PERCEIVED RISK FACTORS BY PERSONAL COMPUTER USERS IN THE PRE – PURCHASE PHASE: A CASE OF USERS IN DIFFERENT INCOME GROUPS IN NAKURU MUNICIPALITY, KENYA.

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A RESEARCH PROJECT SUBMITTED IN PARTIAL FULFILMENT FOR THE AWARD OF MASTER OF BUSINESS ADMINISTRATION DEGREE IN THE FACULTY OF COMMERCE OF EGERTON UNIVERSITY

EGERTON UNIVERSITY

AUGUST 2005

DECLARATION

This research project report is my original work and has not been presented to any institution of learning.
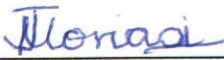
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ABSTRACT

Personal computer ownership is still low despite significant progress made in personal computer development and sensitization on the benefits derived from computer usage. Previous work on risk management has established several inhibiting factors and has developed several risk reduction strategies. However, personal computer buying still remains a risky undertaking where decisions must be made notwithstanding the complexity of the product. This study investigated the perceived risks of personal computer buying and posited that perceived risk factors significantly differ among the income groups and that overall perceived risk levels among the income groups are significantly different in the pre – purchase phase of personal computers. Purposive sampling was used to select sixty respondents who were then grouped along income groups. The study used a questionnaire to collect primary data. In analyzing the collected data descriptive statistics was used to carry out preliminary investigations. An empirical investigation revealed that there was a significant difference in the overall perceived risk levels among the various income groups and that of the risk factors under study, only financial and physical risk factors showed significant difference among the various income groups. Time, functional, psychological, and social risk factors were perceived to be the same among the various income groups. There is need therefore to use financial and physical risk factors as a basis for designing a marketing mix unique to each income group. The results offer insights to

marketers and marketing researchers about the role of pre-purchase information in risk management.

ACKNOWLEDGEMENT

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ABBREVIATIONS AND ACRONYMS

CD – Compact Disk

CPU – Central Processing Unit

ELF – Extremely Low Frequency

EMF – Electromotive Force

Gb – Gigabytes

IT – Information Technology

Mb – Megabytes

Ms – Milliseconds

PC – Personal Computer

ROM – Read Only Memory

SRT – System Response Time

VDT – Visual Display Terminal

VLF – Very Low Frequency

ICT – Information and Communications Technologies

KEBS – Kenya Bureau of Standards

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CHAPTER ONE: INTRODUCTION

1.0   Background Information

Computers have revolutionized society. Today they are part and parcel of our every day lives. The technology has penetrated all sectors, including banking, agriculture, mining, transportation, research, defense, medical services, accounting and communications. Computer usage is on the rise as jobs which were previously manual, routine in nature, repetitive, dangerous and demanding are now getting automated taking advantage of computerization.

Even though many people are using computers and that their usage is increasing, Africa still lags behind in as far as computer usage is concerned. Africa's computer market is hampered by among other factors lack of computer skills and training among the population, the absence of clear strategic buying plans, and the need for more foreign currency to purchase computers.

However, most African governments and private organizations are beginning to address this very serious problem by putting in place policies that will ensure that as many people as possible acquire and know how to use computers. In Kenya, the government has encouraged the establishment of computer degree courses at local universities and already has in place a curriculum which incorporates computer studies to be taught in secondary schools. In 1998 the Minister for Finance in his Budget proposals reduced the import duty on computers and computer equipment from 25% to 5%. In the following

year the rate was also made applicable to computer software. In the fiscal year 2003 – 2004 the Kenya government zero rated tax on computers and its associated products. All this was meant to make it possible to as many people as possible to have access to personal computers. The government has liberalized its Information and Communications Technologies (ICT) market in order to encourage competition and therefore ensure quality products at competitive prices.

Manufacturers too have made advancements in the manufacture of personal computers by focusing on improving speed, performance and efficiency. The performance of computer hardware continues to improve at a rapid rate while costs reduce to maintain very attractive price/performance ratios. Memory and storage technologies have been evolving at almost the same rate as Central Processing Unit (CPU) technology. The hard disk technology, physical size, access times and costs continue to reduce while storage capacity is rising rapidly.

There is relatively low level of computer access and computer ownership is still low. In the year 2000 for instance, there were approximately 150,000 personal computers or 1 per 2000 Kenyans. (Computer Society of Kenya, 2003).

When consumers are presented with a new product, a number of factors determine their decision to purchase. Their fears range from successful adoption of the new technology

to the unforseen hazards of embracing the new product. The way they perceive products affects their buying decision which may not be entirely based on objective factors but subjective considerations as well.

It is against this background that it is important to study and understand the behaviour of consumers in this industry. Towett (2002) states that choice is the key issue in consumer behaviour and the outcome of this choice can only be known in future. Since the outcome can only be known in future, consumers therefore take risks in the purchase decisions because they have to deal with uncertainties about the future. Therefore, understanding consumer risk perceptions in the computer industry will aid in focusing product development and marketing efforts. Only manufacturers and suppliers offering total solutions, advising buyers on hardware, software and staffing requirements, installing and maintaining equipment and training are expected to survive in this fierce competitive industry. Manufacturers and suppliers who understand their customers are bound to be sensitive to their fears and therefore develop better products, promote their products and services more effectively and develop strategies that foster sustainable competitive advantage.

1.2   Problem Statement

The contributing factor to low ownership of personal computers could be as a result of perceived risks associated with them. There are various risks that may be perceived by consumers who would like to own personal computers that could discourage them from

purchasing personal computers. They include financial, functional, physical, time, psychological or social risk or a combination of risks. The risks predominant in the pre – purchase phase of personal computers have not been determined. The researcher would therefore like to determine the risks that are predominant among personal computer users in the pre – purchase phase.

1.3   The Research Objectives

The main objective of the study was to investigate the perceived risk factors among the lower, middle and upper income groups in the pre – purchase phase of personal computers in Nakuru municipality.

Specific objectives were to:

(i) Identify the most significant perceived risk factors among the various income groups during the pre – purchase phase of personal computers;

(ii) Determine whether there is a significant difference in the overall perceived risk levels among the income groups in the pre – purchase phase of personal computers.

1.4   Hypotheses

(i) Perceived risk factors do not significantly differ among the income groups in the pre – purchase phase of personal computers.

(ii) Overall perceived risk levels among the income groups in the pre – purchase phase of personal computers are not significantly different.

1.5   Significance and Justification of the Study

The results of the study will contribute a pool of knowledge in the area of perceived risk which could be useful to scholars in this area. Identifying and documenting consumer perceived risks would help marketers in focusing on product development, directing marketing efforts, meeting customer expectations and eventually hasten embracing of information technology. Consumer buying behaviour is critical to investors in the computing industry. By understanding the perceived risks of the customer the firms will endeavour to minimize them and therefore retain the customer confidence in them. The study will inform new entrants into the market and the already existing investors of the type of clientele to expect. Firms therefore will be able to develop better products tailor made to addressing consumers perceived risks with a view of minimizing these risks. This can help firms to know which areas to emphasize during promotions and therefore have a competitive edge over competitors.

The results of the study will assist a number of stakeholders in the computer industry, for example the results will be of help to the Kenya Bureau of Standards (KEBS) in enforcing high quality products. This is because KEBS would have knowledge of the risk facets that are important to consumers.

New and existing consumers too will benefit as the study will sensitize them on the key issues affecting personal computer users and therefore be on the look out to ascertain whether firms have addressed these fears.

The study was justified in that most consumers purchasing computers are first time buyers and computerization is still at infancy in Kenya, marketers are therefore faced with the task of influencing consumers to buy computers, inform them of the basic nature and functions of their new services. Marketers should therefore persuade consumers that the benefits of purchasing a computer outweigh the perceived risks. This will help boost their sales.

1.6   Scope and Limitation of the Study

The study confined itself to personal computer users in Nakuru municipality. Nakuru municipality was selected due to its accessibility. Most respondents were concentrated around Nakuru municipality which made it cheaper and convenient. Given its cosmopolitan population, the presence of learning institutions such as the universities and a host of middle level colleges, was able to provide the target population of computer users. Personal computer users in the lower, middle and upper income groups were the target group. The perceived risk factors under investigation included functional risk, physical risk, financial risk, social risk, psychological risk and time risk. There was difficulty in the administration of the questionnaires as most respondents were busy people and could not be reached easily. There were cases where I had to reissue the

questionnaires as the ones issued earlier had been misplaced. The results cannot be generalized for all personal computer users but can only be relevant to personal computer users in Nakuru municipality. This is because of the diverse nature of the respondents.

1.7   Definition of Terms

Consumer Behaviour: Is the study of the processes involved when individuals or groups select, purchase, use, or dispose of products, services, ideas, or experiences to satisfy needs and desires.

Perceived Risk: Is the uncertainty that consumers face when they cannot foresee the consequences of their purchase decisions.

Perception: Is the process by which an individual selects, organizes and interprets stimuli into a meaningful and coherent picture of the world.

Personal Computer: A computer used by one person for private work.

Pre-purchase information: Is a series of data processed according to consumer-specific purposes.

CHAPTER TWO: LITERATURE REVIEW

2.0   Consumer Behaviour

A buying process starts with recognition of some kind of a problem, which leads to a search for ways of solving the problem. Possible solutions to the problem are then compared and evaluated, leading to a decision to buy one of them, resulting in some kind of output. Consumers are highly involved with some purchases and less involved with others. The major determinants of the degree of involvement are functional, financial, perceived risk, emotional value and social significance. The degree of involvement has a major impact especially on the search and evaluation of alternatives phases of the buying process. (Blois, 2000)

Consumers collect and evaluate information through consumer reports, magazine advertising, brand name, word-of-mouth communication, and customized information. Where risk is high, the value of external search is also high, as several types of risk can be minimized through time and effort spent in the search for information. The search activity is entered into with the intent of lowering the person's overall perceived risk level. Optimal information about products reduces perceived risk and uncertainty and, ultimately, exerts a positive effect on product purchase intentions. (Hong – Youl, 2003)

2.0.1   Information Search

Before making purchase decisions, consumers engage in some kind of pre – purchase information search. Consumers have special characteristics that recognize optimal

information from resources and consumers act depending on their own given situation. In particular, the ability to collect product information and make comparisons between the different product offerings from different providers—possibly across national and currency boundaries—is often viewed as one of the main competitive challenges (Hong – Youl, 2003).

Information search can be internal or external, or both. Internal searches involve no sources other than the consumer's own memory, knowledge and experience. Memory is the key component of internal search. The frequently subconscious response upon encountering a problem that may be solved in the market place is to scan the information stored in memory for potential solutions. Those who have prior knowledge and experience (experts) are more likely to find answers through internal search than those who are novices. (Berkman, et al, 1996)

In external search, the consumer looks beyond his or her memory for new information that will aid in making the purchase decision. Information can come from personal sources such as friends, experts, or salespeople or from impersonal sources such as advertising, in-store displays or trade reports. External search is typical for purchases the consumer considers important. Information can be gathered from an almost unlimited variety of sources outside the individual. The consumer may be unsure of the ability of a product or brand to meet certain needs or solve certain problems, thus necessitating external search for supporting information. If a consumer feels able to

accurately evaluate information about products and product attributes, external search will most likely occur. If he or she does not feel competent to do so, he or she will most likely minimize external search. An important step for marketers in accessing the consumer's level of confidence in the potential of the product to meet current needs and in his or her ability to judge among brands is to determine whether the target market is made up of expert or novices consumers or both. Where risk is high, the value of external search is also high, as several types of risk can be minimized through time and effort spent in the search for information. Marketers must therefore be aware of the perceived risks that consumers attach to their products and services. (Berkman, et al 1996)

The nature of the search activities undertaken (and thus the amount of search) is a function of the person's acceptable risk level, the levels of the two components of perceived risk, the costs and benefits of the specific available risk-reduction activities, and the ability of the person to suffer a loss. Consumers own experience with a product, recommendations from family, friends, and colleagues and previous imprinting as a result of promotion are important resources that influence consumer perceived risk. Optimal information about products reduces perceived risk and uncertainty and, ultimately, exerts a positive effect on product purchase intentions. Accordingly, a large number of consumers participate in positive pre-purchase information collection processing in order to reduce the risk. Furthermore, pre-purchase information

acquisition may alert consumers to risks and pitfalls within the product choice of which previously they had been unaware. (Hong – Youl, 2003),

Recent research has indicated the presence of two general types of uncertainty: knowledge uncertainty (uncertainty regarding information about alternatives) and choice uncertainty (uncertainty about which alternative to choose). Choice uncertainty appears to increase the search, while knowledge uncertainty has a weaker, negative effect. Pre-purchase risk reduction essentially focuses on increasing the amount of certainty that a satisfactory product will be purchased as well as reducing the negative consequences (Hong – Youl, 2003).

In figure 1 below, the purchase is viewed as a process that goes through several steps: problem recognition, search, evaluation of alternatives, purchase and outcome. A buying process starts with recognition of some kind of a problem. This may come from an internal stimulus such as hunger, fatigue, or desire to impress a date, or it may come from external stimuli such as an invitation to a wedding or a radio advert. This then leads to a search for ways of solving the problem. Possible solutions to the problem are then compared and evaluated, leading to a decision to buy one of them, resulting in some kind of output. In one way or another, all buying decisions can be analyzed using these steps. The model shows that psychological variables and social influences all affect a persons buying behaviour. (McCarthy, et al., 1993)

Figure 1 : A model of buyer behaviour
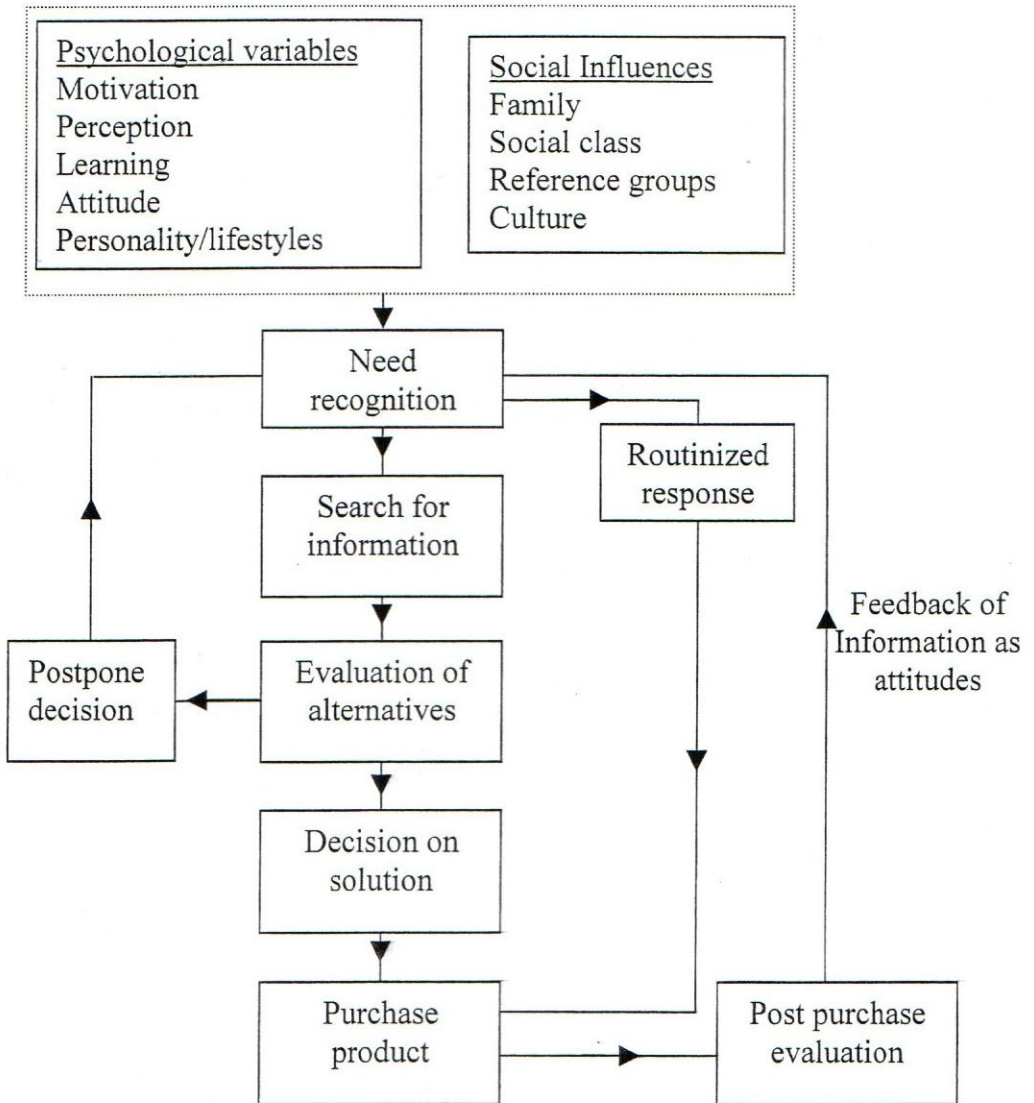
Source: (McCarthy, et al.,1993)

2.0.2   Perception

Individuals perceive two stimuli in totally different ways based on their needs, values,

personality, expectations and experience. Perceptual processes involve additions and/or

subtractions to raw sensory inputs to produce our own private picture of the world. It

consists of two different kinds of inputs: physical stimuli from the outside environment and internal (or personal experiences) in the form of certain predispositions (e.g motives, expectations and learning) based on previous experience. Thus individual's perceptions are unique because each individual is unique.

It is not enough to make an excellent product. Rather for customers to be satisfied or delighted, they must perceive that the product is excellent. Consumers are exposed to an enormous array of marketing information when shopping, traveling and even from magazines which contain advertisements and articles about categories and brands of products. Among all the messages they are exposed to consumers pay attention to only some. Such selective attention occurs so that they don't feel bombarded by too much information. Consumers also tend to hear and interpret things in a way that fits existing beliefs and values. For example, someone who believes computers are difficult to use will tend to remember all the stories he or she hears about system crashes. Consumers too have a tendency to remember only certain information, typically that which matches existing beliefs and values (Churchill et al. 1994).

Consumers' perception of risk are important determinants of consumer behaviour. Individuals act and react on the basis of their perceptions, not on the basis of the objective reality. Thus, to the marketer, consumer's perceptions are much more important than their knowledge of the objective reality. And because individuals make decisions and take actions based on what they perceive to be reality, it is important that

marketers understand the whole notion of perception and its related concepts, so they can determine what factors influence consumers to buy. (Zaltman, et al, 1983, and Schiffman, et al, 1999)

2.0.3 Perceived Risk

Consumers must constantly make decisions regarding what products or services to buy and where to buy them. Because the outcomes (or consequences) of such decisions are often uncertain, the consumer perceives some degree of risk in making a purchase decision. The degree of risk that consumers perceive and their own tolerance for risk taking are factors that influence their purchase strategies. It should be stressed that consumers are influenced by risks that they perceive, whether or not such risks actually exist. Risk that is not perceived no matter how real or how dangerous it is will not influence consumer behaviour. Risk comes in many forms. It may be present if the product is expensive or is complex and hard to understand. Perceived risk can be a factor even if a product choice is simply visible to others and consumers run the risk of social embarrassment if the wrong choice is made. Consumers' perception of risk varies depending on the person, experience, the product, the situation and the culture. An individual's perception of risk varies with product categories. For example, consumers are likely to perceive a higher degree of risk (e.g. functional risk, financial risk, time risk) in the purchase of a high – definition television set than in the purchase of an automobile. (Solomon,1991and, Schiffman, et al 1999).

The degree of perceived risk is a function of the amount at stake of not gaining what a person is trying to gain, having a person pay a penalty for trying to make the gain, or losing the means by which a person hopes to make the gain, and the individual's subjective feelings of certainty that the consequences will be unfavorable. "Uncertainty" is related to the identification of buying goals or the process of matching goals with the purchase decision. "Consequences" may relate to functional, performance, or psychological goals and the money, time, and effort invested to achieve those goals. (Mathews, 2004)

2.0.4 Types of Perceived Risks

The extent that a consumer cannot always be certain that all of his or her buying goals will be achieved, risk is perceived to be a factor in most purchase decisions. In fact, much of the work on risk taking indicates the perceived risk is little more than unresolved tension due to opposing vectors or forces. Risk emerges from any of the following factors; Uncertainty as to buying goals, which of several purchases (product, brand, model, etc.) best matches the buying goals and possible adverse consequences if the purchase is made (or not made). (Hong – Youl, 2003)

The concept of perceived risk often used by consumer researchers defines risk in terms of the consumer's perceptions of the uncertainty and adverse consequences of buying a product. Consumers are credited with the capacity to receive and handle considerable quantities of information and undertake extensive pre-purchase searches and

evaluations. This study in particular, investigated the perceived risks pre-purchase information on: performance risk, financial risk, psychological risk, and time risk associated directly with perceived computer usefulness. (Hong – Youl, 2003).

Every purchase decision involves some level of risk. There are several types of risk that can discourage consumers from purchasing or that can delay the purchase decision. Tthe major types of risks that consumers perceive when making product decisions include functional risk, physical risk, financial risk, social risk, psychological risk and time risk. (Berkman, et al, 1996, and Schiffman, et al, 1999)

Several types of perceived risk, including financial risk, performance risk, physical risk, social risk, and psychological risk, have been widely applied in previous research (e.g., Younghwa et al. 2003; Hong – Youl 2003; Hanjun, et al. 2004). Financial risk can be viewed as the likelihood consumers feel about their potential monetary loss from choosing a particular product or brand. This is net financial loss to a customer, including the possibility that the product may need to be repaired, replaced or the purchase price refunded. It is the risk that the product will not be worth its cost. This is an extension into the future of the perceived price paid at the point of purchase. Where the loss of money is an important consideration, financial risk is said to be high. Performance/functional risk is related to the likelihood that a product will actually function as expected. Performance risk occurs when the product chosen might not perform as desired and thus not deliver the benefits promised. This integrates the future

quality of the product to the point of purchase. Physical risk is considered to be possible safety problems from using the product, especially those directly related to health and safety. It is the fear that the product may be harmful or become harmful or injurious to one's health. For example whether the computer monitor is really safe, or whether it does emit harmful radiations. Psychological risk is the probability that the selected product will be consistent with the consumer's self image. It is the risk that a poor product choice will bruise the consumer's ego. For example, thinking that you will be embarrassed if your friends saw what you bought. Social risk is the fear that the product may negatively affect the way others think of the consumer. It is actually the risk that poor product choice may result in social embarrassment. The thought of whether your say friends will laugh at your new product. Finally, time risk is the risk that the time spent in product search may be wasted if the product does not perform as expected. It results when the passage of time reduces the ability of the product to satisfy wants, such as when a product rapidly becomes obsolete. The thought of having to go through the shopping effort all over again. (Schiffman, et al 1999).

2.0.5 Previous Studies on Perceived Risk

Previous studies suggest that consumers have different risk perceptions with regard to different products. In a study on Perceived Risks and Product Information by the Product Categories at Cyber-shopping malls, consumers' behaviour at cyber-shopping malls was examined in terms of the six perceived risks: financial, functional, physical, psychological, social, and delivery interval risk. Using the six risk factors, the study

sought to determine which perceived risks had significant effects on the consumers' behaviour at cyber-shopping malls. In the study, it was confirmed that consumers would make decisions on purchases at cyber-shopping malls to reduce their perceived risks. The result of a multiple regression analysis showed that the model for the perceived risks was significant, $F(6,61)=8.97$, $p< .001$, $R\ square = .469$ and that functional, the psychological and the delivery interval risks had significant effects on the perceived usefulness and therefore were the main factors to influence consumer's behaviour at cyber – shopping malls. (Younghwa, 2003).

The study on the Effects of Consumer Risk Perception on Pre-purchase Information in Online Auctions: Brand, Word-of-Mouth, and Customized Information, examined how consumer information processing affected consumers' perception of risk prior to purchase. The results showed that customized information and word-of-mouth communication influenced consumers more than did other types of information from online auctions. Consumers relied on the two factors because they were based on consumer experience and were relevant to product purchase. Nevertheless, brand also had a significant effect upon consumer perceived risk. Pre-purchase information processing was directly related to reducing consumers' risk perception. In particular, information processing associated with product performance played a crucial role in reducing consumers' perceived risk in online transactions. (Hong – Youl, 2003)

The study on cross – cultural differences in perceived risk of online shopping investigated perceived risks influencing consumer purchase decision process during online shopping. The study specifically investigated the differences in perceived risk between online shoppers and non-online shoppers, as well as online shoppers' perceived risk relating to two culturally different countries (i.e., Korea and the United States). The results showed that the perceived risk is higher for non- (or less-experienced-) online shoppers than for frequent online shoppers, and that both Korean and US Internet users have a similar aggregated degree of perceived risk toward online shopping, though there were significant relative differences in specific risk items (i.e., social, financial, time, and psychological risk), which reflect the existence of the cultural differences in response to the specific risk factors. (Hanjun, et al. 2004)

In the study on risk perception and e – shopping: A cross – cultural study, the following examination was carried out. First, whether there were differences in risk perception between the USA and Korea, second, whether there were differences in risk perception between apparel purchasers and non-apparel purchasers across countries, third whether there were differences in the effect of risk factors on purchasing intention between the USA and Korea, and, fourth, whether there were differences in the effect of risk factors on purchasing intention between apparel purchasers and non-apparel purchasers across countries. The findings suggested that there were differences in consumers' risk perception between apparel and non-apparel purchasers across countries. In addition,

there were similarities and differences in the relationships between risk perception and purchase intention across countries. (Choi, et al. 2001)

The study on the Effect of brand name on consumers' risk perceptions in online shopping, investigated the relationship between brand names and consumers' perceived risk. Hypotheses dealt with whether the presence of a product's brand name affects consumers' perceived risk towards shopping online, whether the familiarity with a brand name influences consumers' perceived risk, and whether online shoppers and non-shoppers perceive risk towards shopping online differently. Results indicated that the presence or absence of a product's brand name affected online shoppers' perceived risk. There was no significant difference between online shoppers' perceived risk vis-à-vis brand familiarity. However, online shoppers possess lower perceived risk than do nonshoppers. (Matthews, et al. 2002)

Because a personal computer is a complex product, consumers are likely to perceive a certain level of risk when making a purchase. Even though consumers engage in information gathering to mitigate some of their perceived risk, nonetheless, they still inevitably must deal with potential hazards from technological problems, manufacturers, retailers, or hackers, as well as concerns over product choice (Matthews, et al. 2002)

2.0.6 Perceived Risk Model

Consumption behaviour was theorized to depend upon an individuals subjective perception of the risk inherent in a particular product buying propositions. Concepts of perceived risk stresses the subjective nature of perception. Different people will tend to view risk according to their personality and experience. Risk is a function of two elements, uncertainty and consequences. A consumer will weigh up carefully the risks involved in purchasing particular products and select the one that minimizes perceived risk. In general risk may be viewed by consumers as having several elements or aspects affecting their buying decisions, these are; financial, performance, physical, psychological, social and time loss. Different sets or combinations of these elements are likely to be present in specific situations, and decisions will be affected by personal assessments of the total risk involved. For example psychological risk may be perceived because a product might conceivably be inconsistent with the prospective purchasers self image, time loss may arise from fears that a purchase might not live up to its expectations, perhaps resulting in annoying waste of time in taking for instance, a home computer back to the suppliers for adjustment or replacement. (Chisnall, 1994).

Figure 2 below shows the proposed theory of risk taking in consumer behaviour to be composed of interrelated components. The uncertainty about an outcome can be reduced by acquiring information and uncertainty about the consequences can be dealt with by reducing consequences through reducing the stake or putting off the choice. (Taylor, 1974)

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Figure 2: A model of risk taking in consumer behaviour


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                              ┌──────────┐
                              │  Choice  │
                              └────┬─────┘
                                   ▼
┌──────────────┐            ┌────────────────────────────┐
│ Generalized  │            │ Uncertainty/perceived risk │
│ self esteem  │            └────────────┬───────────────┘
└──────┬───────┘                         ▼
       ▼
┌──────────────┐            ┌──────────────────┐
│ Specific self├───────────►│     Anxiety      │
│   esteem     │            └────────┬─────────┘
└──────┬───────┘                     ▼
       ▼
┌─────────────────────────────────────────────────┐
│  Development of risk reduction strategies        │
└──────────────┬──────────────────────┬────────────┘
               ▼                      ▼
     ┌──────────────────┐   ┌──────────────────────┐
     │   Uncertainty    │   │   Uncertainty about  │
     │  about outcome   │   │    consequences      │
     └────────┬─────────┘   └──────────┬───────────┘
              ▼                        ▼
     ┌──────────────────┐   ┌──────────────────────┐
     │ Functional       │   │ Functional           │
     │ Psychological    │   │ Psychological        │
     │ Financial        │   │ Financial            │
     │ Social           │   │ Social               │
     │ Physical         │   │ Physical             │
     │ Time             │   │ Time                 │
     └────────┬─────────┘   └──────────┬───────────┘
              ▼                        ▼
     ┌──────────────────┐   ┌──────────────────────┐
     │ Reduce uncertainty│  │ Reduce consequences  │
     └────────┬─────────┘   └──────────┬───────────┘
              ▼                        ▼
     ┌──────────────────┐   ┌──────────────────────┐
     │ Acquire and handle│  │ Reduce amount of     │
     │ information       │   │ stake or put off     │
     └────────┬─────────┘   └──────────┬───────────┘
              ▼                        ▼
            ┌──────────────────────────┐
            │      Decision to buy     │
            └──────────────────────────┘
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Source: (Taylor, 1974)

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2.1 Evolution of Computer Performance

The evolution of computer architecture focuses on improving speed, performance and efficiency. Advancements made in pipelining and simultaneous multithreaded of processors are all geared towards allowing the Central Processing Unit (CPU) to process multiple instructions at the same time and therefore enhancing computer performance. (Onunga, 2003). The performance of computer hardware continues to improve at a rapid rate while costs reduce to maintain very attractive price/performance ratios. This is shown in the table below which compares the CPU and display characteristics of a desktop Personal Computer (PC) in 1981, 1991, and 1995. The extrapolated profile of a desktop in early century is also included. (Simon, 1996)

Table 1 : CPU comparison and display characteristics of desktop PC 1981 – 2000

	1981	1985	1991	1995	1997	2000+
Intel CPU	8088	80286	80486	Pentium	P6	P6+
Clock frequency	4.77 MHz	25 MHz	50 MHz	120 MHz	250 MHz	300+MHz
Number of transistors	29000	100000	1.2 million	3.1 million	6-10 million	100 million
Typical real memory	128Kb	1Mb	2-4Mb	8-16Mb	32-64Mb	64-128Mb
Maximum real memory supported	256Kb	4Mb	64Mb	256Mb	2Gb	nGb
Display density	320x 200	640x 400	1024x 768	1268x 1024	1268x 1024	1268x 1024
Display colours	4	16	256(8 bits per pixel)	16.7million (24 bits per pixel)	16.7 million	16.7 million

Source: Simon (1996)

Memory and storage technologies have been evolving at almost the same rate as CPU technology. The hard disk technology, physical size, access times and costs continue to reduce while storage capacity is rising rapidly. A desktop multimedia PC now incorporates gigabytes of hard disk storage with access times of much less than 20ms and a transfer rate of much greater than 10 Mb/s. (Simon, 1996)

Optical storage devices offer greater storage capacity compared to hard disks because the amount of space needed per bit and the spacing between tracks is much smaller. The current compact disk (CD) family of WORMs (write once, read many times), CD – RW, CD – R offer high disk capacity but with slower access times and transfer rates. CDs offer cheap, portable, large capacity and durable storage. (Simon, 1996). The latest technology in optical storage is the digital versatile disk (DVD). One DVD can contain up to 17 giagabytes (Gb) of data. The large potential storage capacity makes DVDs an attractive alternative for all forms of commercial data storage, and for large software suites that would otherwise require several CDs. (Curtis et, al 2002)

2.2 Computer Electromagnetic Radiation and its Health Effects

User's health may be affected by radiation given off by your computer and that this is so because computers do generate very low levels of infrared light, visible light, ultraviolet light, X-rays and electromagnetic fields. Recent studies have raised some concerns about Extremely low frequency (ELF) and Very low frequency (VLF) waves, ultrasound, electrostatic fields and other emissions as well. Very low frequency (VLF)

electromagnetic waves are also emitted by computers. There is yet no sufficient evidence to prove any adverse effect of VLF or ELF radiations to the human body. (Charles, 2004)

Health problems associated with computer use include miscarriages, birth defects, tumors, headaches, cataracts, vision problems, fatigue, skin rashes, nausea, and sleeplessness. There is an almost fivefold increase in brain tumors among women who worked at video display terminals VDT's (computer terminals /visual display terminals). Huge proportion of miscarriages and embryonic deformities occur among pregnant women working on computers. To protect yourself from harmful radiations one needs to buy a computer radiation filter. Buy the type of glare filter that has "radiation /static protection" because it blocks out or reduces exposure to very low and ELF radiation by over 99.99% while reducing eye stain and fatigue. (Suzar, 2002)

To reduce the effect of computer radiations users should keep their distance since electromagnetic radiations follows the inverse square rule, which is to say the further away you are from the source, the weaker they get and they do so quickly. Stay at least 75 centimeters (30 inches) from your terminal and at least one meter (40 inches) from other terminals. Keep it fixed since X-ray production increases dramatically when the VDT is damaged, improperly maintained, or just plain worn out. PCBs are sometimes released by very old VDT models (i.e. built before 1970). Limit your time, if you have to sit at the computer for hours every day. (Charles, 2004)

2.3   Conceptual Framework

Consumer's perception of risk varies with the product. For example consumers are likely to perceive a higher degree of risk (e.g. functional risk, financial risk, time risk) in the purchase of a television set than in the purchase of an automobile. Consumers therefore tend not to make purchases when they perceive high risks and try as much as possible to minimize perceived risk through search activities before making any purchases. (Schiffman, et al 1999). Figure 2 shows that consumers in various income groups will perceive risks whose levels may be different or same and which affects the purchase decision.

Figure 3 : A conceptual model on perceived risk factors of personal computer users

Source: Own

CHAPTER THREE: METHODOLOGY OF RESEARCH
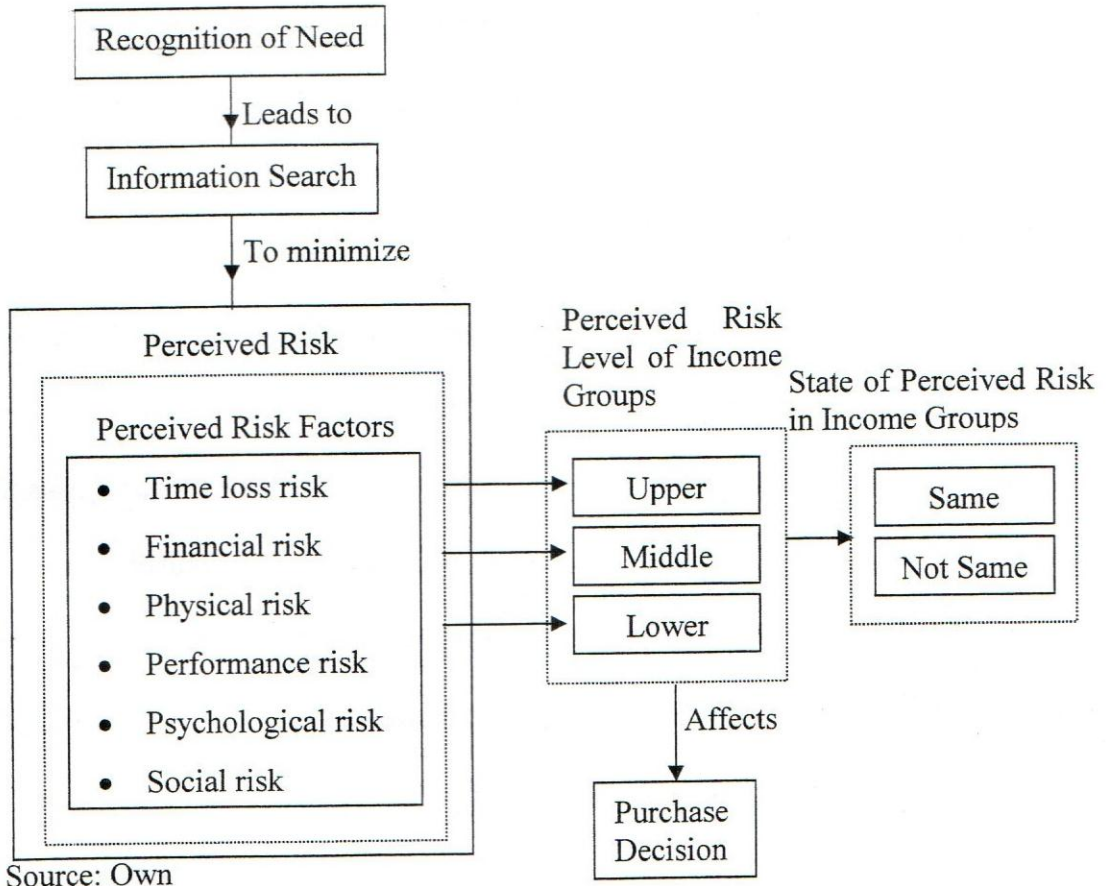
3.0 Study Area

The study area was Nakuru municipality. The focus was on personal computer users in Nakuru municipality. Nakuru municipality is in the Rift Valley province of Kenya some 155km north west of Nairobi. Nakuru municipality is one of the business, industrial and academic centres in Kenya. Given its cosmopolitan population, the presence of learning institutions such as the universities of Egerton, Jomo Kenyatta, Nairobi and a host of middle level colleges, was able to provide the target population of computer users.

3.1 The Population

The population under study was composed of all personal computers users who own personal computers within Nakuru municipality.

3.2 The Sampling Procedure

The sample frame consisted of owners of personal computer who use them. Purposive sampling was used to select a total of 60 respondents who were then grouped in various income groups. Due to the fact that the sample characteristic is rare and that it was extremely difficult and cost prohibitive to locate respondents it was prudent to use the stated sample size. Other researchers have also used a sample size of about 60 which they considered to be adequate. For example Younghwa (2003) used 68 respondents in his study on perceived risks and product information by product categories at cyber-shopping malls.

3.3 Data Collected

Data that was collected was on perceived risk factors in the following areas: time loss risk, financial risk, physical risk, performance risk, psychological risk, and social risk.

3.4 Data Collection Instruments

The study collected primary data through use of a questionnaire. This involved the use of a closed ended questionnaire which was given to personal computer users who own personal computers by research assistants. The questionnaires were administered to respondents in their homes on a drop and pick basis and in some cases self administered. The questionnaire was used because it is cost effective, respondents were likely to perceive it as anonymous and besides it was to allow respondents time to think and also allow contact to otherwise inaccessible respondents. All of the variables considered were measured on a 5-point Likert scale (from 1=strongly disagree to 5=strongly agree). Each respondent was given a questionnaire and they then rated a scale for risk factors and the overall risk levels.

3.5 Data Analysis and Test of Hypotheses

The Statistical Package for Social Sciences (SPSS) was the analysis tool. The completed questionnaires were edited for completeness to ensure accuracy and consistency of information obtained. Descriptive analysis, which includes frequencies, pie charts, bar graphs and means was also used.

To test both the first and the second hypotheses, the study adopted a Kruskal – Wallis H – test statistic to test whether there is a significant difference in perceived risk factors among the income groups and whether there is a significant difference in the overall perceived risk level of the three income groups of lower, middle and upper. Responses from individual respondents were summed up and then ranked. The ranks for the three income groups were then established. The H – test statistic was then computed and compared against the critical value for 2 degrees of freedom at 0.05 level of risk. If the computed value of the test statistic H was less than or equal to the tabulated value we did not reject the null hypothesis, otherwise, we rejected.

3.6   Model Description

The equation was specified in the following form (Marson, et, al. 1996)

$$H = \left\{ \frac{12}{N(N+1)} \times \left[\frac{\left(\sum R_U\right)^2}{n_U} + \frac{\left(\sum R_M\right)^2}{n_M} + \frac{\left(\sum R_L\right)^2}{n_L} \right] \right\} - 3(N+1)$$

With k – 1 degrees of freedom (K is the number of population groups)

Where

$\sum R_U$ -   Sum of the ranks of samples in upper income group

$\sum R_L$ -   Sum of the ranks of samples in the lower income group

$\sum R_M$ -   Sum of the ranks of samples in the middle income group

n_U -   Sample size for upper income group

n_L -   sample size for the lower income group

n_M - sample size for the middle income group

N - The combined number of observations for all samples

# CHAPTER FOUR: DATA ANALYSIS AND DISCUSSION

4.0   Preliminary Findings

In this chapter an analysis of the information collected by way of questionnaire is carried out. Of the 60 questionnaires that were given out, 57 were returned filled. This accounted for 95 percent response. Of the 57 questionnaires returned, 18 were in the upper income group, 27 in the middle income group and 12 in the lower income group.

4.1 Distribution of Risk Factors among the Income Groups

The distribution of risk factors among the income groups varied. In all the income groups respondents felt that financial and functional risk factors were the most important with a slight variation in the percentages. Figures 3 to 5 show this variation.
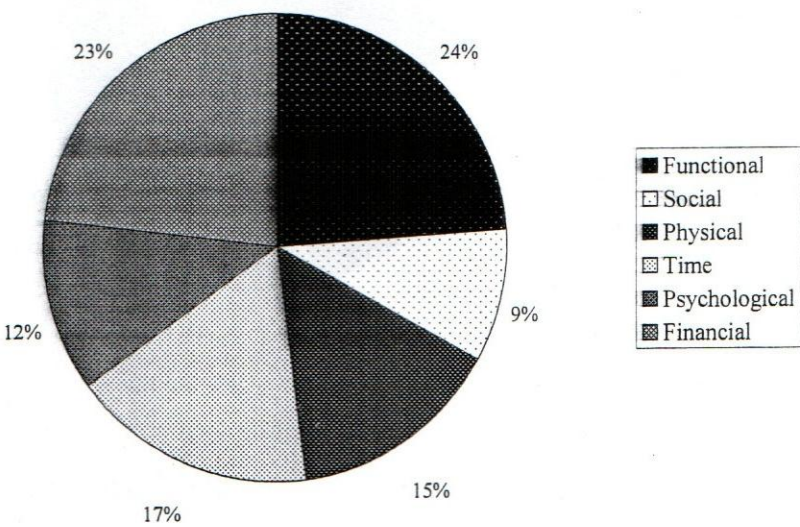
Figure 4: Risk factors in the upper income group
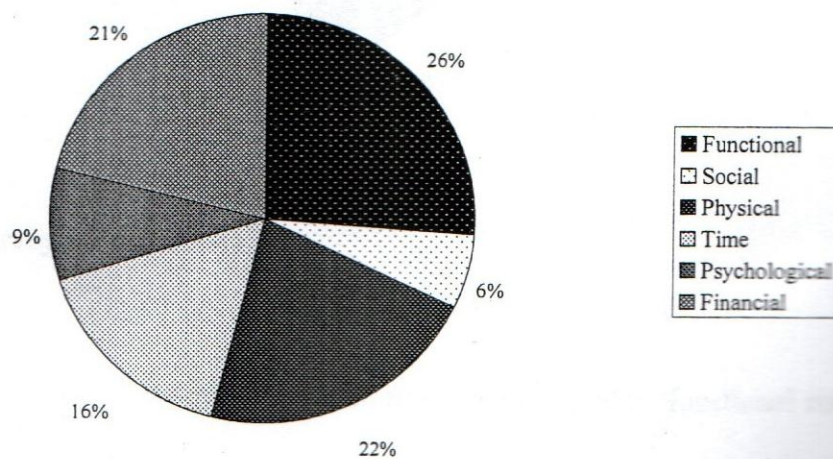
Source: (Survey results, 2004)

In the upper income group 26% of respondents perceive functional risk to be the most important risk factor followed by physical at 22%, financial at 21%, time at 16%, psychological at 9% and social risk factor at 6%. The implication being they are more preoccupied with the performance of personal computer. They will worry about the speed, accuracy and storage of the personal computers which are some of the parameters used to measure personal computer performance.

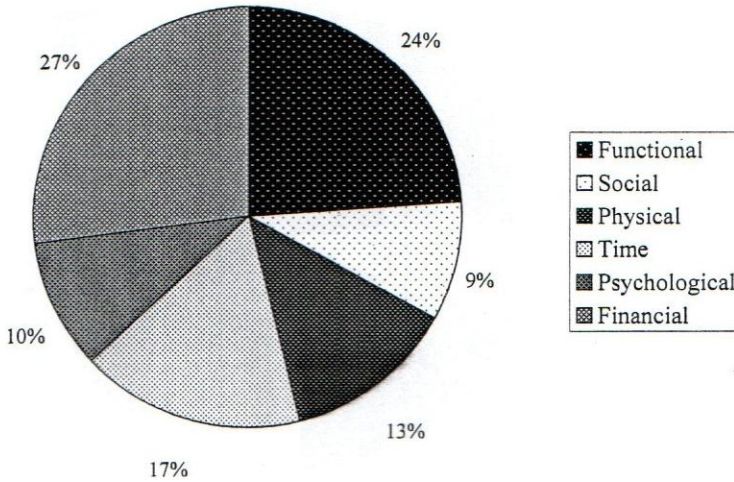Figure 5: Risk factors in the middle income group

Source: (Survey results, 2004)

In the middle income group 24% of the respondents perceive functional risk to be the most important followed by financial risk factor at 23%, time at 17%, physical at 15% psychological at 12% and social at 9%. This group is also preoccupied with personal

computer performance. They will worry about speed in terms of processing speed, access speed, accuracy and even the amount of storage which are some of the measures of computer performance.

Figure 6: Risk factors in the lower income group

Source: (Survey results, 2004)

In the lower income bracket, 27% of the respondents perceive financial risk factor to be the most important risk factor followed by functional at 24%, time at 17%, physical at 13%, psychological at 10% and social at 9%. This group is price sensitive. They will worry about the initial cost and even the operating cost. They are bound to search for the cheapest personal computer in the market.

4.2 Distribution of Risk Factors for the Combined Income Groups

Summing the ranks of the individual risk factor for all the respondents functional risk was considered to be the most important risk factor, followed by financial, physical, time psychological and lastly social. This is shown in Figure 6 below

Figure 7: Risk factors for combined income groups
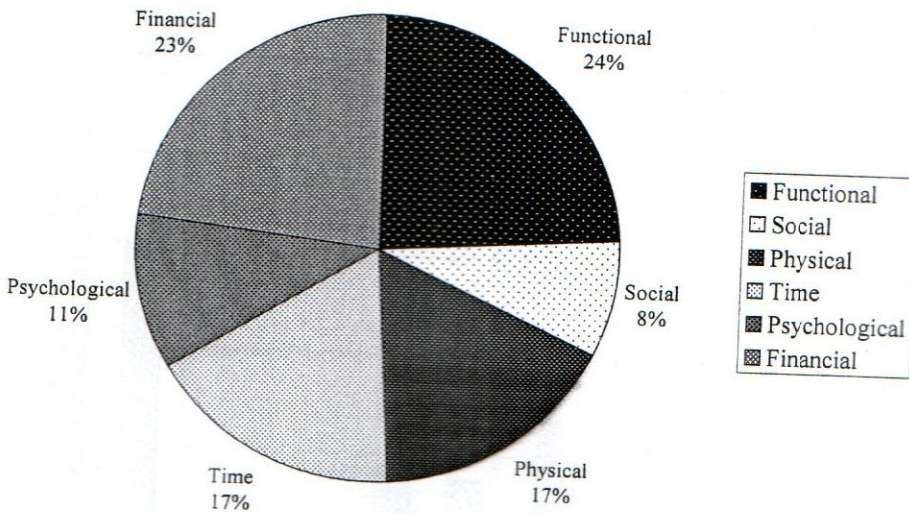
Source: (Survey Results, 2004)

On the whole 24% of personal computer users perceive functional risk to be the most important risk factor closely followed by financial risk factor at 23%, then physical and time at 17%, psychological at 11% and lastly social at 8%. The implication is that personal computer users are more worried about computer performance. They will worry about speed, accuracy and even storage as some of the parameters that measure performance.

4.3 Comparison of Risk Factors among the Income Groups

Upper income group perceived functional risk as the most important risk factor followed by the middle and then the lower income group. For social risk, the lower income group perceived it as the most important followed by the middle and the upper income groups.

Figure 8: Comparison of Income groups per risk factor
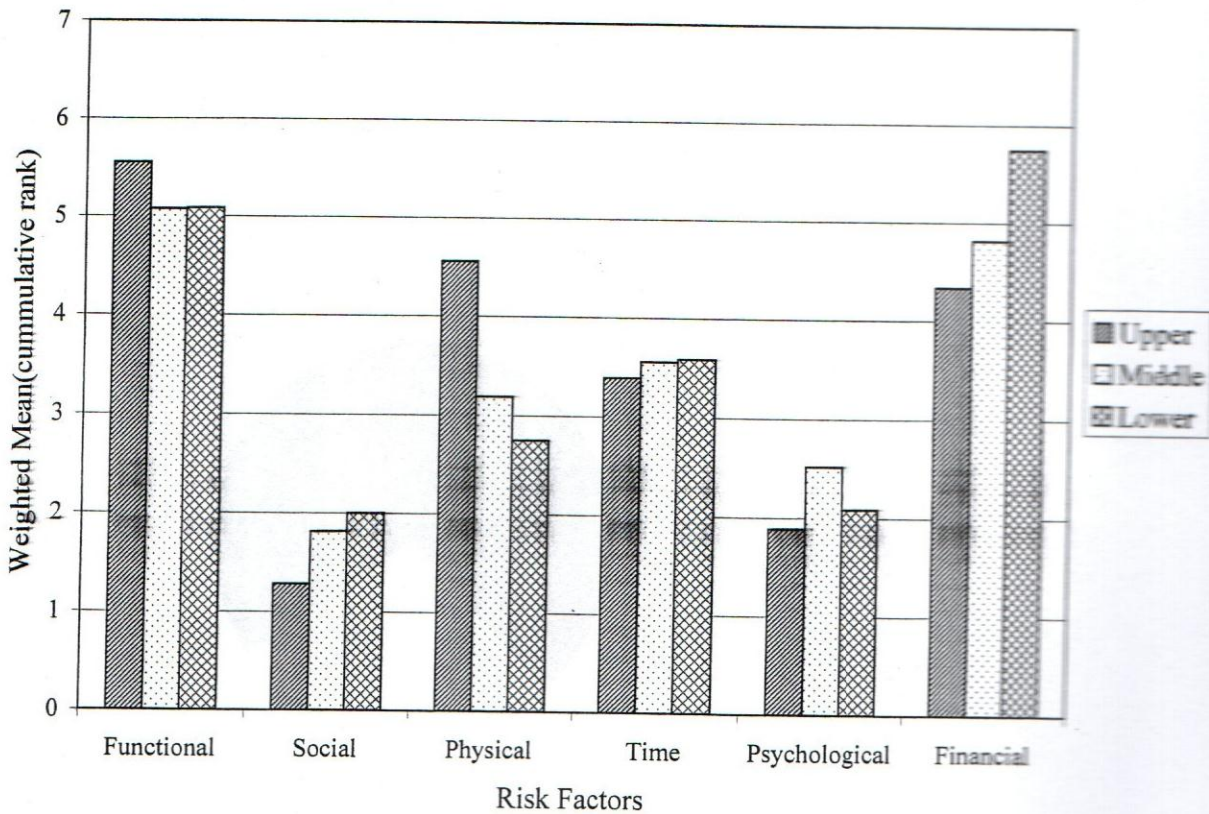
Source: (Survey Results, 2004)

For the physical risk, the upper income group perceived it as the most important followed by the middle and then the lower income group. For time risk, the lower

income group perceived it as the most important followed by the middle and lastly the upper income group. For psychological risk, the middle income group perceived it as the most important followed by the lower group and then the upper income group. Lastly for the financial risk, the lower income group perceived it as the most important followed by the middle and then the upper income group. Figure 7 shows how the different income groups compared in the ranking of the risk factors.

4.4 Overall Perceived Risk Levels

Figure 9: Overall risk level per income group

35%   38%

| ■ Lower |
| □ Upper |
| ■ Middle |

27%
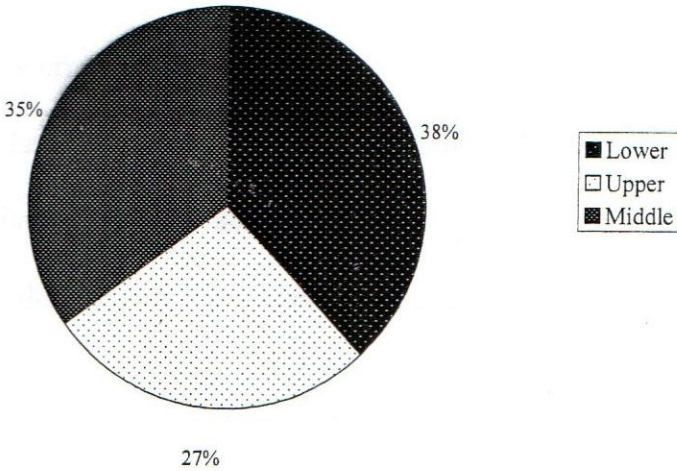
Source: (Survey Results, 2004)

On the whole the lower income group perceived the highest overall risk level during the pre- purchase phase of personal computers at 38% followed by the middle income group

at 35%. The upper income group perceived the lowest overall risk level at 27%. Figure 8 shows the overall risk level per income group. The lower income group is the group which is more risk averse and therefore more attention should be redirected towards this group in terms of risk reduction strategies specifically targeting this group.

4.5 Results of Hypothesis Testing

The hypotheses were tested using Kruskal – Wallis test statistic. The null hypothesis was rejected if $X^2 > 5.991$. The degrees of freedom (df) used was 2 since there were three income groups. The risk level (α) was taken to be 0.05.

4.5.1   Financial Risk Factor

In testing the hypothesis that financial risk factor does not significantly differ among the income groups, the critical value was found to be 5.991. The computed value H (13.52) was greater than the tabulated value of 5.991. Therefore the null hypothesis was rejected and the alternative hypothesis accepted. The implication of this therefore is that marketers should differentiate their marketing strategy using financial risk factor as a basis.

4.5.2   Functional Risk Factor

In testing the hypothesis that functional risk factor does not significantly differ among the income groups, the critical value was found to be 5.991. The computed value H (4.78) was less than the tabulated value of 5.991. Therefore the null hypothesis was

accepted. The implication is that the same marketing strategy should be adapted across the income groups based on functional risk factor.

4.5.3 Physical Risk Factor

In testing the hypothesis that physical risk factor does not significantly differ among the income groups, the critical value was found to be 5.991. The computed value H (18.91) was greater than the tabulated value of 5.991. Therefore the null hypothesis was rejected and the alternative hypothesis accepted. The implication is that each income group requires a different strategy. No common approach should be adapted when it comes to physical risk factor.

4.5.4 Psychological Risk Factor

In testing the hypothesis that psychological risk factor does not significantly differ among the income groups, the critical value was found to be 5.991. The computed value H (2.30) was less than the tabulated value of 5.991. Therefore the null hypothesis was accepted. The implication of this is that the same marketing approach should be adapted for all the income groups on this risk factor.

4.5.5 Time Risk Factor

In testing the hypothesis that time risk factor does not significantly differ among the income groups, the critical value was found to be 5.991. The computed value H (0.65) was less than the tabulated value of 5.991. Therefore the null hypothesis was accepted.

The implication is adapting the same marketing strategy for the three income groups on this risk factor.

4.5.6   Social Risk Factor

In testing the hypothesis that social risk factor does not significantly differ among the income groups, the critical value was found to be 5.991. The computed value H (2.16) was less than the tabulated value of 5.991. Therefore the null hypothesis was accepted. The implication is adapting the same marketing approach for all the income groups on the social risk factor.

4.5.7   Overall Perceived Risk Level

In testing the hypothesis that perceived risk levels do not significantly differ among the income groups, the critical value was found to be 5.991. The computed value H (24.30) was greater than the tabulated value of 5.991. Therefore the null hypothesis was rejected and the alternative hypothesis accepted. The implication is that marketers should use different marketing approaches as different income groups have different levels of overall perceived risk.

CHAPTER FIVE: SUMMARY AND CONCLUSION

5.0   Conclusion and Summary of Findings

The results show that 24% of respondents chose functional risk to be the most important risk factor, followed by the financial risk at 23%, physical and time risk were ranked third at 17%, then followed psychological at 11% and lastly social risk at 8%.

Respondents in the lower income bracket recorded the highest risk level and placed a lot of premium on the financial risk factor since they ranked it as the most important risk factor at 27%. Both the middle and the upper income groups worried more about the functionality of the personal computer at 24% and26% respectively even though the upper income group registered the lowest overall risk level.

The results of the Kruskal – Wallis H – test carried out on each risk factor showed that only financial and the physical risk factors differed significantly among the income groups in the pre – purchase phase of personal computers.   There was no significant difference in the way respondents in various income groups viewed functional, social, psychological and time risk factors. The implication to marketers being the adaptation of the same strategy where differences do not occur and a differentiated strategy where there are differences.

On the overall perceived risk level a Kruskal – Wallis H – test carried out revealed a significant difference in the perceived risk levels among the income groups in the pre –

purchase phase of personal computers. The implication to marketers being adaptation of a differentiated approach as befits each income group.

5.1 Recommendations from the Findings

Marketers should use financial and physical risk factors as a basis for differentiating personal computers since risk facets were significantly different among the various income groups. This could be attained by a variation of the marketing mix to satisfy unique needs of the varied income groups.

Since individuals act and react on the basis of their perceptions, not on the basis of the objective reality, proper positioning, and appropriate advertising could influence perceptions regarding perceived risks (Sciffman et al 1999). This therefore means that an individual's perceived risks of a product can be manipulated. This could be done by showing that benefits derived from personal computers ownership far outweigh the perceived risks and more especially financial and physical risks. In this regard adverts could be useful in shaping perceptions held by consumers about personal computers.

5.2 Suggestions for Further Research

In this study reasons as to why personal computer users buy computers were not established. There is need to determine this as it will help in determining why various consumers are averse to the risks that affect them.

This study established differences in overall perceived risks levels among the various income groups, no attempt was made to measure this differences. There may be need to quantify this differences so that we know the exact gap and therefore determine ways to bridge the gap.

This study established risk factors where we had significant differences to be the most important risk factors. There is need therefore to identify perceived risk factors unique to various income groups.

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APPENDIX

Appendix I: Income Category Breakdown

Classification	p.a (ksh.)	p.m (ksh.)
Lower	0 – 240,000	0 – 20,000
Middle	240,001 – 720,000	20,001 – 60,000
Upper	More than 720,000	More than 60,000

Source: World Bank estimates of 2001 GNI per capita.

Appendix II: Kruskal – Wallis Test Results

Kruskal-Wallis Test (Financial Risk Factor)

Ranks

	Group	N	Mean Rank
Financial	1.00	12	42.67
	2.00	27	28.26
	3.00	18	21.00
	Total	57	

Test Statistics(a,b)

	Financial
Chi-Square	13.515
df	2
Asymp. Sig.	.001

a Kruskal Wallis Test
b Grouping Variable: Group

Kruskal-Wallis Test (Functional Risk Factor)

Ranks

	Group	N	Mean Rank
Functional	1.00	12	22.50
	2.00	27	28.15
	3.00	18	34.61
	Total	57	

Test Statistics(a,b)

	Functional
Chi-Square	4.779
df	2
Asymp. Sig.	.092

a Kruskal Wallis Test
b Grouping Variable: Group

Kruskal-Wallis Test (Physical Risk Factor)

Ranks

	Group	N	Mean Rank
Physical	1.00	12	18.38
	2.00	27	25.02
	3.00	18	42.06
	Total	57	

Test Statistics(a,b)

	Physical
Chi-Square	18.912
df	2
Asymp. Sig.	.000

a Kruskal Wallis Test
b Grouping Variable: Group

Kruskal-Wallis Test (Psychological Risk Factor)

Ranks

	Group	N	Mean Rank
Psychological	1.00	12	27.88
	2.00	27	32.13
	3.00	18	25.06
	Total	57	

Test Statistics(a,b)

	Psychological
Chi-Square	2.299
df	2
Asymp. Sig.	.317

a Kruskal Wallis Test
b Grouping Variable: Group

Kruskal-Wallis Test (Social Risk Factor)

Ranks

	Group	N	Mean Rank
Social	1.00	12	32.83
	2.00	27	29.76
	3.00	18	25.31
	Total	57	

Test Statistics(a,b)

	Social
Chi-Square	2.157
df	2
Asymp. Sig.	.340

a Kruskal Wallis Test
b Grouping Variable: Group

Kruskal-Wallis Test (Time Risk Factor)

Ranks

	Group	N	Mean Rank
Time	1.00	12	31.88
	2.00	27	28.96
	3.00	18	27.14
	Total	57	

Test Statistics(a,b)

	Time
Chi-Square	.645
df	2
Asymp. Sig.	.724

a Kruskal Wallis Test
b Grouping Variable: Group

Kruskal-Wallis Test (Overall Risk Level)

Ranks

	Group	N	Mean Rank
Overall	1.00	12	42.75
	2.00	27	32.83
	3.00	18	14.08
	Total	57	

Test Statistics(a,b)

	Overall
Chi-Square	24.295
df	2
Asymp. Sig.	.000

a Kruskal Wallis Test
b Grouping Variable: Group

Appendix III: Questionnaire

I am a post graduate student in the Faculty of Commerce of Egerton University. In partial fulfillment of the requirements of the Masters degree in Business Administration, I am conducting a study entitled 'perceived risk factors by personal computer users in the pre – purchase phase: a case of users in different income groups in Nakuru municipality'. You have been selected to form part of this study. I therefore kindly request your assistance in completing this questionnaire. The information and data required is purely for academic purposes only and will be treated in confidence.

Section I – Importance of perceived risk factors

The risk factors in question are those considered before you purchased your personal computer. A risk factor is more important than the other if it is considered to be riskier.

Please rank the perceived risk factors below in order of their importance

Most important   Least

important   6   5   4   3   2   1

    Functional   (   )

    Social   (   )

    Physical   (   )

    Time   (   )

Psychological   (   )

Financial   (   )

Section II – Overall perceived risk level

Please circle the choice after each statement that indicates your opinion on the

perceived risk factors on the purchase of personal computers.

Before I bought a personal computer

	Strongly agree	Agree	Undecided	Disagree	Strongly disagree
Perceived performance risk					
1. I was worried that it would not function well	5	4	3	2	1
Perceived financial risk					
2. I considered its purchase an expensive affair.	5	4	3	2	1
3. I considered its replacement in the event that it was stolen or malfunctioned or became obsolete to be costly	5	4	3	2	1
Perceived social risk					
4. I worried about what my friends and peers would think of.	5	4	3	2	1
5. I considered owning it to be consistent with the way I viewed myself	5	4	3	2	1
Perceived psychological risk					
6. I worried about making the wrong choice and regretting later.	5	4	3	2	1

Perceived physical risk

7. I was concerned about radiations
   emitted by the monitor/screen   5   4   3   2   1

8. I worried about being injured by
   personal computer thieves   5   4   3   2   1

Perceived time risk

9. I worried about making the wrong
   choice and therefore having to go
   through the entire shopping effort
   again.   5   4   3   2   1

10. I worried about the search for a
    competent repair outlet   5   4   3   2   1

11. I worried about the time it would
    take me to know how to use it well
                              5   4   3   2   1

Section III – Income Groups

Please tick the category of monthly income bracket in (ksh.) you fall in.

☐   0 – 20,000

☐   20,001 – 60,000

☐   more than 6