Development of New Frameworks, Standards and Principles via Delphi Data Collection Method

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Abstract: *This study explains of Delphi method which is the one of the qualitative data collection systems, especially for development the new concepts, standards and frameworks. These developments be capable of the knowledgeable people/experts who employ with the relevant fields of the particular studies. Delphi method collects the data from the above knowledgeable experts and its run number of times to search out the correct answer of the research problem. This study used the Delphi for collecting data for developing a corporate social responsibility (CSR) framework in Sri Lanka. On methodology, study ` out two rounds with twenty experts and identify the real issues on corporate and the society. Also the study identified five CSR elements and 28 CSR activities for the developed framework. The Delphi is the most accurate and reliability scientific method for data collection. Its reliability and validity is automatically checked when the method runs two or more than two times. On conclusion, the Delphi can be utilised for the new frameworks development, standards and new concepts development because it is getting the new ideas from the experts' people, and their ideas can be discussed and commented among the interview people of the study.*

Keywords: Delphi method, CSR, Experts, Framework, Reliability

1. Introduction

New frameworks, standards and principles development are common in research and academic field. First it is needed to identify the exact objectives of the particular standards and principles, and then needs to identify the knowledgeable people regarding the field of the relevant subject. Others experience plus knowledge is very important to develop the index standards and principles for the future researchers and scholars. This study's task is to identify a significant method to data collection to develop the above concepts, standards and indices. Many CSR studies adopted the Delphi method [1; 2] to investigate the principles of corporate citizenship. The detailed information of the Delphi is described in this paper with the exemplar of the researchers' doctoral study. Further this study has confirmed the CSR studies which they have adopted the Delphi method for developing the new frameworks, standards and concepts.

[2] who developed a CSR framework which distinguishes company owners, human resources, customers, suppliers, government and competitors. The aim of this framework was to facilitate the management of stakeholder issues, rather than to establish or implement the principles of CSR. Another CSR framework was discussed by [1] based on the stakeholder approach and containing 20 principles categorised into three groups; ethical business behaviour, stakeholder commitment and environmental commitment. She describes the stakeholder commitments, including commitments to communities, employees, investors and suppliers, as a major component of her CSR model, which was developed using the Delphi method. [3] used the Delphi method for the development of the CSR framework for developing world like Sri Lanka, as did [1]. Delphi method is introduced for the development for new task, such as concepts, frameworks, and principles, and it is used to develop the CSR framework for the Sri Lankan public sector organisations to understand the unique theme regarding the CSR.

The four major types of mixed method designs described in the literature [4] are triangulation, embedded, explanatory and exploratory approaches. Exploratory research design can be categorised into two models: firstly, instrument development (quantitatively emphasised), and secondly, taxonomy development (qualitatively emphasised). One of the major problems presented in this study, the lack of a guiding CSR framework in the Sri Lankan context was mentioned [3]. In order to redress this problem, an exploratory design has been used in the present study. This can be described under the instrument development model as explained by [4]. The study begins qualitatively, as this approach is best suited for investigating a phenomenon. Further, an exploratory design is most suited to investigating or expanding and analysing a mechanism when one is not available [4], or to determine the significant variables to study quantitatively (p. 75). In the present study a CSR framework, developed using the Delphi method was designed. Using qualitative data (interviewed data) the researcher attempted to develop a framework.

2. The Delphi Method

The Delphi method used in this study is designed to allow experts to exchange ideas [5; 1; 6] These researchers have pointed out that the Delphi method investigates solutions for a particular problem. The original Delphi method was designed in 1950 by Norman Dalkey to solve issues in the Rand Corporation in the US. The objective of his study was to identify and discuss reliable views from experts in the company. Later, [7] used this technique in his research aimed at overcoming military issues. Since then, many researchers have utilised the Delphi technique in their studies. Table 1 below shows the users of Delphi and their views of this method.

As the current study aims to develop a new framework for CSR in Sri Lanka, the Delphi method was utilised for primary data collection. According to Linstone and Turoff (1975, cited in [8], the Delphi technique overcomes the limitations of the other forecasting methodologies (p.31), such as relying on a single expert, which causes forecasting problems. Others simply average the forecasts of several experts, and there are also methods relying on round-table

discussion and group agreement which may be influenced by group members in high positions.

[9] and [10] demonstrated that the four characteristics of Delphi include participants being able to communicate their opinions freely and anonymously. They are informed of the other participants' perspectives and provided with the opportunity to clarify or change their views. Finally, a quantitative analysis was carried out on the data that was collected to allow an interpretation of the data. [1] applied the Delphi method to develop a Corporate Social Performance (CSP) framework based on the stakeholder approach. The current study will apply Delphi methodology to design a CSR framework for the Sri Lankan context based on a similar approach. The present study used Linstone and Turoff's (1975, cited in [8] Delphi techniques for collecting the data and their data analysis methods were adapted to analyse the data.

Table 1: Users of the Delphi methods

Users of Delphi	What is Delphi?
Norman Dalkey (1950)	The designer of the original Delphi method. The US Air Force commissioned the Rand Corporation to conduct a Delphi study
Olaf Helmer (1967)	Supported the validity and reliability of the technique as an acceptable method of data collection
Linstone and Turoff (1975)	A method for structuring a group communication process, so that the process is effective in allowing a group of individuals, as a whole, to deal with a complex problem
Häder and Häder (1995, p. 12)	A relatively strongly structured group communication process in which matters on which naturally unsure and incomplete knowledge is available, are judged upon by experts
Rowe and Wright (1999)	Key characteristics of Delphi: anonymity of participants iteration; controlled feedback; statistical aggregation of group response
Kurth-Schai et al. (2000, p. 96)	Unlike more conventional survey methods the goal in selecting Delphi panels is not to develop a random sample representative of the general public. Instead, a purposive sampling approach is adopted
Ogden et al. (2005)	The Delphi method as one of three different research efforts
Zami and Lee, 2009	Key features of Delphi: systematic; questionnaire; expert opinion; iterative process; feedback; anonymity of participants .

Source: Adopted from the literature

Advantages & disadvantages of the Delphi technique: [8] pointed out that the anonymity of the Delphi technique provides the advantages of utilising multiple experts while avoiding the pitfalls of bias transfer and pressure' (p. 31). Table 2 below shows the advantages of the Delphi methods for collecting data for research studies.

Table 2: Strengths of Delphi technique

Strengths	Authors
The process gives participants time to think through their ideas before committing themselves to them, leading to a better quality of response.	Rowe and Wright 1999; Garrod 2008; Linstone and Turoff 1975; Skulmoski et al. 2007
The potential influence of personality is removed.	Garrod 2008; Linstone and Turoff 1975; Skulmoski et al. 2007
Redundant noise (issues that tend to sidetrack the debate) can be controlled by the project manager.	Linstone and Turoff 1975; Garrod 2008; Andranovich 1995; Rowe and Wright 1999
The process generates a record of the group's thoughts, which can be reviewed as required.	Rowe and Wright 1999; Garrod 2008; Linstone and Turoff 1975; Skulmoski et al. 2007
The method can be used to evaluate the spread of opinion as well as consensus points.	Rowe and Wright 1999; Garrod 2008; Linstone and Turoff 1975; Skulmoski et al. 2007
The anonymity of Delphi participants allows them to freely express their opinions without undue social pressures to conform from others in the group.	Rowe and Wright 1999; Garrod 2008; Linstone and Turoff 1975; Skulmoski et al. 2007
The technique is flexible enough to be applied in a variety of situations and to a wide range of complex problems, for which there is often no other suitable means of analysis.	Rowe and Wright 1999; Garrod 2008; Linstone and Turoff 1975; Skulmoski et al. 2007

Source: Adapted from Zami and Lee 2009

In addition to the above advantages, it should be noted that the Delphi technique has several weaknesses [11]. First, the Delphi participants must have written communication skills. Secondly, the Delphi method is labour-intensive and time consuming. For example, if mailed questionnaires are used, it can take from 45 days to over a 12-week period to administer from the start of the study to the completion of the final report. Third, [11] highlighted the need for highly motivated participants, since the quality of the responses depends on the interest and motivation of the respondents. Table 3 shows further limitations of this technique [10].

Table 3: Limitations of the Delphi

Weaknesses	Authors
A Delphi study is at the mercy of the world view and biases of the coordinating or monitor team, who choose the respondents, interpret the returned information and structure the questions. There is a great deal of debate therefore, over whether this coordinating group should be chosen from within or outside the organisation initiating the study and whether they should be experienced in the subject area of the study in question.	Masini 1993
It has not been shown consistently that the results of this method are any better than those achieved through other structured judgmental techniques.	Rowe and Wright 1999
The flexibility of the technique means it can be adapted to a whole range of situations, which in turn can make it vulnerable to misrepresentation and sloppy execution.	Amara and Future 1975
In the process of achieving consensus, extreme points of views run the risk of being suppressed when in fact they may provide important new information or insights.	Lang 1995
The process of choosing the panellists is often not considered seriously enough, even though it is the calibre of the panellists that determines the quality of the outcomes of the study.	Lang 1995
Certain questions are not asked as they do not seem important when the study begins. However, once it is underway new questions cannot be added can weaken the study considerably.	Simmonds 1977
The way the process and questionnaire is structured can lead to a bias (like IG tests), which assume a certain cultural background. People may give responses they think the monitoring group wants to hear, or they may not respond at all. Thus, the cultural background of respondents will impact upon the results.	Linstone 1978

Source: Adapted from Zami and Lee 2009

The Delphi Process: [12] explained that conventional Delphi studies follow a certain process. According to [12], researchers should use a clear criterion to select a panel of participants and design a well-structured questionnaire concerning the problems and issue(s) under consideration. The experts (respondents) are then asked to respond to the questionnaire during a series of rounds (iterations). All responses are provided individually and anonymously. Questionnaires are usually administered in the mail and, in most cases, respondents' identities are unknown to each other. They interact only with the researcher or a small research team (two to four members) conducting the process. Between rounds, panellists are provided with descriptions of previous individual and group responses (controlled feedback). The group opinion is generally expressed in the form of statistical indices, a measure of central tendency (usually the median response) and a measure of dispersion (usually the inter-quartile range).

The framework development process on this study involved the following steps:
1. Identification of the CSR practices in Sri Lanka and related issues, by examining the annual reports of 10 selected companies a pilot study.
2. Development of an interview questionnaire and selection of 10 organisations and 20 experts for collecting data using the Delphi method.
3. Interviewing the 20 selected experts.
4. Content analysis of the qualitative data.
5. Circulation of the results of the content analysis between the respondents to fine-tune the first round data of the Delphi process using a questionnaire, followed by rating the responses on a 5-point Likert scale.
6. Analysis of the final data using a descriptive statistics technique

3. Methodology

The Delphi method used for data collection in this study was made up of two rounds. In the first round, the 20 participants were involved in semi-structured face-to-face interviews to identify the social and environmental expectations of

Panellists are frequently asked to submit comments and/or justification of their personal views for review by the researchers. These are often summarised and reported in subsequent iterations. The Delphi process has been explained in different studies [13; 14; 8]. These are summarised in Table 4 below.

Table 4: Common Delphi process

Steps	Activity
1	Define the problem
2	Select willing expert participants
3	Structure the initial questionnaire
4	Interview Questionnaire I: initial input
5	Combine and refine the initial predictions
6	Interview Questionnaire 2: fine-tune Step 5
7	Further analysis

Sources: Adapted from Ogden, Petersen et al. 2005

business organisations in Sri Lanka. The data were analysed using content analysis.

Sample Identification

It is extremely important to firstly identify who should be included in the interview sample. The participants will provide all the information required to address the research questions. As it is not feasible to engage all members of a relevant population, the selection of survey participants is crucial. To improve the selection of the participants in this study, the following steps were taken, as outlined below.

Defining the Population

The first step in the sample selection is to define the population. For this study, the population chosen was the companies and organisations that practice CSR in Sri Lanka. This population is represented by different government organisations, non-government organisations and listed companies. Within this population, the Ministry of Labour represents employees and the Consumer Development Authority represents customers.

Sample Size

20 participants were selected from 10 organisations directly engaged with the stakeholders of companies included employees, customers, members of the general public and environmentalists in the present study. The employees were selected by the Ministry of Labour in Sri Lanka; while the customers were selected by the Consumer Development Authority of the Sri Lanka. These organisations' major activities are related to social services, for example, the Ministry of Labour works to protect employees and ensure their rights. Due to this careful selection process, overall the study sample represents the population required for the study.

Sample Error and Bias

Sample errors occur when estimates are derived from a sample rather than a population census. This is the source of the main difference between the sample population and the population of interest. Because the sample number is considerably smaller than the total population, sample errors due to inadequate representation of the total population may occur [15]. To minimise these errors, Castillo suggested to test the entire population. Accordingly, the present study included six groups population, therefore the entire population in all six groups including all employees; customers; environmentalists; education workers; health workers and the general community. The six groups identified in pilot study which was done by the researcher. To avoid bias in sampling, systematic random sampling was used as the best method to obtain unbiased variance estimators as suggested by [16] Murthy (1967). There are three models of random sampling: simple random, stratified and multi-stage cluster sampling [17].

Sample size in Delphi studies

There is no agreement on sample size for Delphi studies [22;18;6]. According to [19] there is no evidence for an ideal sample size and no rationale for selecting the sample size. Other studies claim that virtually any panel size is useful. Many published Delphi studies have used panels consisting of 10–100 or more panellists. For example, 13 experts were utilised to study the behaviours of young children and a sample of 10 experts evaluated health promotion interventions [19]. Furthermore large numbers of participants have also been adopted for different studies using the Delphi method; for example, The University of Virginia used 421 respondents, and one study invited 2,865 participants with 1,142 responding to their questionnaires [20;21;19].

The Delphi Questionnaire

The initial interview questions in the Delphi questionnaire were structured around the six content areas identified in the literature review and pilot study: employees, educational, health, customers, the public and the environmental. The results of the pilot study showed that Sri Lankan organisations implement CSR based on stakeholder relationships including employees, educational, health, customers, the general public and the environmental. The sample included 20 experts who work as the top managers in the organisations, selected by the researcher under represented on six categories such as education, health, environment, employees, consumers and society. Based on the pilot study, the first round of Delphi asked respondents to describe existing CSR programmes being implanted by the organisations and develop the possible basic CSR strategies or scenarios based on the identified CSR areas.

In this study, actual data gathering began with the first round of Delphi in which 17 semi-structured interviews were conducted. These ranged from 30–90 minutes in duration, with an average length of 60 minutes each. The participants were employed as executives, senior managers and managers. Each participant had a good knowledge of social responsibility practices and was familiar with stakeholder expectations. Further, as they were leaders who make decisions in the relevant social and environmental fields, they were identified experts in their fields. Notes were taken during each interview and five interviews were audio-recorded in the respondents' mother tongue. Seven interviews were recorded in English and 15 interviews were not recorded, because the respondents requested that their views were not recorded.

Open-ended questions

Each respondent was asked a series of open-ended structured questions, depending on his or her area of expertise. The interview questions covered basic CSR requirements and current CSR practices in Sri Lanka. For example, the study chose the Education department as one of the sample organisations and asked one senior manager 'What social and environmental expectations do you have from the companies that operate in Sri Lanka?' The other sample organisations answered the same question and then reviewed all the responses describing current CSR ability and knowledge.

Measurement tests

Measurement testing is one of the main steps in social research and questionnaire analysis is the process of translating concepts into measurable variables [22]. As validity and reliability are the two major issues that a researcher must take into consideration when using data collection or measurement instruments, this study uses the following validity and reliability tests, in accordance with the literature.

Validity of Instruments

Validity tests must be conducted to determine whether the study truly measures what it intended to measure and how accurate the research results are. For the present study, validity was determined by asking pretested questions relating to the study of CSR in Sri Lanka. The instrument demonstrated that many people had little knowledge of the topic, and therefore the research questions were clearly worded and easy to understand. Examination of other similar studies determined appropriate wording for the questions and the elements necessary to provide an answer to each specific aspect of the study. The interview questionnaire was also pre-tested by a number of academics. The second round of the Delphi questionnaire was developed on the basis of the experts' responses to the first round of Delphi interview questions. The second round questionnaire was distributed to the same respondents, and thus the validity of the second round questionnaire was tested by the respondents

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themselves. Wrong or biased questions were criticised and items were weighted according to the respondents' indications.

Reliability of the Instrument

The interview questionnaire was designed to identify current CSR practices and to assist in developing a potential CSR framework. The questions were developed in accordance with the experts' fields of interest. In addition, some questions were not CSR-related. For example, _what do you think about the social responsibility of organisations, how they implement it and why they organise it'? After completion of the interviews, all answers were matched with the second round questionnaire and analysed using a statistical method.

Data Analysis

As discussed earlier, following the first round of Delphi interviews the data collected were analysed. Transferring qualitative information from a questionnaire onto a computer program (such as N-vivo 9) was accomplished by assigning codes. These codes were predetermined and categorised in the six stakeholder elements. Following this, the second round questionnaire was structured according to these codes and rated under the five point Likert scales. Participants were asked to rate the likelihood of each CSR relation occurring in the future, using this 5-point Likert scale (5 = most important, 4 = somewhat important, 3 = important, 2 = less important, 1 = not at all important). Descriptive analysis was then used to analyse the results on the basis of the CSR framework of the study.

4. Conclusion

The Delphi research technique was used to collect the data for this study. Two survey methods were employed; the first used interviews, while the second round used a survey questionnaire. Twenty expert respondents were selected from 10 government and non-government organisations in Sri Lanka. These data were used to develop a CSR framework after analysis of the data gathered in the interviews and the survey. Content analysis of the experts' opinions were analysed using SPSS descriptive statistics and identified the opinions of the survey respondents. The 28 different CSR activities identified in this study were distributed across these categories. In response to the first research question, the findings from this phase of the study were that CSR activities in the Sri Lankan context relate to six stakeholder groups. These CSR activities were mainly philanthropic and charitable activities, environmental protection initiatives, community responsiveness and corporate sponsorships. The corporate sponsorships were primarily concerned with education- and health-related activities. These latter two activities formed two separate categories in the CSR framework developed in this study.

The framework successfully generated based on the experienced person ideas that was used by the Delphi method. The first round Delphi results refined by the second round Delphi. If the results are difficult to conclude the third round can be used for the final refine. Therefore the validity of the data and the reliability of the data is in the high level of the research studies. Therefore the Delphi technique is the one of the best method for collecting the data for develop the new concept, standards and framework.

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