CHAPTER FIVE

RESEARCH METHODOLOGY

5.1 INTRODUCTION

This chapter consists of two parts. The first part reports the research methods that commences with an explanation of the research perspective, followed by the marketing research perspective of this study. Quantitative data analysis is presented in this part and followed by explanation of designing the questionnaire, employing the methodology, designing the research instrument, and procedure for collection of data will also be viewed in this first part.

Then, an overview of data analysis techniques such as structural equation modeling (SEM) will be explained in the second part of this chapter. The advantages of structural equation modeling (SEM) and the justification for using it are included in this part, followed by a description of the requirements and assumptions of structural equation modeling (SEM) and the evaluation of the overall model.

PART I:
RESEARCH METHODOLOGY: RESEARCH DESIGN AND STRATEGY

The aims of the study are to understand: (1) what components/dimensions of the ethical brand are in the industrial buyers' context; (2) the relationship between the antecedents (product quality, service quality and price perception) and the ethical brand; (3) the effect of the antecedents (e.g. product and service quality, and price) on the company reputation, and subsequently brand loyalty of industrial buyers; and (4) the effect of the ethical brand on company reputation and subsequently brand loyalty. The particular

research hypotheses have been described in the preceding chapter. Hence, beginning from the research perspective of the present research, this chapter attempts to describe the methodological process and the research methods followed.

5.2 THE RESEARCH PERSPECTIVE

5.2.1 Theory Orientation, Epistemological and Ontological Considerations

When carrying out the research plan, researchers generally face a problem in determining the choice of which research programme to apply. For this, Gill and Johnson (1997) explained that the chosen epistemologies supporting the research programme are the key to the selection process in designing the research. According to Gill and Johnson (1997), the research epistemologies consist of (1) positivism and (2) interpretivism.

Research based upon theory orientation consists of: (1) deductive theory; and (2) inductive theory. Bryman (2004) explains that the deductive theory is based on the common perspective of the natural relationship between theory and social research, while the inductive theory is based on the result of research to perform the theory.

On the other hand, consideration of epistemology is linked with the question of what (better is) is regarded as knowledge and could be accepted in a discipline of science. This orientation is divided into two categories: positivism and interpretivism (Denscombe, 2003). Bryman (2004) explains that the research regarding positivism will investigate the social signs and explain the real situation from the new paradigm; while, interpretivism asks the individual to interpret his/her social life.

The last one, the research orientation, will discuss is ontological orientation. According to Bryman (2004), this orientation concerns the nature of social entities, and consists of: objectivism and constructionism. Objectivism is consistent with the viewpoint of positivism. While, constructionism is consistent with the view of interpretivism.

Which method is more powerful depends on the current situation investigated. According to Bryman (2004), if the worldview of a member of a social group is of interest, the qualitative research method may be employed. On the other hand, when the researchers are interested in investigating the relative importance of the different factors of a social phenomenon, the quantitative method may be appropriate. Additionally, Denscombe (2003), similar to Bryman (2004), justified that the method chosen depends on what needs to be carried out and what kind of data is required.

Based upon the above viewpoint, in order to investigate the ethical brand aspects and also its relationship with company reputation and brand loyalty, this study adopts objectivism in its ontological considerations. The current research is thought to employ a positivist quantitative approach methodology adopting the epistemological-positivism in its orientation due to the ethical brand has been argued in previous study as economic, social and environmental responsibilities, but with no empirical evidence and its notion was developed upon previous study. The deductive nature is thus appropriate to test empirical evidence of the ethical brand as a construct and relationships of it at antecedents and outcome (e.g. company reputation and brand loyalty). In other words, this study utilizes a quantitative approach in order to explain the relationship of the current issue (i.e. the ethical brand) in model of this study.

To provide a more accurate explanation the following will discuss the types of research.

5.3 TYPES OF RESEARCH

The research could be classed in two categories: qualitative and quantitative. The research based on the qualitative method is to understand social or human problems from various perspectives. Therefore, it should be noted that the qualitative researcher depicts a broader explanation about the problem related to mutual aims to gain an understanding of the main problem in order to manage it more easily (Denzin & Lincoln, 2000). Thus, qualitative research is an inductive method where the researcher focuses on thoughts to investigate the problem in depth and detail.

On the other hand, Quantitative research is a method that is based on the traditional positivist, that has a trial nature, or empiricist method (Smith, 1983) to investigate the problem in question. This method is based on testing the theory. It is measured in numbers and analyzed by statistical techniques. The quantitative method stresses the objectivity and reproducibility. According to Fraenkel, and Wallen (2003), the aim of this method is to find whether there is an obvious predictive theory generalization or not. In this way the quantitative research is more concerned with the problem of how many, as good, or to whom this problem happened. Furthermore, Kerlinger and Lee (2000) explained that the quantitative research is deductive in nature and stresses on the researcher making conclusions based on observation or direct observation. The main aim is to "depict cause and effect" from a phenomenon.

Based on the above explanation, as the aim of this study is to investigate the effect of the ethical brand on company reputation and brand loyalty of industrial buyer; therefore employing the quantitative method as the research perspective is satisfactory. Furthermore, the following section will discuss specifically the research perspective of the current study.

5.4 THE RESEARCH PERSPECTIVE OF THE STUDY

This study is conducted by quantitative method to investigate the effect of the current issue based upon the industrial buyers' responses. This study uses the survey research method as the quantitative approach, which will be discussed in the following section.

5.4.1 The Quantitative Approach: Survey Research

The quantitative research method is conventional in social science, as explained by Kerlinger and Howard (2000). Therefore, when connected to the current study, it can be stated that this study refers to the quantitative method. This apparently has become a general trend in which research into customer behaviour, marketing and similar, employs the quantitative approach. The quantitative research is useful to explain relationships for various reasons among the variables. The main aim of this study is to see the result that is caused by changing the independent variable to the side of the dependent variable (Kerlinger & Howard, 2000)

Furthermore, when the quantitative method is connected to the theory of orientation as discussed at the beginning of this chapter, it can be stated that this method is close to the epistemological-positivists. In line with the above condition, Bryman (2004) argues that the inductive method cannot give a clear picture concerning a phenomenon that is happening and is, therefore, a weakness of the method. However, because there is an amount of critical pointed to the deduction method, Denscombe (2003) and Bryman (2004) argue that the selection of the best research method really depends on the situation and condition of the study. This argument is in line with Gill and Johnson (1997) who state that selecting the technique or research method depends on what tools

are prepared for use in the analysis, and the important thing is that the aim of the study can be reached significantly.

Because the aim of this study is to determine whether or not the ethical brands and the independent variables (such as the product and service quality, and price perception) influence company reputation and brand loyalty of industrial buyers, the quantitative method approach, adopting epistemological-positivism orientation and objectivism in ontological consideration, is considered satisfactory.

As explained earlier, this study uses the quantitative method by means of a survey research. For this purpose, the questionnaire is the instrument to be used for data collection. The design of the questionnaire for this study is another issue that has to be discussed. The following section will discuss the questionnaire's design to measure each construct used in this study.

5.5 MEASUREMENT OF THE STUDY'S CONSTRUCTS

This section includes discussions of the scales utilized to measure the study's constructs. The construct scale for the current research will be compared to other scales that measure the same construct (Nunnally & Bernstein, 1994). Modifications of scaling needs to be conducted to conform with the current research's objectives. this modification can be accepted by reason of the basic scale has been set up and tested properly, and as long as it does not change significantly the original structure of scaling, the modifications can be made (Chan et al., 1998; Rawwas et al., 1994; and Wee et al., 1995).

The next discussion will present the constructs of the model including definitions, and the operationalizing of the constructs that are proposed. The real structure of the study's questionnaire is presented in Appendixes A and B.

This study has six important variables consisting of Brand Loyalty (BL) as dependent variable, Company reputation (CR) and the ethical brand (EB) as mediating variables, Product Quality (PQ), Service Quality (SQ), and Price Perception (Pr) as independent variables. They were measured on a 7-point Likert scale. It was decided to use a 7-point measurement scale for each variable in order to be consistency in measurement. This is in line with Oh and Jeong (1996) whereas they modified the scale from a 5-point scale to utilize a 7-point scale to measure product and service quality based upon the study conducted by Parasuraman et al. (1988) in order to be consistency in measurement.

A clearer view of those constructs along with the amount of indicators and references is shown in Table 5.1.

Table 5.1 Constructs, Amount of Indicators and References

No.	Construct	Amount of Indicator	References
1	Product Quality (PQ)	7	Adapted from Crosby et al. (2003), Van Riel et al. (2005)
2	Service Quality (SQ)	8	Adapted from Jayawardhena et al., (2005) and Van Riel et al. (2005)
3	Price Perception (Pr)	5	Adapted from Kukar-Kinney et at. (2006), Lichtenstein et al. (1993), Bolton and Kannan (2000), and Lowengart et al. (2003).
4	Ethical Brand (EB)	12	Adapted from Enderle & Tavis (1998), and Nnorom & Osibanjo (2008).
5	Company reputation (CR)	6	Adapted from Cretu and Brodie (2005)
6	Brand Loyalty (BL)	6	Adapted from Van Riel et al. (2005), and Davis (2003)

Source: Literature review, 2008

5.5.1 Measures of Product Quality

According to Kotler (2003, p.189) *'a product is everything, both favourable and unfavourable, that the people accept in an exchange. Products can be tangible or intangible, a thing or an idea, hardware or software, information or knowledge, a process or procedure, a service or function, or a concept or creation'*.

Crosby, et al. (2003) determined that the main vital element in influencing industrial buyers is quality. In other words, product quality has a significant position in influencing business buyers' behaviour. Thus, the company has to offer a quality dimension in order to increase value to the buyer. Additionally, Crosby, et al. (2003) further clarifies managing the comprehensive attributes of quality dimension is important in gaining a positive responses from the buyers. Crosby et al. (2003) argue that most transactions between buyer and seller are a combination of product and service. The combination needs an evaluation in terms of a merger of the product and service quality dimensions. According to Crosby et al. (2003), dimension of product quality could be described as "performance", "feature", "reliability", "conformance", "durability", and "aesthetics". Thus, product quality has been seen as overall excellence or superiority of product that are described as "performance", "feature", "reliability", "conformance", "durability", and "aesthetics" (Crosby et al., 2003).

On the other hand, in the case of the industrial buyers context, Van Riel et al. (2005) measured the performance or perceived quality of product using four items, namely: (1) Product of brand X is a high quality product; (2) This brand development lead time is excellent; (3) This brand is a dependable and consistent product; and (4) This brand is an innovative product.

However, for various reasons customers buying digital products, such as computers, notebooks, printers, photocopiers, etc, may also consider its performance, features, conformance, durability, and aesthetics (See: Kwahk & Han, 2002; Kim & Han, 2008; and McKay & de Pennington, 2001). For example, the "performance" standard of an electronic product is necessary to control the emission of product radiation protecting public health, as justified by Kwahk and Han (2002). Such performance may impact the economic responsibility in terms of cost reduction for the health of stakeholders, and a safe environment. In terms of "features" of electronic products, according to Kim and Han (2008), features are important for customers as it expresses the design that includes icons and the functionality of the product an its ease of use. Thus, the better features of the product may reduce the time spent when operated. Therefore, it also affects the user's benefit.

Moreover, "specification" of electronic products is seen as the overall structure of the products' specifications including what kind of material it is made from, the quality of the manufacturing process, each component used, and the assembly (McKay and Pennington, 2001). All of these things affect whether the product considers the environmental, and social responsibilities is expressed by less material consumed, or re-used and re-cycled components, and no harm to the social life. "Good durability" was also chosen as an item to measure the quality of a product due to the technological improves very fast leading to a shorter life cycle for the products. Also environmental problem due to the electronic product hazardous is a challenge as reported by Sharma et al. (2007). Therefore, good durability may impact the long-life-use of the product considering not only the environmental responsibility, but also economic responsibility in terms of benefit maximization.

“Aesthetic” on the other hand is another item for measuring product quality. According to Tractinsky et al. (2002) aesthetics are usually seen as non-quantifiable, subjective, and affect-based on experience. These authors justify that aesthetics affect the post-use perceptions, which reflects social psychologists views regarding the effect of physical attractiveness on product value. The item “high quality product” was included as highly-engineered products can be applied to anticipate the negative outcomes for the firm and others stakeholders as mentioned by Anderson and Narus (1990). Thus, the feeling of high quality product perceived by customers will also result in the feeling that the brand considers its responsibilities to stakeholders.

On the other hand, according to McKerlie et al. (2006), producer’s responsibility is an important policy tool, which has the potential to impact materials management systems and drive pollution prevention efforts throughout its entire life cycle, including waste management or recovery at end-of-life. This effort may be expressed by “innovation”. Hence, quality of product is also reflected by its innovation.

Based upon the above considerations, five items from Crosby et al. (2003) and two items from Van Riel et al. (2005) may also be reasonable to measure the quality of electronic office equipment in this study as clearly all the selected items may affect the perception of the ethical brand in considering economic, social and environment responsibilities to stakeholders as justified by Fan (2005).

The scale items derived from previous literature that capture these elements are depicted in Table 5.2.

Table 5.2 A Summary of How Product Quality is Conceptualized and Operationalised

Conceptualization	(Items/Indicators) 10 items	Generated from
Good performance	"Buying brand X because it provides good performance"	
Good features	"Buying brand X due to good features"	
Good specification	"The product specifications of brand X match with our needs"	Crosby, et al., (2003)
Good durability	"Brand X can be operated for long time"	
Aesthetics	"All products of brand X are aesthetic"	
High quality product	"Producing high quality product for all categories"	Van Riel, et al., (2005)
Innovative	"Buying brand X because it is innovative"	

5.5.2 Measures of Service Quality

According to Aaker (1997) service quality is determined by the capability to recommend the buyers on technical and business questions. Service is a customer-oriented outcome. This outcome is produced when a firm acts upon performances that are effort to people or objects. Questionnaire items for the service encounter quality scale are derived from the literature, however, minor modifications are necessary to suit in business-to-business service context (Durvasula et al., 1999).

According to Mehta & Durvasula (1998) the scale constructed by Parasuraman et al. (1988) to measure the SERVQUAL can be employed in a business-to-business context. The modification is needed to be a smaller number of factors from five dimensions of tangibles, responsiveness, assurance, empathy and reliability in order to be suit with the current research's objective (Durvasula et al., 1999). Therefore, Jayawardhena et al. (2005) then measures service quality perceptions (items adopted from Parasuraman et al., 1988) and applies them in a business to business context with some modification.

The items of service quality are specifically conceptualized by “visually appealing physical facilities”, “the appearance of physical facilities is in keeping with the type of service”, “promise to do something by a certain time”, “sympathetic and reassuring”, “dependable”, “can trust employees”, “employees are polite”, “giving personal attention”, and “know our needs”.

On the other hand, compared to Ma and Liu (2004), the typical Information System (IS) department is a service provider and tries to involve user satisfaction as a proxy for quality of the IS department services. In the digital era, more industrial buyers use the digital technology (i.e. electronic office equipment) as explained by Ainin (2005); therefore, to provide information service as additional service is necessary to enhance satisfaction of industrial buyers as Ma and Liu (2004) discovered. This is in line with Van Riel at al., (2005) who report that service is a key factor to industrial buyers; even most professional buyers are willing to pay a premium price for a superior service. According to Van Riel at al. (2005), industrial buyers need online information due to an increased use of Internet impacting the change in business situation. Buyers are able to get more information not only from brochures or sales people, but also from online. This current situation is in line with Kennedy et al. (2001), and Jeong and Lambert (2001) who reported that the revolution in information services has become a strategic point in the current customers behaviour and it can be a significant factor for predicting their decision behaviour. Therefore, providing better information may influence a positive responses of industrial buyer. The results of a study on industrial brand equity, Van Riel et al. (2005), address several significant items that are measured by three dimensions (service personal with four items, information service with five items, and service quality with three items). In detail, these three dimensions consist of eleven items that are conceptualized by “highly skilled personnel”, “well dressed and appear neat”, “trust in the staff”, “willing to help buyers”, “understand our need”, “good

information about product", "good online information", "good information in documentation", "quickly receive supplementary information", "excellent technical support", "good production support", "good development support".

Compared to the previous study of the service quality dimension by Jayawardhena et al. (2004), adapted from Parasuraman at al. (1990), there are some differences and similarities. Van Riel et al. (2005) locates information service that consists of five items to measure service quality in the information era, specifically, to serve industrial buyers using e-commerce. However, Jayawardhena et al. (2004) do not place them into dimensions or items. Another difference is that Van Riel et al. (2005) develops only four items to measure service personal, thus, Jayawardhena et al., (2004) developed it into two dimensions (assurance, and empathy), and each one consists of two or three items. In addition, Van Riel et al. (2005) use three items to measure service quality directly, in terms of facilities supporting, but Jayawardhena et al. (2004) develop them into one dimension, namely, tangible, with two items.

Based on the above discussion, employing measurement from Van Riel et al., (2005) is more relevant for this study, especially the information service dimension that is very crucial in the digital era as explained by Ainin (2005) whereas most industrial buyers use high technology products like electronic equipment for the office. The buyers need more information service from the providers when they are using this type of equipment to support their business. Therefore, information service is important measurement in the current study to be adopted.

Thus, five items of service quality were captured from Jayawardhena et al., (2004) and three items from Van Riel et al., (2005) because those express the information service and excellent personnel service which are usually operationalized in a business buyers context.

In the scale purification process, redundant items were deleted. For example: the items "highly skilled personnel", "well dressed and appear neat", "trust in the staff", "willing to help buyers", "understand our need", were similar with those in dimension of assurance and empathy scale of Jayawardhena et al. (2004). Therefore, this study measures service quality, which comprises eight items. This is similar to Van Riel's et al. (2005) study, which uses eight items to measure service quality (personnel and information service).

The scale items generated from previous literature that capture these elements are depicted in Table 5.3.

Table 5.3 The Summary of How Service Quality is Conceptualized and Operationalised

Conceptualization	(Items/Indicators) 8 items	Generated from
Promise to do by a certain time	"When staff of brand X promise to do something by a certain time, they do so"	Jayawardhena et al. (2004)
Sympathetic and reassuring staff	"When our company has problems, staff of brand X are sympathetic and reassuring"	
Trust employees	"Can trust employees of Brand X"	
Polite employees	"buying brand X as employees of brand X are polite"	
Personal attention	"Employees of brand X give us personal attention"	
Good online information	"Buying brand X because it provides good online information"	Van Riel et al. (2005)
Good documentation	"Buying brand X because it provides good information in documentation"	
Quickly receive supplementary information	"Buying brand X because it quickly provides supplementary information"	

5.5.3 Measures of Price Perception

Price in business markets is what a customer firm pays a supplier firm for its product offering (Anderson et al., 2000). Some researchers used either a single or two items when measuring perception of price (i.e., Cretu and Brodie, 2005).

However, Kukar-Kinney et al. (2006) measure store or brand price perceptions by adapting a scale from Srivastava (1999). The following items are conceptualized by: "compared to its competitors, the overall prices are most likely high", "relative to other electronic stores, the prices are most likely high", "expecting the overall prices to be high", and "prices are likely to be higher than average market prices of the same products". While, Lichtenstein et al. (1993) explain that price in particular influences customer behaviour because it is present in all purchase situations. In cases where price acts as a positive perception of electronic products, it is conceptualized by "higher price signals higher degree of quality", "prestige and/or status". On the other hand, price mavenism also affects the degree of value. Price mavenism according to Lichtenstein et al. (1993) is defined as the degree to which an individual is "a source of price information for every type of product and situation".

Another previous study, by Lowengart et al. (2003), explains the effect of reference price towards customer loyalty. Their study determined that customers used a reference price (RP) in their purchasing decisions, and marketers occasionally used this opportunity to manipulate the RP to increase a good image in the marketplace. This is in line with Bolton and Kannan (2000) who established that contradictory information concerning price can result in diminishing loyal customers. Customers' evaluation uses their internal RP of the brand as a comparison to previous prices paid in that category. When it is evaluated, loyal customers are "less sensitive to price changes" than are non loyal customers.

Based on the above discussion, this study captures five items as the scales to measure price perception. As a comparison, Kukar-Kinney et al. (2006) use four items to measure this construct. However, as price information is also necessary as mentioned by Bolton and Kannan (2000), this study employs another item to measure price perception. Thus, the scale items generated from previous literature that capture these elements are depicted in Table 5.4 as follows:

Table 5.4 The Summary of How Price Perception is Conceptualized and Operationalised

Conceptualization	(Items/Indicators) 5 items	Generated from
Expecting the prices to be high Prices are higher than average market prices	"Our company expects the overall prices of brand X to be high" "Brand X's prices are likely to be higher than average market prices of the same products"	Kukar-Kinney et al. (2006)
Higher price is equivalent to the quality	"Higher price of brand X is equivalent to quality"	Lowengart, Mizrahi, and Yosef (2003)
Good price information The Price is acceptable	"This brand has good price information for every type of product and situation" "The price of this brand is acceptable"	Bolton and Kannan (2000); and Lowengart, Mizrahi, and Yosef (2003)

5.5.4 Measures of the Ethical Brand

In Chapter Four, this study discussed the fair concept of the firm, capturing a number of important aspects: the firm has been seen as a moral actor, considering economic, social and environmental responsibilities, being affect other factor at various levels, and operating in a horizon of uncertainty and change. All these aspects being representative of the firm are interconnected and might be expressed in various degrees (Enderle & Tavis, 1998). The concept is in line with the ethical brand, defining that brand recognizes its environmental, social and economic responsibilities as justified by Fan (2005).

In contrast, the balanced concept viewpoint emphasizes the issue of what the ethical brand must do in economic, social, and environmental terms. By addressing these different responsibilities directly, according to Enderle and Tavis (1998), each can be characterized as follows:

(a) *The economic responsibility* includes numerous items in harmony with the characteristically economic purpose of the firm. Both productive and distributive aspects are appropriate for considering items which are: "Make/maximize profit: in the short term and in the long term", "Improve productivity", "Preserve/increase the wealth of owners/investors", Respect suppliers", "Regard for employees via preserve/create jobs, pay fair wages, provide social benefits, and (re-) educate and empower employees" (Enderle, 1993).

(b) *Social responsibility* on the other hand, refers to *what* the firm is responsible for in the political and sociocultural system of society. Fundamental items are: "Respect the spirit and letter of the law and regulations", "Respect social customs and cultural heritage", "Engage selectively in cultural and political life" as explained by Erlende and Tavis (1998).

(c) The *environmental responsibility* reflects the reality that society is universal. According to Anderle and Tavis (1998), it is expressed as consuming natural resources (as inputs of the firm's production process like raw materials, energy, etc.) and burdening the environment (as outputs such as waste and pollution of various types). In addition, according to Nnorom and Osibanjo (2008), the use of electronic equipments in general will be resulted into waste caused by the disposal products. For this purpose, Nnorom and Osibanjo (2008) suggest that each company should have a programme for recycling materials, recovering the valuable material or products from the waste and the disposal for final placement

or destruction of waste. Considering the ethical brand, the relevant item can be generally stated as: "Consume less natural resources", "Monitor the potential negative impact", "Less burden on the environment with effluents", captured from Enderle and Tavis (1998) and "Recycling the material", "Recovery of the valuable material or product from waste", "Disposal for final disposition, final placement or destruction of waste" captured from Nnorom and Osibanjo (2008).

The scale items generated from previous literature that capture these elements are depicted in Table 5.5.

Table 5.5 The Summary of How the Ethical Brand is Conceptualized and Operationalised

Conceptualization	(Items/Indicators) 12 items	Generated from
Economic Responsibility:		
Make/maximize profit	"Using brand X, because it makes us maximize our profit"	Enderle and Tavis (1998)
Increases the wealth	"Using brand X because the company continually succeeds in increasing the wealth of stakeholders."	
Respect to its supplier	"Company of brand X always respects its supplier."	
Social Responsibility:		
Respect the laws and regulations	"Using brand X because the managers of the organization respects the laws and regulations of the country."	Enderle and Tavis (1998)
Prevent discrimination	"Using brand X because its internal policy prevents discrimination"	
Respects social customs and cultural heritage	"Using brand X that respects social customs and cultural heritage."	
Environment Responsibility:		
Committed to "sustainable development" through consuming less natural resources	"Using brand X because it is committed to "sustainable development" through consuming less natural resources."	Enderle and Tavis (1998)
Monitor the potential negative impacts	"Using brand X because managers of the company monitor the potential negative impact on our community."	
Preserve jobs	"Using brand X that preserves the jobs at a reasonable profit margin and helps its employees to engage in community work."	
Recycling the material	"Using brand X because it has a Recycling programme"	Nnorom, & Osibanjo (2008)
Recover the valuable material	"Using brand X because it has a Recovery programme"	
Disposal for final disposition	"Using brand X because it has a Disposal programme"	

5.5.5 Measures of Company reputation

Company (corporate) reputation has been defined as *'a particular type of feedback received by an organization from its stakeholders concerning the credibility of the organization's identity claims' (Whetten & Mackey, 2002, p.401)*. Therefore, the power of a company reputation can be estimated to be more essential when supported by quality of service.

In the long term, according to Singhapakdi (1999) the success of an organization that represents its reputation can be affected by the ethical business practices. This is because ethical judgments are made by customers, and these judgments are likely to influence the consumers' acceptance or rejection of a company's products (Singhapakdi, 1999). In other words, ethically responsible actions are instrumental for "business success" as being expression of its reputation. The long-term success of the company depends on its integrity, having a tradition of honesty and fair dealing and being ethically responsible towards its stakeholders. In terms of social responsibility, companies follow the laws and regulations of the country, prevent discrimination, and respect social customs and cultural heritage (Enderle & Tavis, 1998). This may affect their reputation as "good corporate citizens" (Cretu & Brodie, 2005).

In addition, according to Mazzanti and Zoboli (2006), the waste and recycling policy can influence the perception of how well the company uses innovation. A company that has a recycling programme may be perceived as environmentally responsible. Such responsibility can affect the perception of customers concerning innovation orientation of the firm. According to Cretu and Brodie (2005), "innovation orientation" represents the company reputation. Therefore, this viewpoint indicates that this responsibility can enhance these scales of a company reputation as "successful company" and "being innovative" regarding customer perception. Further, offering good value for money,

committed to customers, and a clearly defined image as mentioned by Greyser, S.A., (1999) express economic responsibility as the customer focus. "Having customer focus" is also operationalized as company reputation by Cretu and Brodie (2005), and also Greyser (1999).

Consistent with previous literature, as discussed in Chapter Four, this is in line with Cretu and Brodie (2005), therefore, in measuring company reputation, six items can be conceptualized – ''being well managed'', ''being product driven'', ''being successful'', ''being innovative'', ''having customer focus'', and ''being a good corporate citizen''. Basically, these items are derived from studies conducted in marketing and management by Yoon et al. (1993), LeBlanc and Nguyen (1996), Doney and Cannon (1997), Greyser (1999), and Deephouse (2000). These items are then applied by Cretu and Brodie (2005) in a business to business context. Therefore, according to the above discussion, the scale items generated from Cretu and Brodie (2005) are relevant for application in this study. Thus, the scale items generated from previous literature that captures this variable are depicted in Table 5.6.

Table 5.6 The Summary of How Company reputation is Conceptualized and Operationalised

Conceptualization	(Items/Indicators) 6 items	Generated from
Being well managed	"Buying brand X because it is well managed"	
Having customer focus	"Buying brand X because it is customer focused"	
Being a good corporate citizen	"Company of brand X has the reputation of being a good corporate citizen"	Cretu and Brodie (2005)
Being product driven	"Buying brand X because it is product driven"	
Being successful	"Deciding to buy brand x because it is successful company"	
Being innovative	"Deciding to buy brand X because the company is innovation oriented"	

5.5.6 Measures of Brand Loyalty

In business-to-business marketing, loyalty emphasizes on a long-term relationship between firm's customers and its supplier. For example, customer loyalty is described as 'a behavioral intention to continue the current relationship with supplier (Singh & Sirdeshmukh, 2000). In Oliver's (1999) study, loyalty is seen as a deeply-held commitment to re-buy a preferred product/service consistently in the future.

In this study as explained in Chapter Four, brand loyalty is defined as the commitment of the industrial buyer of electronic office equipment to the relationship with the brand's manufacturer. In many literatures, the continuance commitment is most recognized as expression of the industrial brand loyalty (Anderson & Weitz 1992; Kumar et al. 1995; Morgan & Hunt 1994; Kim & Frazier 1997; Nguyen, 2002; and Davis, 2003).

Inspired by Morgan and Hunt (1994), brand loyalty of business buyers is conceptualized by Davis (2003) as expressing the relationship that consists of "very committed to", "intend to maintain indefinitely", "deserves our maximum effort to maintain", "do almost anything to keep", "care a great deal about long term", and "take very little effort to end".

Moreover, measuring brand loyalty of industrial buyers is also tested by Van Riel et al. (2005). According to Van Riel et al. (2005), brand loyalty is conceptualized by "very satisfied with Product X", "very satisfied with Company Y", "recommend Product X", "intend to use Product X again in the future", and "intend to do business again with Company Y in the future".

According to both measurements of brand loyalty, there are dissimilarities even though both are applied in a business-to-business context. Thus, both are possible to apply in this study. However, it needs wise consideration to select which of the above items are the most useful to be applied.

Specifically, in Morgan and Hunt's (1994) study, brand loyalty focuses on the long-term relationship. So, this scale is influenced by the issue of relationship between businesses to business, which is similar with this current study. While, Van Riel et al. (2005) measures brand loyalty through requesting of respondents to indicate how the performance of specific results (products) or company objectively to be recommended and intent to be bought. Rather respondents are asked to indicate how they perceive the branded product and company's performance in comparison to other competing brands sold on the market.

Therefore, two items from Van Riel et al. (2005) are selected as this study focuses on evaluating the brand rather than the company. The two selected items from Van Riel, et al. (2005) are similar to two items from Morgan and Hunt (1994). The purification process to select some appropriate items is used to avoid redundancy.

The scale items generated from previous literature that capture these elements are depicted in Table 5.7

Table 5.7 The Summary of How Brand Loyalty is Conceptualized and Operationalised

Conceptualization	(Items/Indicators) 6 items	Generated from
Committed buyer Maximum effort to maintain Do almost anything to keep Care a great deal about long term	"The relationship our company has with brand X is something we are very committed to" "We use our maximum effort to maintain the relationship with brand X" "We would do almost anything to keep the relationship with brand X" "We care a great deal about our long term relationship with brand X"	Morgan and Hunt (1994) cited in Davis, (2003)
Recommend Intend to use	"If asked, we would recommend product of brand X" "We intend to use product of brand X again in the future"	Van Riel et al., (2005)

The next section will discuss the data collection process that includes the questionnaire structure, pre-testing, pilot testing, method and the sampling design used in this study.

5.6 DATA COLLECTION

5.6.1 The Questionnaire

This part will explain the design of the questionnaire including the structure, content and the format. A structured questionnaire of this study was sent to the respondents to be tested. This can minimize the time and effort of the researcher and avoid bias as they complete the answer sheet and it increases the number of potential respondents to participate in this study. According to Malhorta (2003), the advantages of using this method are that it is simple to administer and the data gathered is reliable. Data is also easy to code, analyze and interpret, and is generally relatively simple and straightforward. Basically, most of the questions are fixed alternative answers that only require the respondents to select from a prearranged set of responses.

The content of this questionnaire is essentially to evaluate the variables that are used in this current study. For the most part the items are the recognized measures from previous studies that are incorporated into this current questionnaire with a few additional items built-in to match the current research perspective. In particular, the items in this questionnaire plan to measure the constructs of industrial buyers' responses towards product and service quality, price, the ethical brand, company reputation and brand loyalty of electronic office equipment in Malaysia. Additionally, a Likert-Scale is applied to most of the questions in this questionnaire. According to Alreck and Settle (1995) the advantages of Likert scaling are that besides being easy to construct and understand it is also flexible and economical in terms of space.

The questionnaire applies the seven point Likert-type scale for the existing items to confine the responses of the respondents in measuring variables. The rationale for using this scale is to base it on the previous research measurement and maintain the consistency of the items throughout the questionnaire. Moreover, it can offer the average option for respondents in case they are indifferent to the questions. This is in line with Malholtra (2003) who justifies that in order to apply the regression or any other advanced statistical techniques, seven or nine point numerical scales are recommended. All statements and questions in section I are formed according to the Likert Scale (1 to 7) with "strongly disagree", "disagree", "slightly disagree", "neutral", "slightly agree", "agree", and "strongly agree" as used in Parasuraman et al. (1988) research.

The questionnaire in the current study consists of nine pages excluding the cover page and is divided into two sections. Instructions are clearly and precisely stated on the first page of each section. Section I of the questionnaire consists of 44 statements that are

intended to measure all the six variables existing in this study. The reason why all the questions are located in one section is to avoid bias when the respondents answer the questions.

Subsequently, Section II contains eight items of information concerning the profile of the company that consist of type of electronic office equipment in use, average age, type of brand, followed by information concerning the primary business of the company, number of employees, company's planning to buy the new electronic office equipment, and the purchase decisions made by the company.

The respondents' profiles are in Section III, which in total contains eight questions. It provides information on the respondents' background, which is important for identifying the respondents' profile. The questions in this section include gender, age, race, level of education, period of working experience, period of employment in company, functional/area, and monthly income.

Furthermore, to investigate whether the questionnaire has any weaknesses, pre-testing is necessary. The explanation of pre-testing of this study will be discussed in the following section.

5.6.2 Pre-testing of the Questionnaire

For the effectiveness of a questionnaire survey it is necessary to pre-test the questionnaire before the real survey. According to Cooper and Schindler (2003) this can help to identify the strengths and weaknesses of the survey according to question format, wording and order.

In general, according to Cooper and Schindler (2003), there are four types of pre-test: *researcher, participant, collaborative and noncollaborative pretests*. Whether the researchers use a participant or noncollaborative pre-test, pre-testing is ideally conducted to test in particular – question variation, meaning, task difficulty, and respondent interest and attention (Converse and Presser, 1986). The writers suggest that the pre-tests should also incorporate any questions borrowed from other similar surveys, even though they have already been pre-tested in the past. This is necessary as meaning can vary or be affected by the particular context of the survey. In addition, researchers are also advised to pre-test the following: flow, order, skip patterns, timing, and overall respondent well-being.

On the basis of the above discussion, this study employs the *Collaborative pretest*. Five experts and practitioners were involved as the participants in the pre-testing of the questionnaire. Those participants were required to argue about wording, question form, order and also timing the length of questions. Based on the result there were a few modifications, especially on question wording in Section I, wording and order in Section II, and wording and order in Section III of this study's questionnaire. Also, a few questions that were not understood and insignificant for a study on company's responses were also excluded. This was because most of the practitioners involved in the pre-testing felt the questions unnecessary. For example, price perception has been scaled by nine items. According to the all practitioners, six items have similar meaning each other. The items were Compared to its competitors, the overall prices of brand X are most likely higher, 'Relative to other electronic brands, the prices of brand X are most likely higher', 'Our company expects the overall prices of brand X to be high', 'Brand X's prices are likely to be higher than average market prices for the same products', 'The higher price of brand X reflects its quality,' and 'Higher price of brand X indicates its prestige'. Therefore, four items were excluded and remained five items

to scale this construct. On the other hand, according academician, the name of constructs should not be appeared in the questionnaires. This suggestion has been addressed and replaced by part A, part B and so on. Moreover, in term of profile respondents, the academician argues to select eight from nine that have been presented and also need to be reworded to express the industrial buyer.

A clearer picture of the questionnaire before and after pre-testing can be seen in Appendixes A and B.

Besides pre-testing of the questionnaire, this study conducted a pilot test that will be explained in the following section.

5.6.3 Pilot Testing

Before sending to the data collection, one pilot test was conducted. The survey was done on a convenience sample of industrial buyers from managerial levels who were involved in the company's buying decisions in order to assess the reliability of the main issues used in the study. Moreover, according to Kaynack and Kara (2002), the pilot test is needed to confirm the clarity, comprehension and consistency of the questionnaire. In addition, it is also very important for the study to understand whether the constructs, especially the ethical brand as a new one, are reliable and valid to proceed to the main survey, because the appropriateness and validity of the scale, particularly for the ethical brand, has not been tested before.

A mail survey was used to assist data collection in Malaysia for three areas (Kuala Lumpur, Selangor, and Negeri Sembilan) from industrial buyers that use electronic office equipment. There were 50 questionnaires received from respondents out of 300 issued. These consisted of 18 respondents in Kuala Lumpur, 23 from Selangor, and the

remaining 9 respondents were from Negeri Sembilan. All respondents are executives involved in buying decision-making. Specifically, in terms of position/job function of respondents, they consist of 2 CEOs, 17 General Managers, 11 Production/Operational Managers, 18 Financial Managers, and 2 Marketing Managers.

Cronbach's Alpha internal consistency measure was used in order to assess the validity and reliability of the items. There were 43 items analyzed using SPSS version 12. Table 5.8 below will show the summary of all the constructs' Cronbach's Alpha values.

Table 5.8 Cronbach's Alpha Values for Pilot Study

	Constructs	**Cronbach's Alphas**
1	Product Quality	.862
2	Service Quality	.872
3	Price Perception	.780
4	Ethical Brand	.876
5	Company reputation	.735
6	Brand Loyalty	.851

Based on the table above, results from this initial stage indicate that the six constructs have a high level of internal consistency. These results appear consistent with previous studies where they have been adopted in a business-to-business context. For example, in a recent study by Van Riel et al. (2005), the internal consistencies were as follows: product quality (.83), personnel service quality (.86), information service quality (.92), and loyalty (.89). Cronbach's Alpha of company reputation as reported by Cretu and Brodie (2005) was .84, and price perception .84 as reported by Kukar-Kinney et al. (2006).

Thus, because the scale expressed its reliability (internal consistencies ranging from .876 for service quality to .735 for company reputation), the full scale was considered acceptable to proceed into the actual research.

5.6.4 The Main of Actual Data Collection

The main of actual data collection in this study is survey. Surveys in research generally are utilized to determine specific characteristics from a group of respondents (Fraenkel & Wallen, 2003) and measure the attitude and the respondents' opinion towards a certain problem (Ary et al., 2002). The survey can be carried out through various methods including the post or mail, telephone, personal interview, even online by respondents filling in a questionnaire.

Data collection through Internet (online) surveys is more popular in marketing research. This method used the Internet to process sending, filing, and receiving responses from respondents. There are some advantages if data collection is conducted online, namely: (1) sending questionnaires is faster compared to by post (Aaker et al., 1998; and Kent & Lee, 1999); (2) it is faster to receive responses and feedback (Aaker et al., 1998; Illieva et al., 2002; Kent & Lee, 1999; Schuldt & Totten, 1994; and Shannon & Bradshaw, 2002); (3) it is cheaper compared to data collection by post (Aaker et al., 1998; Illieva et al., 2002; and Schuldt & Totten, 1994); (4) no agents are needed as messages are sent directly to e-mail addresses (Aaker et al., 1998); and (5) it is not similar to a telephone survey as messaging online can be sent, read, and responded to easily online (Aaker et al., 1998). Moreover, it takes less time to enter data (Lazar & Preece, 1999), and answers from online respondents are more detailed than from mail replies. Referring to the explanations above, Sheehan and McMillan (1999, p.45) argue that *'Numerous researchers have recognized the benefits that e-mail provides over postal mail'*.

However, many critics have pointed out that research conducted online, such as samples, are not representative and generalized (Curasi, 2001; Dommeyer & Moriaty, 2000; McDaniel & Gates, 1999; and Witte et al., 2000). Those critics are correct if the

population are not Internet users as they do not have the opportunity to be elected as respondents. However, Data collection online will be representative if the population are Internet users (de Vaus, 2002).

The population of this research is industrial buyers that use electronic office equipment in operating their business. Questionnaires will be sent to companies through their e-mail addresses. They are invited by e-mail to fill in the questionnaires.

To avoid the low response rate from the email survey method, this study also carried out a survey using the regular mail method. The use of this method is considered as besides being a low-cost method, it is also a one-person job (Cooper & Schindler, 2003).

Moreover, according to Cooper and Schindler (2006), respondents to online surveys usually have limited access time to complete, and participants cannot break off to look for more information that is appropriate to answer the required question. However, with the mail survey method, the respondent can spend more time in achieving accuracy through discussions with staff or other managers.

According to Cooper and Schindler (2006), to increase the mail survey return, the study carried out several actions including follow-ups. This is carried out by means of sending further information to respondents as reminders as well as a preliminary notification where participants are contacted by telephone to enquire whether they are prepared to participate in the survey.

Further, other techniques commonly conducted by researchers were also applied in the current study, such as providing return envelopes, a stamp and also deadline dates. As reported by some researchers and concluded by Cooper and Schindler (2006), these techniques can increase the response rate.

This is relevant to this study as the respondents are the purchase decision-makers or those that participate in purchasing electronic equipment; therefore, respondents who fill in the questionnaire are expected from the high/middle manager level or the purchasing Manager. Thus, they are the target sample in the current study.

Based on the above explanation, combining the online and mail survey methods can be considered in this study as it becomes strong and appropriate to avoid a low response rate from respondents and it can be considered as representative in data collection.

5.6.5 Population and the Study Sample

The population of this study is companies using electronic office equipment in Peninsular Malaysia, and for which data on the companies that registered along with mail and e-mail addresses is available. Table 5.9 shows the distribution of companies with an e-mail address:

Table 5.9 Registered Companies with Mail and E-Mail Address

No.	Area	Total
1	Johor	827
2	Kedah	131
3	Kelantan	41
4	Kuala Lumpur	2014
5	Malaka	216
6	Negeri Sembilan	107
7	Pahang	51
8	Penang	619
9	Perak	332
10	Perlis	74
11	Selangor	2299
12	Terengganu	66
	Total	**6777**

Source: Companies Commission of Malaysia, 2007

According to the Companies Commission of Malaysia (2007), the number of registered companies in the abovementioned states is approximately 1,684,148. About 6,777 of

them are registered along with mail and e-mail addresses. The sample size will be 20 percent of the population. Therefore 1,356 is the sample size.

Basically, there are two ways to define sample size, namely, (1) it is according to the research budget and time available, and (2) if budgeting and time are limited, the first way would be chosen. Thus, Roscoe (cited in Sekaran, 2000) state that the sample size commonly used in social science research is more than 30 and less than 500. If the sample is divided into sub-samples, the minimum sample is 30 samples for each category. While, Sudman (1983) argues that the sample size for attitude research is between 400 to 1,000 respondents, and the optimum number is as many as 700 respondents.

Thus, according to Roscoe and Sekaran (2000), and Sudman's (1983) arguments, and by referring to the minimum requirement, it can be concluded that the sample size for this study of about 1,356 respondents is more than sufficient.

5.6.6 Sampling Method

Research conducted through the Internet (online) may not use the probability sample technique because the probability technique can only be used if *'each element of the population has a fixed probabilistic chance of being selected for the sample' (Maholtra, 1996, p.364)*. However, it does not mean that research cannot define the population based on the sample in which data collecting is done through the Internet (Lazar & Preece, 1999). Thus, to use probability sampling it must define the sample of population well, so that it can construct a sampling frame (Dillon, et al. 1990).

Because the sample of population in this study cannot be defined well as the sample difference from the population remains unknown, and there is not a fixed probabilistic

chance of being selected for the sample as mentioned by Maholtra (1996), this study uses the non-probability sample technique.

Because this study is conducted by non-probability sample technique as mentioned above, in terms of the method of sampling, quota sampling is employed. According to Malhotra (2003), *'quota sampling is seen as two-stage restricted judgment sampling. Quotas or developing control categories is the first stage where the researchers list relevant control characteristics and determine the distribution of characteristics in the target population' (p. 323)*. Moreover, Malhotra (2003) explains that the relevant control characteristics are evaluated on the basis of judgment and Quotas are seen as the proposition of the sample elements based upon the control characteristics. In the second stage convenience or judgment sampling is employed to select the required number of subjects from each stratum.

This sampling method is employed in this study as there are characteristics that must be fulfilled, as in the first stage this study identifies the stratums and proportions as samples that represent the population. This differs from stratified sampling, where the stratums are filled by random sampling.

The chosen sampling for this study must have sufficient experience with the buying decision of electronic office equipment; therefore, respondents were selected according to the following criteria:

(1) The respondents only include companies that are registered with the Companies Commission of Malaysia and have mail and e-mail addresses.
(2) The respondents are on a managerial level and the required condition is for them to be directly responsible for buying electronic office equipment.

(3) Only the companies that use electronic office equipment are chosen for this survey.

If the chosen respondent does not match with any one of the above criteria or is unwilling to participate in the survey, the respondent cannot be a participant in this study. Therefore, before the questionnaire was distributed, the respondents were selected by the screening questions. Previous research based on criteria with other characteristics and perspectives is also reported by Wolfinbarger & Gilly (2003); Cretu & Brodie (2005); and Van Riel et al. (2005).

5.6.7 Respondent and Product Selection

One of the main focuses in this study is to explore the effects of the ethical brand construct among industrial buyers in Malaysia towards the purchase of electronic office equipment. Thus, industrial buyers are the respondents for this study. How to select the right participant from industrial buyers that use the equipment is one of the major issues in this research. Subjects' knowledge that is involved in purchasing plays an important role in participants' information processing and decision making. If the respondent has little experience in evaluating and buying decisions relating to electronic office equipment, the result could be meaningless and the main objectives of the research might not be accomplished. Therefore, the CEO, General Manager or an appointed representative such as a Senior Manager or a manager at the high/middle management level who has sufficient experience in buying decisions were chosen as respondents for this study.

Furthermore, electronic office equipment was chosen as the product selection for this study for several reasons. As mentioned in Chapter One, electronic equipment contains a high level of nickel, lead, accumulators, mercury-switches, glass from cathode-ray

tubes and other activated glass or polychlorinated biphenyl-capacitors, and may be contaminated with cadmium, mercury, lead, nickel, chromium, copper, lithium, silver, manganese or polychlorinated by phenyls, or other toxic elements that render them as hazardous waste when disposed of. According to Nnorom and Osibanjo (2008), all of these things will affect the quality of the environment as waste. This matter becomes an ethical issue as it has an adverse effect on the quality of life because of the waste. Therefore, all companies producing electronic equipment are required to solve this matter through applying recycling and disposal programmes. As this relates to the ethical brand, which is the main focus of this study, the selection of electronic office equipment as the product in this study is appropriate.

Additionally, in the digital era when confronted with increasingly sharp competition, company strategies must change as companies cannot avoid using digital equipment to undertake their business (Ainin, 2005). More companies are investing in the production of digital equipment due to the number demanding electronic equipment; consequently, various brands exist on the market. One of the focuses of the current study is to explore the customers' responses towards the existing brands on the market; therefore, the choice of electronic office equipment as the product selection for this study is quite relevant and representative in studying branding.

In addition, the current study selected 12 types of electronic office equipment based on the pre-investigation of several companies to identify common types of electronic products used. Therefore, the 12 types are included in this research area. They are computer servers, desktop computers, notebook computers, dot matrix printers, laser printers, photocopiers, scanners, multi-function products, multimedia projectors/LCD projectors, electronic white boards, PBX/PABX (Phone-line Switches), and fax machines.

Furthermore, the theory of customer involvement, as reported by Hawkins et al. (2004), suggests that customers are involved by motives need, such as excitement, anxiety, passion, engagement, and flow in the selecting process. When customers are highly involved with a purchase, they are willing to spend more effort in considering the product or brand. In other words, the more involvement, the more amount of time and money they will spend, and the more brands that they will consider. For electronic products (i.e. electronic office equipment) as a complex product, customers need to spend a lot of energy in brand selection in terms of the high involvement in the buying process, and be more careful in the buying decision. Thus, such product categories with a high customer involvement are perceived to have great differences among the existing brands. To evaluate which brand will be selected; customers always consider several aspects, such as product and service quality, price, and even reputation as their references in the decision making process.

Furthermore, customers often consider their favourite brand and brand loyalty. Therefore, electronic office equipment as product selection in the current study is based on the rationale that electronic office equipment categories are high technology products with a complex condition (Kotler, 2003; Hawkins et al., 2004). Customers have many considerations in their buying decision, they always have their favourite brand and many of them are loyal towards a certain brand.

Based upon the above explanation, electronic office equipment as the product selection in this study can fulfil the main focus in evaluating customers' response on the ethical brand and its effect on industrial buyers' responses (i.e., company reputation and loyalty).

5.6.8 Data Collection Process

Questionnaires in the current study were sent by both mail and e-mail to gather the data from industrial buyers. Before sending the questionnaires, first, respondents were sent a letter requesting permission to ask whether the respondent is agreeable to participate in the study or not. Then, the letter of permission was sent together with the questions from the screening process to ensure that they met the agreed criteria, and also the option of their preferred survey method (mail or online). If the respondent selects the questionnaire to be sent via mail, it is sent to them along with a return envelop and stamps to facilitate its return and minimise inconvenience. The first follow-up is through a letter as a reminder that contains the deadline, which is sent via mail and online as suggested by Cooper and Schindler (2003). Another follow-up is also conducted via telephone calls for those who still do not respond.

The above technique is applied in this study in order to gather sufficient responses from industrial buyers. This method is also recommended by Huang (2003) and Anderson at al., (2000).

5.6.9 Response Rate and Representativeness

Marketing research is generally interested in explaining the response rate arising from a lack of response relating to poor cooperation from the respondents (Bachman et al., 2000). As summarized in Table 5.10, there were 1,356 questionnaires issued via the Internet and mail for twelve districts in Peninsular Malaysia, in the proportion of 165 in Johor, 26 in Kedah, 8 in Kelantan, 403 in Kuala Lumpur, 43 in Malaka, 21 in Negeri Sembilan, 10 in Pahang, 124 in Penang, 66 in Perak, 15 in Perlis, 460 in Selangor, and 13 in Terengganu. There were 291 returns (21.4% response rate). Specifically, of the

291 questionnaires returned, 186 of them were completed via mail, and the rest were 105 questionnaires via the Internet. A clearer picture is displayed in Table 5.10.

Table 5.10 Survey Response via Internet and Mail

Questionnaires		Percentage
Total number distributed	1,356	100.0%
Total number returned via Internet	105	7.7%
Total number returned via Mailing	186	13.7%
Total number returned	291	21.4%
Total number of unusable questionnaires	19	1.4%
Total number of usable questionnaires/response rate	272	20.0%

As the response rate and sample representative of population are a critical issue in Internet survey, as mentioned in the above section, this study will compare its response rate to that of previous research.

5.6.10 Comparison of Response Rate with Previous Research

The response rate of this study can be compared with the previous research conducted by Internet survey, such as by Van Riel et al. (2005); Wilde et al. (2004); O'Cass & Fenech (2002); Bhattacherjee (2002); Cobanoglu et al. (2001); Lederer et al. (2000); Cook et al. (2000); Kent & Lee (1999); Basi (1999); and Weible & Wallace (1998).

The response rate of this study is 20.0 percent. This number is larger than the response rate surveyed by Van Riel et al. (2005), Wilde, Kelly and Scott (2004), Bhattacherjee (2002), Cobanoglu, Warde and Moreo (2001), Lederer, Maupin, Sena and Zhuang (2000), Cook, Heath and Thompson (2000), Kent and Lee (1999), Basi (1999). Compared to the response rate according to O'Cass and Fenech (2002), it is much smaller, but it is almost the same as Wilde, Kelly and Scott (2004).

It could be concluded that response rate of this study is representative in terms of comparison of response rate with previous study. Furthermore, representativeness of the sample in terms of profile of respondent will be presented in Chapter Six.

Table 5.11 shows the response rate comparison to previous research via the Internet.

Table 5.11 Response Rate Comparison

The Previous Research Conducted by Internet	Response Rate
Van Riel et al. (2005)	8.8%
Wilde, Kelly and Scott (2004)	18.2%
O'Cass and Fenech (2002)	39%
Bhattacherjee (2002)	12%
Cobanoglu, Warde and Moreo (2001)	6%
Lederer, Maupin, Sena and Zhuang (2000)	5%
Cook, Heath and Thompson (2000)	.0013%
Kent and Lee (1999)	3%
Basi (1999)	1%
Weible and Wallace (1998)	29.8%

The following part will explain, specifically, the analysis technique employed in this study.

PART II:

AN OVERVIEW OF THE ANALYSIS TECHNIQUE TO TEST HYPOTHESES

5.7 USING STRUCTURAL EQUATION MODELING (SEM) FOR TESTING HYPOTHESES

In the previous chapter, the research hypotheses were developed. This chapter provides an explanation of how to test them and the techniques applied will be described in the following subsection as follows:

- This study proposes to apply First Order Construct in confirmatory factor analysis (CFA) to test the research proposition.
- This study employed the technique of structural equation modeling (SEM) to test the hypotheses (H1-H16).

In order to test the hypotheses, exploratory factor analysis (EFA) and structural equation modeling (SEM) were performed. Exploratory factor analysis (EFA) is employed to explore the dimensions of each construct. Based on the result of exploratory factor analysis, data then followed up by confirmatory factor analysis. This confirmatory factor analysis was used to confirm the measurement model with the same data.

Consistent with the suggestion of Da Silva and Alwi (2008, p. 1048), *'the exploratory factor analysis (EFA) should be employed then followed up with confirmatory factor analysis (CFA) in the structural equation modeling for further tests on reliability and validity'.* After exploring the data analysis, structural equation modeling (SEM) was employed to test the theoretical model, which is based on a goodness-of-fit measure rather than statistical calculation (Hair et al. 2006).

Therefore, this study employed exploratory factor analysis and confirmatory factor analysis in order to test research issues relating to what constructs are representative for industrial buyers' responses contexts. The relationship between product quality, service quality, price perception and the ethical brand and the effect of them on company reputation and brand loyalty were then tested in a two-step approach of structural equation modeling. In detail, the following sub-sections will discuss these techniques.

5.7.1 Factor Analysis

Exploratory factor analysis (EFA) was applied to the data of the main survey in order to conduct a preliminary test of the validity and reliability of the instrument. This analysis refers to correlation between variables and factors called by loading factors. According to Hair et al., (1998), the minimum value of factor loading depends on the amount of respondents. Hair et al., (1998) suggest that it needs a sample of at least 100 and if possible above 200 (Coakes & Steed, 2003). However, having 272 respondents, it is appropriate for this study to use .4 as a minimum value of factor loading (Hair et al., 1998)

In terms of technique, According to Tabachnick and Fidell (2001), exploratory factor analysis consists of principal factor analysis (PFA), also known as principal axis factoring or common factor analysis, and principal component analysis (PCA).

5.7.1.1 Principal Factor Analysis versus Principal Component Analysis

Most researchers when analyzing factors usually use the principal components analysis (PCA). According to Hair, et al. (1998) this approach is used frequently and is relevant when the study is conducted for predicting, or when it is necessary to minimize the amount of factors. However, when the objective of the analysis is to determine an essential structure, Tabachnick and Fidell (2001) suggest selecting principal factor analysis (PFA). Additionally, when a researcher wants to conduct the structural equation modeling technique after exploratory factor analysis (EFA), the analysis should be followed-up by structural equation modeling/confirmatory factor analysis, and principal factor analysis is preferred as suggested by Garson (2005) as Principal Factor Analysis tolerates adding variables into a model without disturbing the factor loading of the basic variables.

5.7.1.2 Orthogonal Versus Oblique Rotation

There is another important issue before proceeding to view exploratory factor analysis, namely, the choice of rotation. Selecting which type of rotation should be employed is the issue when a researcher wants to conduct exploratory factor analysis. The rotation technique consists of orthogonal and oblique. The orthogonal with varimax method assumes that factors are uncorrelated and independent of each other when being rotated. In other words, all factors remain independent or uncorrelated before conducting rotation. While oblique rotation by choosing direct oblimin in SPSS allows all factors to be correlated with each other. Which of these methods should be employed depends on a good theoretical reason to support it (Field, 2000). However, Schmelkin (1991) suggests using both methods and then explaining each correlation between the extracted factors. On the other hand, according to Hair et al. (2006) the oblique rotation (e.g. oblimin) more accurately reflects the underlying structure of the data than that provided by an orthogonal solution such as varimax. Therefore, the orthogonal rotated solution should be unnecessary.

For further analysis, confirmatory factor analysis (CFA) and structural equation modeling (SEM) are used for hypothesis testing. The explanation of confirmatory factor analysis and structural equation modeling will be viewed in the following section.

5.8 Confirmatory Factor Analysis (CFA) and Structural Equation Modeling (SEM)

The next step is the use of confirmation factor analysis (CFA) to confirm the measurement model. Structural equation modeling (SEM) is employed to test the

theoretical model based on a goodness-of-fit measure rather than statistical calculation (Hair et al. 2006). There are three types of measurement when using the structural equation modeling: absolute fit, incremental fit and parsimonious fit.

5.8.1 Absolute Fit

The absolute fit measurement is 'the degree to which the overall model (structural and measurement model) predicts the observed covariance or correlation matrix' (Hair et al. 2006). Chi-square, Goodness-of-fit index (GFI) and Root Mean Square Error of Approximation (RMSEA) are commonly used by many researchers for analyzing absolute fit. These indices are summarized in Table 5.12.

Table 5.12 Absolute Fit Indices

Symbol	Name	Comments	Acceptable Level
X^2	Chi-Square	Greatly affected by sample size Sample size>200 increases the opportunity to find significant differences for equal models. Sample size<100 increases the opportunity to accept the model even though relationship of the model are not significant	p>0.05 significance, p= more than 0.2 before non-significance is confirmed
GFI	Goodness-of-fit index	Higher level indicates better fit, no absolute threshold levels for acceptability.	0= poor fit 1= perfect fit
RMSEA	Root mean Square Error of Approximation	Used to correct the impact of sample size on X^2 RMSEA between 0.05 and 0.08 still indicate satisfactory fit. RMSEA between 0.09 and 0.095 still indicate considerate satisfactory fit. Value over 0.1 indicate poor-fit	Between 0.05 and 0.08

Source: Adapted from Hair et al. (2006)

5.8.2 Incremental Fit

Incremental fit is referred to as the null model when it is used for measuring a single construct model. Tucker-Lewis Index (TLI) and Comparative Fit Index (CFI) are the indicators usually used by many researchers as summarized in Table 5.13.

Table 5.13 Incremental Fit Indices

Symbol	Name	Comments	Acceptable Level
TLI	Tucker-Lewis Index	Value greater than 1 indicates poor fit Can be used for comparing alternative models	0.9
CFI	Comparative Fit Index	Value between 0.9 and 0.95 indicates satisfactory fit. Value greater than 1 indicates over fit.	0= poor fit 1= perfect fit

Source: Adapted from Hair et al. (2006)

5.8.3 Parsimonious Fit

The last fit, known as the parsimonious fit, has been defined as, *'... measurements (which) relate the goodness-of-fit of the model to the number of estimated coefficients required to achieve this level of fit and their basic objective is to diagnose whether model fit has been achieved by over fitting the data with too many coefficients' (Hair et al. 2006, p. 686-687).* This fit measure includes Parsimonious Normed Fit Index (PNFI), Parsimonious Goodness-of-Fit Index (PGFI), Normed Chi-Square and Akaike Information Criterion (AIC). However, there are few researchers who consider conducting these analyses; therefore, the current study does not conduct this Parsimonious Fit in analyzing the data.

5.8.4 Confirmatory Factor Analysis (CFA): The Measurement Model

According to Anderson and Gerbing (1988), the measurement model embraces in first and second order in confirmatory factor analysis dealing with convergent and discriminant validity. According to Cheng (2001) there are two different ways employed by researchers in the measurement model to analyze convergent and discriminant validity. The first way is for each construct to be separately tested and the second way is for all constructs to be tested at one time. For this technique the discriminant validity of the measurement is assumed but not statistically tested. Thus,

this study combined all three antecedents (product quality, service quality, and price perception) to be examined, and then the construct ethical brand, company reputation and brand loyalty were evaluated at the same time in what is proposed as "The Step-One Approach", (Anderson & Gerbing, 1998). Byrman (2001, p. 93) suggests that *'this approach is utilized to detect whether the measurement models are in fact validated and reflected in the overall acceptable model fit indexes, statistically significant parameter estimates at each indicator/item, and lack of any substantial evidence of model misfit'*.

5.8.5 Sample Size in Structural Equation Modeling (SEM)

According to Anderson and Gerbing (1988) in order for the model to converge properly, a large sample size, for example, 400 to 500 is sufficient. This amount will help to avoid inadmissible solutions due to negative variance when a construct contains two parameters whereas it happens in a small sample size of less than 150. However, ideally, according to general guidelines, a sample size of 150 to 200 is recommended. Specifically, according to Hair el al. (1998) a minimum sample size can be calculated based upon at least five respondents for each estimate parameter. In other words, the more items or estimated parameters in the model, the larger the sample size required. This technique is usually conducted when researchers need to decide whether there is a sufficient sample size to analyze the data.

5.8.6 Feasible and Statistical Significance of All Parameter Estimates to Ensure Convergent Validity is Achieved

Gathering data for a study often needs a lot of money and time, but sometimes the data is not useful because the scaling does not have high validity. Therefore, to identify whether the scale that is prepared to gather the data is correct to measure what the

researcher wants to measure, it must be carried out by testing the validity. Validity testing is needed to confirm whether the scale used in the questionnaire from the research that could be methodically responsible or not. In other words, the questionnaire can be said to be valid if the questions that are used can measure what the researcher wants to measure in every construct. Convergent validity occurs if the scale of measurement that is used has high correlation with the other scale used to measure the same thing (Vogt, 1993). The testing of convergent validity is carried out internally by means of single-item scales.

To avoid bias, Cohen et al. (1993) recommend asking the respondent's perception if they are faced with a similar situation. According to this technique, which has been applied in some previous studies, it indicates that respondents consistently express their opinions as exist in the fact. This can be proven based on the result of the t-test where P < .0001 to .0005 on 5 of 6 scenarios. Based on Cohen's et al. (1993) study, discriminant validity is conducted to measure the respondent's opinion about social responsibility orientation. In line with the current study the construct 'ethical brand' is measured by questioning respondents about the social, economic, and environmental responsibilities of branding.

Based on the above explanation, two criteria must be achieved in this study. The first is that the standardized factor loading should be 0.5 and above, which reflects a reasonably high factor loading (Kline, 1998). This condition also achieves the requirement for convergent validity of parameters. The second is that all parameters must be significant with greater than $p<.05$ or the Critical Ratio value should be below than 1.96. This means that when factor loadings are significant ($p<.05$) and standardized loadings are .5 and above, according to Kline (1998) all items achieve convergent validity.

5.8.7 Model Misfit-Specification (Lack of Any Substantial Evidence of Model Misfit)

Model misspecification is the condition in which the extent of specification error affects the proposed model. Cheng (2001) suggests that to identify whether the model misfits or not, large standardised residuals (SR) and modification indexes (MI) are utilized. According to Steenkamp and Van Trijp (1991), the standardized residual signifies the differences between the observed covariance or correlation matrix. For this purpose, if a value is greater than 2.58, it should be of concern. It means that large residuals reflected by a sub-set of items utilized to measure the same latent variable indicate that the sub-set items are likely to represent their own unidimensional factors (Steenkamp & Van Trijp, 1991). An item with the wrong factor can be detected when it cuts off large positive standardized residuals with other items from its own (correct) factors. Thus, those items with cross-loadings or corresponding to more than one factor will demonstrate big residuals with different items from different factors. Therefore, this item should be deleted from the model. Moreover, a large standardized residual with no clear pattern should be omitted as it may characterize bad items as mentioned by Garver and Merttzer (1999). As a consequence, this item generally represents the bad item and should be removed from further analysis. Thus, when the modification is conducted, the model should then be re-specified and re-evaluated after each of the modifications (or deletion of items) as suggested by Steenkamp and Van Trijp (1991). As a guideline, Hair et al. 1998) suggest that the acceptable range for the large standardized residual in a model is when it is greater than 2.58 or 5% of the residuals.

On the other hand, the *Modification Index (MI)* is another alternative to identify misfits in a model. Joreskog and Sorbom (1989) suggest that the indexes are useful indicators in evaluating measurement model fit. The values of MI are matched with

the reduction in Chi-Square and the coefficient is estimated. For instance, some MI indicates the cross loading is in more than one factor. The largest MI indicates the greatest progress in fit and these items should be evaluated for revision. It is like the SR, the model under evaluation should be re-assessed after each re-specification via MI.

Thus, these standardised residuals and modification indices facilitate the researcher to determine the cause of misfit in a particular model and offer suggestions on how to modify the model to be fit. This is in line with Anderson and Gerbing (1988) that when poor fit occurs, items can be related or added to a different factor or deleted from the model. It is necessary to note that according to Joreskog (1993) and Byrne (2001) any modification (which refers to any deletion or addition of the item to another construct) must be theory driven, statistical and practical considerations as justified by Byrne (2001).

5.8.8 Achieve the Required Level of Internal Reliability

The reliability test is a statistical tool to test the rate of consistency and the stabilization of the instrument. Most researchers use Cronbach's Alpha to measure the internal consistency of the instrument in terms of reliability. According to Gable's (1986) argument, coefficients of Cronbach's alpha 0.80 or above should be considered good, and Cortina (1993) suggests that alpha coefficients of 0.85 or above are quite good. However, according to Nunnally's (1967) argument, alpha values that are 0.5 and above can be accepted as having adequate reliability.

Two reliability analyses are recommended if the study employs structural equation modeling (SEM). These consist of (1) Cronbach's alpha (CA); and (2) Composite reliability (CR). Cronbach's alpha (CA) is the universal method conducted by most

researchers in the past to evaluate internal consistency of a scale. While, according to Hair et al. (2006) and in line with Carver and Mentzer (1999) Composite reliability (CR) is computed manually by viewing the portion of AMOS output, which offers Standardized Loadings and Squared Multiple Correlation (R2). As Hair et al. (2006, p.777) explained, '*it is easily computed from the squared sum of factor loadings (λ_i) for each construct and the sum of the error variance terms for a construct (δ_i)*' as:

$$\text{Construct Reliability (CR)} = \frac{[(\text{SUM}\ (\lambda_i))^2]}{[(\text{SUM}\ (\lambda_i))^2 + \text{SUM}\ (\delta_i)]}$$

Whereas:

- Let λ_i represents the standardized loadings for the items for a particular latent variable;

- Let δ_i represents the corresponding error terms, where error is $I - R^2$ of the items.

Note: R^2 is the squared multiple correlation, also known as indicator or item reliability in structural equation modeling (SEM).

The rule of the acceptable level of this reliability estimated is that .7 or higher, as suggested by Hair et al. (2006), is a good reliability condition. However, between .6 and .7 of reliability may be the minimum level (the acceptable level) for measures used in research (Hatcher, 1994). Additionally, internal consistency will exist when high construct reliability has been indicated. It means that the measures represent the same construct consistently (Hair et al., 2006).

These Cronbach's Alpha (CA) and Construct Reliability (CR) were demonstrated in the present study not only to indicate the internal consistency level between the two results (particularly for Cronbach's Alpha (CA) and Construct Reliability (CR), but

also because according to Carver and Mertzer (1999) previous research demonstrated both reliabilities analysis (i.e. Cronbach's Alpha and Construct Reliability) if structural equation modeling (SEM) is employed for data analysis.

5.8.9 Model Assessment in Two Step-Approach

The assessment in this step-two concerns the level of predictive validity. Predictive validity in this step involves two tests: (1) to test the overall model fit with the structural model; and (2) to test whether the structural parameter estimates identifying the relationships among constructs or variables of the independent-dependent exist in the structural model. In other words, in line with Byrne (2001), whether or not the construct of interest (independent variables) predicts the constructs that it is supposed to predict (dependent variable), will assist the researcher to conclude whether or not the observed or proposed model confirms the hypothesized model and whether it adequately describes the sample data.

5.8.10 Univariate and Multivariate Normality in Structural Equation Modeling (SEM)

When exploratory factor analysis or confirmatory factor analysis is employed in analysis, data is suggested to be analyzed based on a univariate and multivariate normal distribution (Hair et al., 1998; and Tabachnick & Fidell, 2001). In terms of normality, it is one of the assumptions that must be required by data when it will be run using multivariate analysis. If univariate normality is achieved, multivariate normality will occur too.

According to Tabachnick and Fidell (2001), univariate normality (each variable/item) can be assessed by Skewness and Kurtosis. In terms of Skewness, as Kline (1998) proposed the considered level of the value should be greater than 3.

While, the considered level of kurtosis, according to Kline (1998), of greater than 10 may suggest a variable departed from normality and a value exceeding 20 indicates an extreme level of kurtosis, thus presenting a more serious departure from normality. For this purpose, AMOS 5 is used to assess the univariate normality in structural equation modeling, in which it produces a portion of output known as Mardia's coefficient (Mardia, 1970).

Another step in examining the data is multivariate normality. Multivariate normality is an important assumption according to Hair et al. (2006), particularly for structural equation modeling (Byrne, 2001). This analysis involves identifying the missing data analysis and outlier detection (Hair et al. 2006).

The issues include: (1) The practicality of combining a few distributions in order to check for multivariate normality assumption and (2) lack of guidelines available so far to assess the multivariate normality in structural equation modeling. For this purpose, this study employs the regression analysis via normality plot for independent and dependent variables to address the first issue. Because of the lack of guidelines available and based on the previous literature, the Maximum Likelihood Method (ML) is conducted. This can handle a moderate departure of normality (Jaccard & Wan, 1996). Moreover, according to West et al. (1995), even Comparative-Fit Index (CFI) can be an indication based upon its index affected by departure of normality.

5.9 CONCLUSION

This study has carried out a quantitative approach using mail and e-mail surveys via the Internet as the methodological basis of the study. Pre-testing and a pilot study were conducted to gather the basic information on wording, order and forming of

questions to confirm that the questionnaire is comprehensible. Even though a low response rate was achieved through using the survey method, when compared to previous studies using the same method, the response rate can be considered acceptable.

Respondents have sufficient experience with the buying decision of electronic office equipment and, therefore, have met the criteria as explained. In terms of data analysis, this study employed the structural equation modeling for testing propositions and hypotheses. For the first step, exploratory factor analysis was employed followed by confirmatory factor analysis for the measurement model. Some assumptions (e.g. testing the validity, reliability, and identifying univariate and multivariate normality) were also addressed to confirm the data fit before proceeding to structural equation modeling for analyzing the hypotheses testing.

A comprehensive analysis of the data is provided in the next chapter.