= 19.817 with p= .000 according to the ANOVA table. As a result, the model's fit has been confirmed. The entire regression model, which include two constant: lead-time efficiency and cost efficiency which has done a good job of explaining humanitarian relief aid.

Based on Table 29, the beta for lead-time efficiency and cost efficiency 0.418 and 0.210 respectively. Based on beta, all variables have a positive relationship as, the researcher notice that there is no independent variable with negative sign, which has negative relationship with humanitarian relief aids. The constant is 1.887. Therefore, the researcher formed the following equation:

$$Y = A + Bx1 + Bx2 + Bx3 + Bx4$$

Where:

Y= Dependent Variable

A= Constant from coefficients table = Independent Variable

x = Beta, B value

Bx1 = Lead-Time Efficiency

Bx2 = Cost Efficiency

Humanitarian Relief Aids = 1.887 + 0.383 (Lead-Time Efficiency) + 0.203 (Cost Efficiency)

When the lead-time efficiency of use increases one unit and the other variables remain constant, the linear equation shows that the humanitarian relief aid in disaster will grow 0.283 units. Following that, when cost efficiency increases by one unit and the others stay same, humanitarian relief aids will grow by 0.203 units.

4.6 HYPOTHESIS ANALYSIS

In this regression analysis, independent variables included lead time efficiency and cost efficiency whereas dependent variables humanitarian relief aid. Because the significance value is less than 0.05, the hypothesis can be maintained. Finally, if the significance value for the independent variable is greater than 0.05, the independent variable has no effect on the dependent variable.

Hypothesis 1:

There is a significant relationship between lead time efficiency and humanitarian relief aid in disaster supply chain in Malaysia.

Based on Table 29, the relevant value of lead time efficiency is .000, which is below p-value of 0.05. From that lead-time efficiency has significance relationship on humanitarian relief aids. Moreover, alternative hypothesis $H1_1$ is accepted.

Hypothesis 2:
There is a significant relationship between cost efficiency and humanitarian relief aid in disaster supply chain in Malaysia.

Based on Table 29, the relevant value of lead time efficiency is .000, which is below p-value of 0.05. From that cost efficiency has significance relationship on humanitarian relief aids. Moreover, alternative hypothesis $H1_1$ is accepted.

4.7 CONCLUSION

The researcher utilized SPSS software version 28 to accomplish all the data analysis and interpretation in this chapter. There are 103 respondents in the data that must be analysed. the association between lead-time efficiency and cost efficiency for humanitarian relief aids was found enough. As a result, the two hypothesis provided in this study were explained. In the next chapter, we'll go further about the other facts.

CHAPTER 5
CONCLUSION AND RECOMMENDATION

5.0 INTRODUCTION

This chapter discusses the descriptive analysis's findings as well as the study's goal as determined by the SPSS output. The implications of the research will be presented along with a thorough conclusion. This chapter summarises the descriptive analysis, discusses the results, and discusses the key implications of the research. This section will briefly summarise the conclusions and justifications for the conclusions drawn from prior research. It will be separated into two parts to address the following study objectives:

i. To determine performance measurements required in the HSC's mobility stage to reach lead time effectiveness and cost-efficiency.

ii. To implement a recommended continuous improvement process, aligning vision and mission, willing to trust one another, utilizing IT technologies, improving language, and implementing standardization in HSC.

5.1 RESEARCH SUMMARY

5.1.1 RO1: TO DETERMINE PERFORMANCE MEASUREMENTS REQUIRED IN THE HSC'S MOBILITY STAGE TO REACH LEAD TIME EFFECTIVENESS AND COST-EFFICIENCY.

The first objective of this study is to identify the factors of lead-time efficiency and cost efficiency of humanitarian organizations. Organizations are motivated to perform better because of performance measurement (Ferreira et al., 2012). The process of acquiring data, processing it, and reporting it over a predetermined point might be characterised as performance measurement (Behn, 2003). Evaluations of how successfully organization manages and deliver their value to stakeholders and customers are also included in performance measurement (Neely et al., 2002). Performance measurement also covers the process of evaluating the efficacy and efficiency of previous actions (Moullin, 2002). The goal of

performance measurement is to convey the idea that all businesses track their own performance and that this data is utilised to define goals (Behn, 2003). As an illustration, the goal of HOs assessing performance in humanitarian operations is to add value by mitigating the calamity that happened (Moullin, 2002; Behn, 2003). Humanitarian studies, according to D'Haene et al. (2015), have emphasised the necessity for HOs to assess their performance. Performance measurement is used by HOs to increase donations (by highlighting major issues to donors), strengthen various stages of disaster management, particularly the preparedness stage, and improve relief efforts (Van Wassenhove, 2006; Beamon and Balcik, 2008).

Additional goals of performance assessment include evaluation, control, budgeting, inspiration, promotion, celebration, learning, and process improvement (Behn, 2003). A potential strategy for raising an organization's value and achieving its goals is performance measurement (Widera and Hellingrath, 2011)..

In order to pursue customer happiness and help firms run their operations efficiently and effectively, many supply chain performance indicators have been offered in the business sectors that are more closely tied to financial indicators (Daz-Delgado and Iniestra, 2014). The performance indicators for non-profit organisations like HOs are more closely related to non-financial measures, such as the number of human sufferings in operations spanning from mitigation, preparedness, reaction, and rehabilitation (Ibid).

Organizational procedure, learning and evaluation, the HO's mission, and feedback are the performance indicators that HOs and the partners will need to track in order to increase lead time effectiveness in the preparedness stage. Budgeting, fund management, sourcing, organisational procedure, learning and evaluation, funding, the objective of the HO, and feedback are among the performance indicators needed by HOs and their partners to increase cost effectiveness in the preparation stage.

iii. 5.1.2 RO2: TO IMPLEMENT A RECOMMENDED CONTINUOUS IMPROVEMENT PROCESS BY UTILIZING IT TECHNOLOGIES, IMPROVING LANGUAGE, AND IMPLEMENTING STANDARDIZATION IN HSC.

The second objective is to implement a recommended continuous improvement process by utilizing IT technologies, improving language and implementing standardization in HSC. Multiple regression analysis coefficients were used to achieved this objective.

By using coefficient of multiple regression analysis from table 29 the first highest beta value is cost efficiency which is 0.383. This is due to cost efficiency is the main thing that must be implemented to ensure that the effectiveness of humanitarian relief aid in supply chain become more efficiency and smoother. And lastly the is lead-time efficiency with a beta value of 0.203. In nut shell, these two factors gave a positive value between the factors and the humanitarian relief aids in Malaysia.

Furthermore, the researcher can see through the multiple regression analysis coefficient which is there is positive significance and for the summary from table 29 Annova F value is 19.817 that means the predictor (constants, lead-time efficiency and cost efficiency) has a positive multiple relationship with the dependent variable being used among NGOs in Melaka.

5.3 LIMITATION OF STUDY

Due to the limited scope of this thesis, the findings cannot be extrapolated to apply to the totality of the humanitarian industry all over the world. This is due to the fact that the number of cases that were investigated for this study being so little in contrast to the total number of cases that have been seen in the industry. Because of this, making generalisations about the elements or metrics that should be evaluated would require the collecting of additional data on a more extended scale. Because of this, it is necessary to undertake an investigation into a variety of other types of pair relationships, such as those between customers and suppliers, etc. The researchers were able to arrive at their conclusions thanks to the empirical data they collected during the course of the investigation as well as, to a certain extent, their own individual perceptions.

5.4 IMPLICATION

The researcher used descriptive analysis and multiple regression analysis to test two variables, lead-time efficiency and cost efficiency, to see if they have a relationship with humanitarian relief aids. Based on the results above, the researcher can say that all objectives have been met. It may also be used to describe a finding or a study conclusion. The researcher discovered that humanitarian relief aids is crucial in other parts based on the recommendations.

The goal of this study is to examine how HOs would be able to manage their lead times and costs better through focused performance measurements strengthened by the incorporation of important information flows between partners of the same HSC. However, as stated in the following section, HOs and HSC's ultimate objective is not to turn a profit but rather to use the donations that have been donated to them to assist the community that is in danger. And because this project calls for improved donation administration, it contains this value.

5.6 FUTURE RESEARCH AND RECOMMENDATION

Because of the pressing need to act as quickly as possible, many HOs still aren't aware of how crucial it is to operate preparedness operations in a cost-effective manner. In addition, many HOs place a greater emphasis on later stages, such as the response stage, rather than earlier stages, such as the preparedness stage, even though they are aware that improved preparedness will boost the HOs' capabilities to carry out subsequent stages, such as the rehabilitation stage. Therefore, additional research should be conducted to raise awareness of cost efficiency, which can have a significant impact on their performance, particularly in terms of meeting the needs of the beneficiaries while working within limited budgets, as well as raising awareness of the significance of the stage of the disaster management cycle known as "preparedness."

In order to improve the speed with which actions are released as well as the efficiency and effectiveness of their interactions with their partners, it is necessary to encourage HOs to make use of information and communication technology (ICT), to standardise their processes, and to enhance the quality of the international language. In addition, there are certain HOs who recommend looking into the sustainability component, which can add additional knowledge to

the research that will be done in the future regarding how the connection can maintain the ties between HOs and other parties.

In conclusion, there is always potential for development, which is made possible by the insightful considerations of HOs and partners, in addition to the lessons learned during the thesis. Indeed, humanitarian organisations (HOs) and their partners need to improve research in humanitarian operations by establishing research departments and recruiting outside consultants and researchers who are passionate about their work. In conclusion, the following points serve as a summary of some proposals for more research that may be done:

I. Ensure that the study is both clear and comprehensive and keep the analysis from becoming overly specialised or overly broad. This will increase the likelihood that the findings of the study will be adopted by HOs and the partners with whom they work.
II. Other suggestions for further research include increasing awareness of cost efficiency, increasing awareness of the importance of the preparedness stage in the disaster management cycle, increasing awareness of IT utilisation, improving language, and bringing aspects of sustainability into the study.

5.6 CONTRIBUTION

This work contributes to the existing body of knowledge regarding HSC and has implications for both theory and practise in the field. A theoretical contribution is made by the study in the form of an evaluation and improvement of the performance of disaster preparedness in terms of the effectiveness of lead time and the cost efficiency. Along the same lines, the purpose of this study is to improve the HSC theory by developing a performance management method for the disaster preparedness stage of the humanitarian supply chain and integrating it with the partners.

5.7 CONCLUSION

The purpose of this study was to gain a deeper understanding of the factors that influence the degree to which HO is influenced by lead-time efficiency and cost efficiency. This research has proven to be successful in accomplishing the objectives of the study as they were initially defined. The researcher has revealed in this chapter the challenges they had while doing the research throughout the period of data collection. Because of this limitation, the researcher offers a number of ideas for further investigation. In addition to this, the researcher identified each target individually based on previous research. In conclusion, it is necessary to make use of all of the independent variables in order to keep the activities of any HO organisations running well. These factors include the effectiveness of both the lead-time and the cost efficiencies.

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UNIVERSITI TEKNIKAL MALAYSIA MELAKA

Questionnaire

Research Title: Improved Lead Time Efficiency and Cost Efficiency in the Humanitarian Relief Aid in Disaster Supply Chain in Malaysia

Dear Sir/Miss/Madam

Thank you for taking part in this research. My name is Aqilah Syahirah Bt Jamaludin, and I am a bachelor's degree student from the Faculty of Technology Management and Technopreneurship (FPTT), University Technical Malaysia, Malacca. The objective of this survey is to investigate the relationship between lead-time efficiency and cost efficiency in the Humanitarian Relief Aid in Disaster Supply Chain in Malaysia. The information obtained from this survey will be kept confidential and will solely be used for academic purposes. This questionnaire comprises of three sections. Please read the questions carefully before you answer them. I would be most grateful if you could take about 5-10 minutes to complete this short questionnaire. Thank you very much for your willingness and cooperation. If you have any question or concern about the study, you may contact me through the following:

Phone No:

Email address:

Supervisor: MISS ATIKAH SAADAH BINTI SELAMAT

Supervisor's email address:

Section A: Demographic Background

Please tick (√) in the boxes provided and fill in your details.

1) Gender

	Male
	Female

2) Age

	18-30
	31-40
	41-50
	51-60

3) Race

	Malay
	Chinese
	India
	Other:

4) Education Qualification:

	SPM/O Level
	STPM/A-Level
	Certificate/Diploma
	Degree
	Post-graduate

5) Type of Organizational

	Governmental
	Local NGOs
	International NGOs
	UN affiliated

6) Duration you have been in supply chain field

- [ ] 1-5 years
- [ ] 6-10 years
- [ ] 11-20 years
- [ ] 20 years above

7) Are you familiar with the idea of Humanitarian Relief Aids:

- [ ] Yes
- [ ] No

SECTION B : LEAD TIME EFFICIENCY AND COST EFFICIENCY / BAHAGIAN B: KECEKAPAN MASA UTAMA DAN KECEKAPAN KOS

Instruction: This section aims to gather information from your viewpoint on the Lead time efficiency and cost efficiency Please read the following questions and respond by selecting the appropriate number from the accompanying 5-point Likert scale. / *Arahan: Bahagian ini bertujuan untuk mengumpul data terhadap kecekapan masa utama dan kecekapan kos dalam pengetahuan anda. Sila baca setiap soalan dan beri jawapan anda dengan memilih nombor yang sesuai mengikut skala Likert lima mata yang disediakan:*

(1) Strongly Disaagree / *Sangat Tidak Setuju*

(2) Disagree / *Tidak Setuju*

(3) Neutral / *Neutral*

(4) Agree / *Setuju*

(5) Strongly Agree / *Sangat Setuju*

Humanitarian Organization (HO)

Humanitarian Organizations. Humanitarian NGOs aid people who are suffering, particularly victims of armed conflict, famines, and natural disasters. Sometimes these organizations are also called relief societies

Lead Time Efficiency and Cost Efficiency

Lead time in supply chain management only refers to the amount of time it takes a supplier company to have products ready for delivery. Cost efficiency is the practise of reducing costs by improving a product or process. The goal of doing this is to increase the bottom line of the company by lowering procurement costs and increasing overall efficiency.

LEAD TIME EFFICIENCY / *Kecekapan Masa Utama*

The question below are related to the lead time efficiency towards the humanitarian relief aid in disaster in Malaysia. / *Soalan di bawah adalah berkaitan dengan kecekapan masa utama terhadap bantuan kemanusiaan dalam bencana di Malaysia.*

	Section B1: Lead Time Efficiency	SD	D	N	A	SA
1.	When lead times are accurately calculated and understood by both parties, HO can operationally plan for limited or zero downtime.					
2.	Faster lead time can maintain HO loyalty and positively impact future revenue.					
3.	Typically customers (HO) want goods or service as fast as possible with minimal effort.					

COST EFFICIENCY / *Kecekapan Kos*

The question below are related to the cost efficiency towards the humanitarian relief aid in disaster in Malaysia. / *Soalan di bawah adalah berkaitan dengan kecekapan kos terhadap bantuan kemanusiaan dalam bencana di Malaysia.*

	Section B2: Cost Efficiency	SD	D	N	A	SA
1.	Financial is one of the most factors that must be consider on making any decision to choose any partner					
2.	Finding the best sourcing can avoid abundant of unnecessary resources.					

3.	Greater donation and support to HO still do not solve the issues at all which force HOs to pursue accountability by improving their effectiveness and efficiency in time and cost.					

SECTION C: HUMANITARIAN RELIEF AID IN DISASTER IN MALAYSIA / *BAHAGIAN C: BANTUAN BANTUAN KEMANUSIAAN DALAM BENCANA DI MALAYSIA*

Instruction: This section aims to gather information from your viewpoint on the humanitarian relief aid in disaster in Malaysia. Please read the following questions and respond by selecting the appropriate number from the accompanying 5-point Likert scale. / *Arahan: Bahagian ini bertujuan untuk mengumpul data terhadap bantuan bantuan kemanusian dalam bencana di Malaysia Sila baca setiap soalan dan beri jawapan anda dengan memilih nombor yang sesuai mengikut skala Likert lima mata yang disediakan:*

(1) **Strongly Disaagree** */ Sangat Tidak Setuju*

(2) **Disagree** */ Tidak Setuju*

(3) **Neutral** */ Neutral*

(4) **Agree** */ Setuju*

(5) **Strongly Agree** */ Sangat Setuju*

Humanitarian Relief Aid

While development aid responds to persistent structural problems, particularly systemic poverty, that may impede economic, institutional, and social development in any given society, it also helps in building capacity to ensure resilient communities and sustainable livelihoods. Humanitarian aid is intended to save lives and relieve suffering during emergencies and in the immediate aftermath.

	Section C: Lead Time Efficiency	SD	D	N	A	SA
1.	The most important performance measurement that should be focusing by any humanitarian organization are lead-time efficiency and cost efficiency.					

2.	Performance measurement through integration called performance management process is the key to enabling HOs and their partners to achieve the lead time effectiveness and cost efficiency.					
3.	The ability of the HOs to maintain the movement of supplies, data, financial services, people, and understanding during the preparedness stage is critical to the success of the response stage in addressing urgent problems during and after disasters.					

APPENDIX B

Gantt Chart of Final Year Project (FYP) 1

WEEK/ ACTIVITIES	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**
FYP talk																
Search for FYP topic																
Meeting with supervisor																
Topic discussion																
Title confirmation																
RO & RQ Construction																
Submission Chapter 1																
Submission Chapter 2																
Submission Chapter 3																
First draft of FYP 1																
Submission of FYP 1																
Presentation 1																
Revised of FYP 1																

MID SEMESTER BREAK

APPENDIX C

Gantt Chart of Final Year Project (FYP) 2

WEEK/ ACTIVITIES	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**
Create Questionnaire									MID SEMESTER BREAK					
Distribute Questionnaire														
Collect Questionnaire														
Analysis Data														
Submission Chapter 4														
Submission Chapter 5														
Proposal Correction														
Slide Preparation														
Submission of FYP 2														
Presentation 2														