CONSUMER DECISION MAKING IN SELECTING LAPTOP USING ANALYTICAL HIERARCHY PROCESS (AHP) METHOD (STUDY: HP, ASUS AND TOSHIBA)

PENGAMBILAN KEPUTUSAN PELANGGAN DALAM MEMILIH LAPTOP MENGGUNAKAN METODE PROSES HIRARKI ANALITIK (KASUS: HP, ASUS DAN TOSHIBA)

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Abstract: Developing laptop brings revolution in people daily life, it increases people standard of living and has great effect on business, science, education, medical sector, transportation and so on. This research used Analytical Hierarchy Process (AHP) to compare each laptop based on the criteria; value added features, peripheral specifications, core technical features, physical appearance and price and payment conditions. The respondent is 50 people and this research using purposive sampling. The respondent of this research is the people that have an experience used that three laptop. The result shows that Peripheral Specification is the most important criteria, followed by Core Technical Features factor, Value Added Features factor, followed with Price and Payment Condition and the last Physical Appearance factor. As the result, there are two from five criteria that influence the consumer to choose laptop. Peripheral Specification is the most preferred criteria compare with the others. Core Technical Features is in second position as the most preferred criteria chose by respondent. In best laptop result, HP become the best laptop chose by respondent, followed by ASUS and TOSHIBA chose by consumer that have an experience used that three laptop.

Keywords: customer decision making, AHP

Abstract: *Pengembangan laptop membawa revolusi dalam kehidupan sehari-hari, meningkatkan standar hidup orang dan memiliki pengaruh besar pada bisnis, ilmu pengetahuan, pendidikan, sektor kesehatan, transportasi dan sebagainya. Penelitian ini menggunakan Analytical Hierarchy Process (AHP) untuk membandingkan setiap laptop berdasarkan kriteria; nilai tambah fitur, spesifikasi sekeliling, fitur teknis inti, tampilan fisik dan harga dan kondisi pembayaran. Responden penelitian 50 orang dan penelitian ini menggunakan purposive sampling. Responden penelitian adalah orang-orang yang memiliki pengalaman menggunakan tiga laptop. Hasil penelitian menunjukkan Spesifikasi Sekeliling adalah kriteria yang paling penting, diikuti oleh faktor Fitur Teknis Inti, factor Nilai Tambah Fitur, diikuti dengan Harga dan Kondisi Pembayaran dan faktor Penampilan Fisik. Sebagai hasilnya, ada dua dari lima kriteria yang mempengaruhi konsumen untuk memilih laptop. Spesifikasi Sekeliling adalah kriteria yang paling disukai dibandingkan dengan yang lain. Fitur Teknis inti berada di posisi kedua sebagai kriteria yang paling disukai dipilih oleh responden. Dalam hasil laptop terbaik, HP menjadi laptop terbaik dipilih oleh responden, diikuti oleh ASUS dan TOSHIBA dipilih oleh konsumen yang telah pengalaman menggunakan tiga laptop.*

Kata kunci: pengambilan keputusan pelanggan, AHP

INTRODUCTION

Research Background

We are all living in the 21st century. It is an era of science and technology. Modern technology has its effect on every field of life. With the help of technology the things that seemed impossible become easier. Nowadays people cannot imagine life without technology, everything people do or people used something surely related with technology. Information technology brings revolution in people daily life. It increases people standard of living. It has great effect on business, science, education, medical sector, transportation and so on.

Technology is defined as any tool, device, program or system that when applied to the educational environment will increase productivity, creativity and achievement. These technologies are computers, TVs, overhead projectors, satellite broadcast systems, and other forms of existing technologies as well as those not yet invented. Talk about computers, there are two types of computers that are the most common people use are personal computer and laptop computer. Most people would say that there is not that much difference between the two, but they have no idea how wrong they are.

Firstly, personal computer is what the majority of the people have in their homes. PC is a term that means personal computer use. With personal computers, people can use it at home, school, or at a business. These computers can store abundant memory and space. Computers themselves have a glass monitor, like a television screen, which enables people to see more colors. It also has a higher resolution rate so people can see more clearly. Personal computer can have some remarkable features added to it. People can add printers, bigger speakers, desktop scanner beds, and best of all, a bigger hard drive.

Secondly, laptop is a computer that is light weight and portable for easy transportation, which makes life easier to take on business trips, vacations, and anywhere people want to take it. Laptop simply means that people can set the computer down on their lap, desk, or on any flat surface. Laptop computers themselves have a plastic screen that reduces the resolution rate. This is why people have such a hard time seeing things on the computer. No matter where people sit in front of the computer screen, it will always produce different colors; therefore, making it harder to read the screen.

Research Objectives

The objective of this research is to know what brand of laptop that people prefer the most.

THEORETICAL REVIEW

Consumer Decision Making

Schiffman and Kanuk (2007:3) defines customer decision making as the process of making purchase decisions based on cognitive and emotional influences such as impulse, family, friends, advertisers, role models, moods, and situations that influence a purchase. Kotler and Armstrong (2006:5) broadly defined marketing as a social and managerial process by which individuals and groups obtain what they need and want through creating and exchanging value with other. In a narrower business context, marketing involves building profitable, value laden exchange relationship with customers. Marketing as the process by which companies create value for customers and build strong relationship in order to capture value from customers in return. It can be conclude that customer decision making the step of making a decision in purchasing a product.

Consumer Behavior

Peter and Olson (2004:7) defines consumer behavior is the study of individuals, groups or organizations and the processes they use to select, secure, use and dispose on products, services, experiences, or ideas to satisfy needs and the impacts that these processes have on the consumer and the society. Consumer behavior is a process that not only happen when consumer gives over money to seller in turn get good or service, but also the process that include the issues that influence the consumer before, during, and after purchase (Solomon 2011:34). It can be conclude that consumer behavior is the process by the consumer in selecting a product, use (consume), and dispose of product or service.

Previous Research

There are several literatures are used in supporting of this research that provide the grand concept and link between the previous research and this research, which are:

1. Sumi and Kabir (2010) Analytical Hierarchy Process for Higher Effectiveness of Buyer Decision Process, Buyer decision processes are the decision-making processes undertaken by consumers about a potential market transaction before, during, and after the purchase of a product or service. More generally, decision-making is the cognitive processes of selecting a course of action from among multiple alternatives. How many evaluation criteria a consumer will use, what different types of criteria will be considered and how much importance will be placed on each of them depends on the consumer himself and the product consideration. The Analytical Hierarchy Process (AHP) is a multi-criteria decision-making process that is especially suitable for complex decisions, which involve the comparison of decision elements, which are difficult to quantify. The crux of AHP is the determination of the relative weights to rank the decision alternatives. In this study, it has been identified that through using AHP model consumers can evaluate the product attributes differently from simple evaluation criteria. AHP process described an effective buying decision by finding out the effectual attributes of different alternatives.

2. Nasır, et al (2006) Usage of Group AHP Approach in Sport Shoes Selection, Rapid developments in IT sector accompanied by increased competition and acquisitions and mergers in the market, lead both academicians and practitioners to concentrate on the consumers' purchase decisions in portable PC industry. The NDP group's report published by PC World state that in May 2003, U.S. retailers made more money selling laptop/notebook computers than they did selling desktops. It was the first time that laptops have outsold desktops in the U.S. This research seeks to develop a better understanding of the factors influencing consumers' laptop purchases. What makes this study distinctive from other sectoral studies is that, this research also seeks the differences among three consumer groups (stayers, satisfied switchers, and dissatisfied switchers) of a company with respect to the factors influencing consumers' laptop purchases. It is found that core technical features, post purchase services, price and payment conditions, peripheral specifications, physical appearance, value added features, and connectivity and mobility are the seven factors that are influencing consumers' laptop purchases. Furthermore, price and payment conditions factor shows significant difference among three consumer groups of a company's customer base.

3. Sharma (2012) A Study of Brand Choice of Laptops by Management and Engineering Students (A Case Study of Rohtak, Bahadur Garh City), Laptop market is a highly competitive market in the present scenario. Due to rapid changes in the field of technology day by day new laptop brands comes in to existence. Also, the consumer desires and expectations are moving on. It becomes difficult to survive for laptop manufacturers if they don't move fast with growing needs of consumers. This study presents a brief overview of Indian Laptop industry. The present paper highlights the laptop usage in study from student's point of view. The research paper further makes an attempt to identify and evaluate various factors which influence purchase indent of management and engineering students.
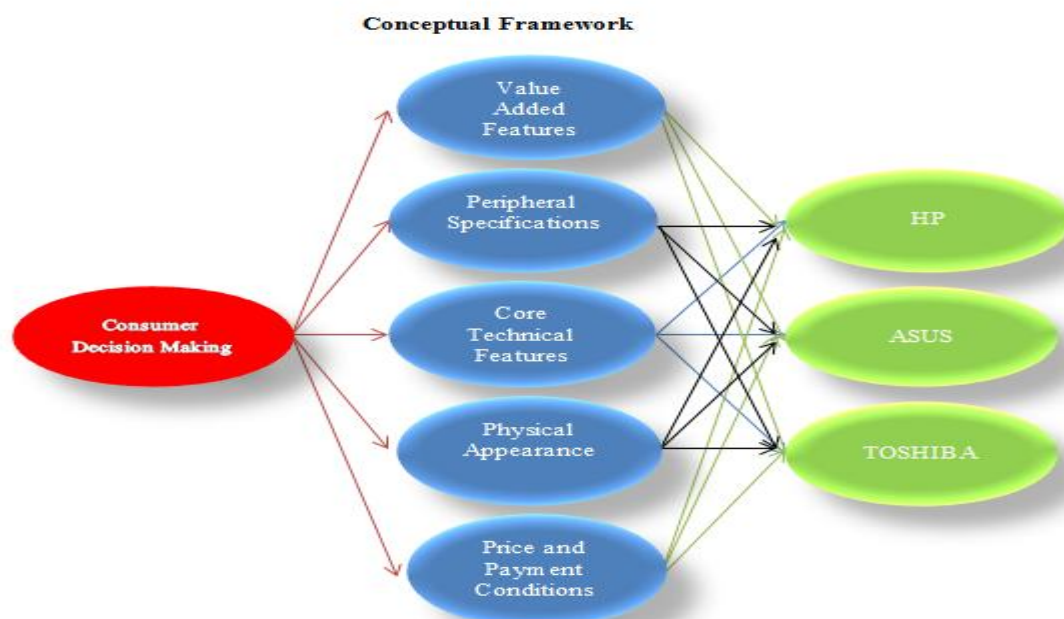
Conceptual Framework

Figure 1. Conceptual Framework
Source: Data Processed, 2016

RESEARCH METHOD

Type of research
This research uses quantitative method to analyze the data. The method used in this research is Analytical Hierarchy Process (AHP).

Place and Time of Research
This research will be conducted in Manado city. This research is held on Oct – Nov 2015.

Population and Sample
Population refers to the entire group of people, events, or things of interest that the researcher wishes to investigate. It is the group of people, events, or things of interest for which the researcher wants to make inferences based on sample statistics (Sekaran and Bougie 2009:262). Population in this research is people in Manado who have experience in using the laptop of HP, ASUS and TOSHIBA.   Sample is a relatively small subset of the population. It is drawn using either probability or nonprobability procedures Hair et al (2007:170). The sample of this research is all customers of HP, ASUS and TOSHIBA as many as 50 respondents that have experience of the laptop. The sampling design is purposive sampling. Purposive sampling or judgement sampling is a nonprobability sampling technique which an experienced individual selects the sample based on his or her judgement about some appropriate characteristic required of the sample member (Zikmund 2003:382).

Data Collection Method
Primary data refer to information obtained first-hand by the researcher on the variables of interest for the specific purpose of the study (Sekaran and Bougie 2009:180). Individuals provide information when interviewed, questionnaires, or observed. Group depth interviews, are another rich source of primary data. The data needed in this research will be collected using questionnaire because the data in questionnaire is relatively easy to analyse, they are simple to administer, the format is familiar to most respondent, and the respondents have time to think about their answer and they are not usually required to reply immediately.

Operational Definition of Research Variable
1. Customer decision making (Y) defined as a process of gathering and processing information, evaluating it and selecting the best possible option to make a buying choice or to make a decision regarding product and service offering.
2. Laptop (X) is the characteristic of laptop that will perceived by customer that influencing people (customer) or reason why people want to choose laptop.
3. Alternatives: (1) HP, (2) ASUS, (3) TOSHIBA
   .

Data Analysis Method
Taylor (2013:440) defined the Analytic Hierarchy Process (AHP), develop by Thomas Saaty, is a method for ranking decision alternatives and selecting the best one given multiple criteria. The AHP generates a weight for each evaluation criterion according to the decision maker's pairwise comparisons of the criteria. AHP combines the criteria weights and the options scores, thus determining a global score for each option, and a consequent ranking. The global score for a given option is a weighted sum of the scores obtained with respect to all the criteria. One common scale for AHP (adapted from Saaty) is:

Table 1. Preference Scale for Pair-wise comparison

Preference Level	Numerical Value
Equally preferred	1
Equally to moderately preferred	2
Moderately preferred	3
Moderately to strongly preferred	4
Strongly preferred	5
Strongly to very strongly preferred	6
Very strongly preferred	7
Very strongly to extremely preferred	8
Extremely preferred	9

Source: Taylor(2013), Introduction to Management Science 11th Edition

Following is a summary of the mathematical steps used to arrive at the AHP-recommended decision (Taylor, 2013:445):
1. Develop a pairwise comparison matrix for each decision alternatives (site) for each criterion.
2. Synthesization:
    a. Sum the value in each column of the pairwise comparison matrices.
    b. Divided each value in each column of the pairwise comparison matrices by the correspondent column sum-these are the normalized matrices.
    c. Average the values in each row of the normalized matrices-these are the preference vectors.
    d. Combine he vectors of preferences for each criterion (from step 2c) into one preference matrix that shows the preference for each site for each criterion.
3. Develop a pairwise comparison matrix for the criteria.
4. Compute the normalized matrix by dividing each value in each column of the matrix by the corresponding column sum.
5. Develop the preference vector by computing the row averages for the normalized matrix.
6. Compute an overall score for each decision alternative by multiplying the criteria preference vector (from step 5) by the criteria matrix (from step 2d).
7. Rank the decision alternatives, based on the magnitude on their scores computed in step 6.

RESULT AND DISCUSSION

Result
Table 2. Result of The Overall Criteria

Factors				
Value added features	Peripheral specification	Core technical features	Physical appearance	Price and payment condition
0.2129	0.3004	0.229	0.1271	0.1307

Source: data processed, 2016

The result shows that the highest score is peripheral specification (0.3004). It means that peripheral specification is the factor that influence the most people to choose laptop. The second highest score is on core technical features (0.229) which means on core technical features has the second highest influence on the choice of customer. Value added features in third position (0.2129) and Physical appearance as the lowest important criteria (0.1271). The result is valid since because based on the data the overall inconsistency is 0.0662. In general, the degree of consistency is satisfactory (acceptable) if overall inconsistency $\leq$ 0.10. It means the data comparison in this result is valid and consistent.

Table 3. Result of AHP of Consumer Preferred Laptop

HP	ASUS	TOSHIBA
0,533	0.327	0.140

Source: data processed, 2016

The research shows that based on all the criteria, costumer choose HP as the most preferred laptop. HP have the highest score (0.533), followed by ASUS(0.327), and then TOSHIBA (0.140). The result is valid since the data comparison by respondent is valid and consistent as shown by the overall inconsistency of result for all criteria which is 0.05. In general, the degree of consistency is satisfactory (acceptable) if overall inconsistency $\leq$ 0.10.

Discussion

Pairwise comparison for the main criteria analysis

Taylor (2013:441), in AHP the decision maker determines how well each alternative score on a criterion by using pairwise comparison. AHP determines the relative importance or weight of the criteria by ranking the criteria from most important to least important. The most important one that influence customer is First, for the overall of five main criteria value added features, peripheral specifications, core technical features, physical

appearance and price and payment conditions, the most important one that influence customer is "peripheral specifications".

Peripheral specifications are the highest-influencing criteria because people always look for the best peripheral specifications laptop when they want to choose laptop. They look for the stand-by duration, modem/ethernet, number of USB ports, speakers and amplifiers, DVD and CD player. Peripheral specification has the highest score compared to the other four criteria, and being the most crucial criterion that preferred by respondents. The respondents are those who have experienced on each alternative provided which are the three laptop based on the requirement of using AHP method. So in this research, according to the respondents, peripheral specification becomes the most preferred factor for the customer in selecting laptop in Manado.

Second highes influence criteria is core technical features. When people choose to buying laptop, they will look at the core technical features from the laptop. Such as, which core that used, how much capacity of memory and hard disk they provide into that laptop and how much that the display resolution that available.

The third position, followed by value added features. Value added features are also one of the most important criteria for people when they want to choose laptop. This is because people see from spill resistant keyboard, ease of usage from that laptop, durability of chassis easily cracked or not, brand image, how the security of laptop they provide, and variety of accessories from that laptop.

Fourth position is price and payment condition. In terms of price and payment conditions, everything should be comparable straight between that price and quality. Furthermore, people look for the payment condition, what payment methods are allowed in the purchasing of laptop. Can people pay cash or credit, do people have a discount if buying that laptop, and can people pay via ATM, which ATM that available for the payment.

Last place is physical appearance. In choosing laptop, physical appearance seen from weight and dimension, design and color are interesting. Right now customer does not see the physical appearance at the laptop as important as the other four criteria when they go to choosing laptop. Therefore physical appearance got lowest score among the other criteria. But it does not mean that this criterion is not important, this criterion still important to the customer, but it is in the least important criteria resulted from the correspondent. From the result of the analysis, there are top three criteria that have the most influence on customer in selecting laptop. Peripheral specifications is the most preferred criteria for customer when selecting laptop, followed by core technical features and value added features criteria come in third place. This result supports the findings of Nasır et.al (2006) in his previous study seven factors which influence consumers' laptop purchase decisions. These factors can be stated as follows: core technical features, post purchase services, price and payment conditions, peripheral specifications, physical appearance, value added features, and connectivity and mobility. On the other hand, stayers, satisfied switchers and dissatisfied switchers demonstrate a significant difference only in one factor: price and payment conditions. The results show that when compared to stayers and satisfied switchers, dissatisfied switchers give less importance to price and payment conditions related factor.

Result of Analytical Hierarchy Process of consumer preferred laptop

So, based on the overall data, customer will choose HP as the most preferred laptop in Manado compared to the other alternatives. This result shown that when people want to choose laptop, they prefer to choose HP as the most preferred laptop among the other alternatives. HP has the highest score, in the second position is ASUS, and followed by TOSHIBA in the last position.

CONCLUSION AND RECOMMENDATION

Conclusion

The result of this research shows the conclusion stated below, which are;

1. That result developed using Analytical Hierarchy Process (AHP), shows that HP become the most preferred laptop by the customers with score (0.533), in the second position is ASUS with score (0.327), and TOSHIBA in the last position with score (0.140).
2. That result on five criteria (value added features, peripheral specifications, core technical features, physical appearance and price and payment conditions), there are top three criteria that have the highest influence on customer in selecting laptop in Manado. Peripheral Specification gets the highest score or gives highest

influence on the choice of costumer. Second highest score goes to core technical features, and then value added features criteria come in third place.

Recommendation

There are three recommendations based on the conclusion above, which are:

1. Peripheral specifications has important role in selecting laptop followed by core technical features and value added features by respondents. In this peripheral specification factor, ASUS is better compare than HP and TOSHIBA. As a recommendation for HP and TOSHIBA the company must develop more in peripheral specification such as put more the USB ports, increase the quality of DVD/CD player and speakers amplifier so they can compete with ASUS.

2. For the customer in Manado if you to buying a laptop, researcher recommended to choose HP because based on the result of this research shows that HP is better than ASUS and TOSHIBA based on four factor value added features, peripheral specifications, core technical features, physical appearance and price and payment conditions.

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