
**THE ANALYSIS OF INTERNET SERVICES USING ANALYTICAL HIERARCHY
PROCESS METHOD IN MANADO (CASE STUDY: TELKOMSEL, XL AND 3)**

*ANALISIS LAYANAN INTERNET DENGAN MENGGUNAKAN METODE PROSES HIRARKI
ANALITIS DI MANADO (STUDI KASUS : TELKOMSEL, XL DAN 3)*

By:

**F. Gerald Lumempouw¹
Sifrid Pangemanan²
Merinda Pandowo³**

Faculty of Economics and Business, International Business Administration, Management Program
Universitas Sam Ratulangi Manado

E-mail :

[1geraldylumempouw@gmail.com](mailto:geraldylumempouw@gmail.com)

[2sspangemanan@gmail.com](mailto:sspangemanan@gmail.com)

[3iinpan@yahoo.com](mailto:iinpan@yahoo.com)

Abstract: *Internet has become important things in human lives. Nowadays, some of people added internet as their primary needs. Consumer purchase decision is the process involved when individuals or groups select, purchase, use or dispose products, services or experience and ideas to satisfy their needs. It is important because in understanding customer decision making, we will understand how consumer make the purchase decision, how the process of decision making by customer from searching until selecting the product or service, and also we can know the factors that influence the decision making. Based on five criteria (restaurant price, usefulness, ease of use, enjoyment and speed), speed become the most influence to attract consumer followed by price. This research used quantitative method. Quantitative research seeks to quantify the data. The method used in this research is Analytical Hierarchy Process (AHP). AHP is a method for ranking decision alternatives and selecting the best one given multiple criteria. It allows users to assess the relative weight of multiple criteria or multiple options against given criteria in an intuitive manner.*

Keywords: *customer decision making, analytical hierarchy process*

Abstrak: *Internet telah menjadi hal penting dalam kehidupan manusia. Saat ini, beberapa orang menambahkan internet sebagai kebutuhan utama mereka. Keputusan pembelian konsumen adalah proses yang terlibat saat individu atau kelompok memilih, membeli, menggunakan atau membuang produk, layanan atau pengalaman dan gagasan untuk memuaskan kebutuhan mereka. Penting karena dalam memahami pengambilan keputusan pelanggan, kita akan mengerti bagaimana konsumen membuat keputusan pembelian, bagaimana proses pengambilan keputusan oleh pelanggan dari pencarian sampai memilih produk atau jasa, dan juga kita bisa mengetahui faktor-faktor yang mempengaruhi pengambilan keputusan. Berdasarkan lima kriteria (harga restoran, kegunaan, kemudahan penggunaan, kenikmatan dan kecepatan), kecepatan menjadi sangat berpengaruh untuk menarik konsumen diikuti oleh harga. Penelitian ini menggunakan metode kuantitatif. Penelitian kuantitatif berusaha untuk mengkuantifikasi data. Metode yang digunakan dalam penelitian ini adalah Analytical Hierarchy Process (AHP). AHP adalah metode untuk memilih alternatif keputusan dan memilih yang terbaik dengan beberapa kriteria. Hal ini memungkinkan pengguna untuk menilai bobot relatif beberapa kriteria atau beberapa pilihan terhadap kriteria yang diberikan secara intuitif.*

Kata Kunci: *keputusan pembeli, analisis hirarki proses*

INTRODUCTION

Research Background

Internet has become important things in human lives. The Internet has change in unimaginable ways a decade ago. Only in 2004/2005, at a time when there were about 1 billion Internet users, in 2015, it is expected that there will be 3 billion Internet users. Internet Service Provider (ISP) - sometimes called an internet access provider - is a telecommunications company that offers its customer's access to the internet.

3G is the third generation of wireless mobile telecommunications technology. Network service is growing fast, keep up with technology. Indonesia itself is now beginning to feel the presence of LTE 4G technology. The fourth generation mobile communication and technology service (4G) is a combination of 3G and WLAN, with the ability to transmit high quality video images and image transmission comparable in quality to high- definition television technology products (Haitao & Xiaomin, 2012). The adoption of the 3G & 4G mobile has showed steady growth across the world (Lee, Marcu & Lee, 2011). 3G & 4G becomes more and more popular in Indonesia. It is becomes strength for the big provider companies. The price and the speed of an Internet connection appear to be the primary reasons influencing consumer choice of their current internet service provider and consequently how they value and experience the internet. The five biggest provider companies in Indonesia are Telkomsel, 3, XL, indosat and Axis.

There are five companies that provide 3G & 4G connections for Manado city which is Telkomsel, 3 ,XL, Indoosat and smartfren. Among them Telkomsel, 3 and XL dominated the market in Manado. Since the speed of network become one of primary factor and these companies offer 3G & 4G connections to consumer, they lead the market in Manado. When they have a same offer, some factor will influence on people's behavior to choose mobile network. Besides the speed of connection, price also becomes the factor for consumer to choose a provider and followed by another factors like usefulness, ease of use, and enjoyment. These three companies compete to offer a low price product to attract consumer attentions. Besides all the factors that already mentioned above some strategy used by companies to grow their costumers such as give sponsored, made an event, advertising and many more.

Regarding the circumstance above, through this research will analyze that three provider companies in Manado (Telkomsel, 3 and XL) with the criteria that can influence consumer to select a provider, and try to find which provider to meet customers needs the most and which criteria has influence the most people in selecting a provider. Based on the background above, the aim of this research is "the analysis of internet services using Analytical Hierarchy Process method in Manado (case study: Telkomsel, 3 and XL)".

Research Objectives

The purpose is to identify which :

1. Provider people choose the most.
2. Criteria has influence the most in consumer to choose 4G provider.

THEORITICAL FRAMEWORK

Marketing

Marketing defined by Kotler and Keller (2012:3) is about identifying and meeting human and social needs. Marketing has two facts. First, it is a philosophy, an attitude, a perspective, or a management orientation that stresses customer satisfaction. Second, marketing is activities and processes used to implement this philosophy. Marketing is the activity, set of institution, and processes for creating, communicating, delivering, and exchanging offerings that have value for customers, clients, partners, and society at large.

Burns and Bush (2006:4) defined marketing as "an organization function, not a group of persons or separate entity within the firm. It is also a set of processes and not a single tactic such as creating and

end-aisle display. The processes create, communication, deliver value to customers. Marketing is not trying to sell customers something; rather, it is providing customers with something they value. The objective of marketing is to create and manage customer relationships for the benefit of the organization and its stakeholders”.

Consumer Behavior

Consumer behavior is defined as the behavior that consumers display in searching for purchasing, using, evaluating and disposing of products and services that they expect will satisfy their needs. Consumer behavior focuses on how individual make decisions to spend their available resources (time, money, effort) on consumption related items (Schiffman and Kanuk, 2004:6)

Consumer behavior is the study of individuals, groups, or organizations and the process they use to select, secure, use, and dispose of products, services, experiences, or ideas to satisfy needs and the impacts that these processes have on the consumer and society. (Hawkins, et al, 2004:7)

Perceived usefulness

Usefulness refer to that a service satisfies a need or requirement. Depending on different user perspectives usefulness can have different interpretations (Pagani, 2004). Before users choose a mobile network service, they would like to consider whether the service is useful to their work or study. It will influence consumers' attitude to use the mobile network services. Nysveen *et al.* (2005) argued that male (masculine) users to a larger extent will possess such extrinsic and instrumental motives for using mobile chat services.

Perceived ease of use

Perceived ease of use for services demands a user friendly. It refers to a tool that encourages services usages and the full exploitation of enhanced features by avoiding 3 important for predicting the effect of ease of use on intention to use technology on a general basis.

Price

Price is one of the factors in the marketing mix and is used in order to stimulate the consumer. Pagani (2004) shows that price is one of the most important determinants of adoption of multimedia mobile services in his works. Man and women have different reactions for the factors of price. It has showed a lot in the works that gender make difference in price. So we consider that gender can make difference for the intention to the mobile network services in terms of price.

Enjoyment

Perceived enjoyment refers to “the extent to which the activity of using the computer (technology) is perceived to be enjoyable in its own right, apart from any performance consequences that may be anticipated.”(Davis *et al.*, 1992) Davis and his colleagues also examined the impact of enjoyment on usage intention in an extension to TAM (Davis et al., 1989). Mobile network service can make users feel enjoyment;

Speed and Coverage

It is more probable that many wireless networks will be available, and all of them will provide services over a variety of geographical coverage areas at various speeds (Hills & Johnson, 1996). Speed and coverage refer to the natures that the mobile service have. Man and women may have different demand for the services that the mobile operators have provided like speed and the signal coverage.

Previous Research

The first article by Awni Rawashdeh (2015), The results indicate that the students' intention to use the 4G mobile services is determined by their understanding regarding the usefulness and its ease of use and access to the 4G mobile services' functions. Further, the results highlighted the importance of

the perceived ease of use toward the 4G mobile services in terms of how easy or effortless it is to communicate with one another.

The second article by Jlanan Zheng & Fangkai Li (2014), The initial purpose of this study was to analyze the gender impact on factors affecting consumers' intention to use different kinds of mobile network service. After reviewing the previous literature we found five factors that are very important for users to choose mobile networks, respectively perceived usefulness, and perceived ease of use, price, enjoyment and speed.

The third article by Solomon A. Keelson, Takoradi Polytechnic (2012), The findings identified unreliability of service, different call rate for difference operators, and reference group influence as some of the factors affecting choice of multiple services. The study also found increased mobile phone expenditure, the pain of looking for other sources of funding of mobile services, and missing important calls while receiving other calls as major prices to be paid for the use of single mobile phone services.

The fourth article by Dr. Ranjit Roy Ghatak (2016), the study is made to analyze the consumers' preference on selecting telecom operator in India using AHP model. This study emphasizes on the AHP ranking of the criteria customer value most while selecting telecom operator. Telecom operators must stress on improving these parameters in order to increase customer satisfaction and gain more customers. Study suggests that telecom operator should focus on quality of service because it turns out as most influential factor. Hence operators should device effective ways to improve quality.

RESEARCH METHOD

Type of Research

This research will use quantitative method. Quantitative research seeks to quantify the data. It seeks conclusive evidence based on large, representative samples and typically involving some form of statistical analysis (Maholtra, 2009:pp.180). The method used in this research is analytical Hierarchy Process (AHP).

Place and Time of Research

This research is conducted in Manado city. This research will be use customers that have experience at using those three providers as the respondent. This research will be held from July - August 2017.

Conceptual Framework

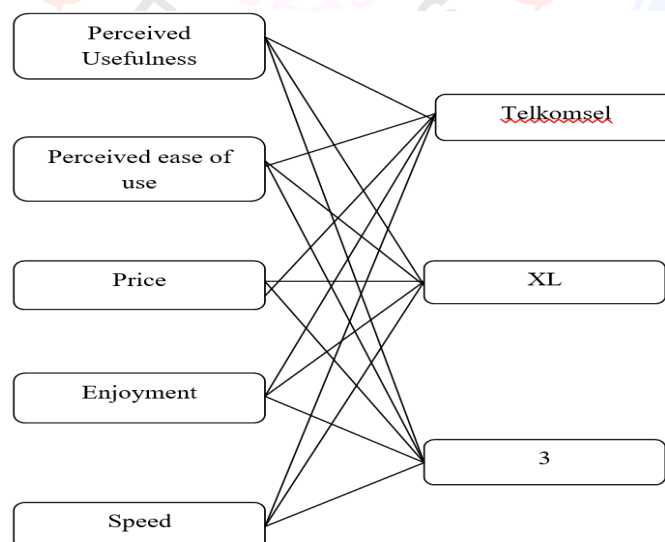


Figure 1. Conceptual Framework

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). Population in this research is people in Manado who have experience using Telkomsel, XL and Three. According to Sekaran and Bougie (2009) sample is a subset of the population. The sample of this research is all customers of Telkomsel, XL and Three as many as 100 respondents that already using the three providers. According to (heir et.al 2006) the minimum sample is 5 x item questionnaire. The sampling design is purposive sampling. Purposive sampling is sample selected in a deliberative and non-random fashion to achieve a certain goal.

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. Individuals provide information when interviewed, administered questionnaires, or observed. Group depth interviews, or focus groups, are another rich source of primary data. The primary data used in this research is questionnaire that will be distributed to respondents. Secondary data refer to information gathered by someone other than the researcher conducting the current study. The secondary data used in this research is taken from books, relevant literaturee and journals from library and internet.

Operational Definition of Research Variable

1. Consumer Purchase intention is the willingness of a customer to buy a certain product or a certain service.
2. Perceived usefulness
Usefulness refer to that a service satisfies a need or requirement. Before users choose a mobile network service, they would like to consider whether the service is useful to their work or study. It will influence consumers' attitude to use the mobile network services.
3. Perceived ease of use
Perceived ease of use in this research indicated that services demands a user friendly. Provider has the consumer so they feel the provider is not hard to use.
4. Price
Price in this research indicated that which is given up in an exchange to acquire a goods or service. Price is very important due to consumer purchase intention especially in selecting provider.
5. Enjoyment
Perceived enjoyment in this research indicated that the provider have a good internet service with the rarest internet service disruption. It is considered the consumer to choose a provider.
6. Speed and Coverage
Speed and coverage indicated that the provider provide high speed of internet and have the biggest networking coverage. This criteria also has a big contribution on consumer intention to choose provider.
7. Alternative
 - a. Telkomsel
 - b. XL
 - c. Three

Data Analysis Method

The Analytic Hierarchy Process (AHP) is due to Saaty (1980) and is often referred to, eponymously, as the Saaty method. It allows users to assess the relative weight of multiple criteria or multiple options against given criteria in an intuitive manner. In case quantitative ratings are not available, policy makers or assessors can still recognize whether one criterion is more important than another. Therefore, pairwise comparisons are appealing to users. Saaty established a consistent way of converting such pairwise comparisons (X is more important than Y) into a set of numbers representing

the relative priority of each of the criteria. The AHP generates a weight for each evaluation criterion according to the decision maker's pairwise comparisons of the criteria. The higher the weight, the more important the corresponding criterion.

Table 1. Rating Scale

Intensity of Important	Definition	Explanation
1	Equal importance	Two factors contribute equally to the objective
3	Somewhat more important	Experience and judgement slightly favour one over the other.
5	Much more important	Experience and judgement strongly favour one over the other.
7	Very much more important	Experience and judgement very strongly favour one over the other.
9	Absolutely more important	The evidence favouring one over the other is of the highest possible validity.
2,4,6,8	Intermediate values	When compromise is needed.

Source: Data Processed, 2016

Taylor (2013:445) mentioned a summary of the mathematical steps used to arrive at the AHP-recommended decision:

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.
 - e. Develop a pairwise comparison matrix for the criteria.
 - f. Compute the normalized matrix by dividing each value in each column of the matrix by the corresponding column sum.
 - g. Develop the preference vector by computing the row averages for the normalized matrix.
 - h. Compute an overall score for each decision alternative by multiplying the criteria preference vector (from step 5) by the criteria matrix (from step 2d).
 - i. Rank the decision alternatives, based on the magnitude on their scores computed in step 6.

RESULT AND DISCUSION

Result

Table 2. Result of Overall Criteria

Speed	Enjoyment	Ease of Use	Usefulness	Price
0.25	0.22	0.12	0.17	0.24

Sources: Data processed, 2016

The highest score is the speed (0.25). It means that price is the factor influence the most people that want to choose provider. The second highest influence shown by price (0.24), followed by enjoyment in third position (0.22), then usefulness followed in the fourth position (0,17) and ease of use as the lowest important criteria (0.12). The overall inconsistency 0.05. In general, the degree of consistency is satisfactory (acceptable) if overall inconsistency ≤ 0.10 . It means the data comparison in this result is valid and consistent.

Table 3. Result of AHP (Best Provider)

Telkomsel	XL	3
0.36	0.38	0.27

Sources: Data processed, 2016

Based on the observation, this research shows that respondents choose XL as the most preferred provider for them among the other alternatives. XL have the highest score with 0.38, followed by Telkomsel with score 0.36, and 3 in the last position with score 0.27. The overall inconsistency indicated = (0.03), In general, the degree of consistency is satisfactory (acceptable) if overall inconsistency ≤ 0.10 . It means that the data comparison in this result is valid and consistent.

Discussion

This research is designed to help the consumer decision making on internet service provider among three providers that are Telkomsel, XL and 3. The result obtained by using Analytical Hierarchy Process (AHP) as Multi-Criteria Decision Making (MCDM) method that helps decision maker to facing the complex options of alternative with various complex subjective criteria. This method is also useful to define the strength and weakness of each restaurant based on the criteria. Below is the discussion and explanation from the result of this research based on respondent's data. The respondents are people who have been used the three providers.

Pairwise Comparison for the Main Criteria Analysis

First position that influence criteria is price. The provider should have a proper price for the economic condition of customer, especially for young people because they want cheap product with the big impact. The respondents are those who have experienced on each alternative provided which are the three providers based on the requirement of using AHP method. So in this research, according to the respondents, price becomes the most preferred factor for the customer in selecting internet services in Manado. Speed becomes the second highest criteria that influence people intention on internet services. Speed becomes one of the important things to consider which provider that they want. When customers want to choose provider, they want the fastest provider. Most customers of provider are students who very active in social media wherever they go. So, the provider should give a good speed in every place for the customers. Third position that influence criteria is enjoyment. The provider that has big coverage connection will make customers enjoy. And also the provider with the least breakdown can influence the customer's enjoyment. With the factors above, when the customers feels very enjoy with the provider then they will used it for a long period.

Fourth position that influence criteria is usefulness. It is important for a provider to fulfill the customer needs for their job. Most customer of provider are students who active in social media and has many assignment from lecturer. So if the provider can give a good offer that related with customers daily activity then they can attract customer's intent to choose a provider.

The last place is ease of use. Perceived ease of use is less important to customer because they take price and speed on priority, ease of use does not really important because generally most of the provider is easy to use and even there is any problem the customer can find the way out to use it.

Pairwise Comparison Criteria within Three Provider Alternatives Analysis

Pairwise comparison criteria within three provider alternatives show each firm performance on each criteria developed on Analytical hierarchy Process (AHP). From the result of price, 3 has strength in the criteria because price of the data package that they offers to the consumer is very cheap than the others two.

In usefulness criteria, Telkomsel became has strength in the criteria because telkomsel is the oldest provider in manado city and many people usually use telkomsel to communicate through phone call. In ease of use criteria, telkomsel became the most preferred by respondents. For the customers, telkomsel is easy to use because they offers the customer the data package that easy to understand and they made an application called "mytelkomsel" to make the customer easier to search information.

Next criterion is Enjoyment. In this result the most preferred is goes to Telkomsel. In terms of enjoyment, the provider gives the best performance in order to service the customer. They always upgrade the connection so it became rarer to breakdown.

At criteria of speed, the result shows that XL is the most preferred by customers. It is because XL always prioritize about the speed of the connection. In manado XL 4G speed is 11Mb/s while talkomsel 9,5Mb/s using speedtest.net.

Result of Analytical Hierarchy Process of Consumer Preferred Provider

Based on the overall data, customer will choose XL the most preferred provider in Manado compared to the other alternatives. The result shows that when people want to use 4G provider, they prefer to choose XL as the most preferred 4G provider among the other alternatives. XL has the highest score, in the second position is Telkomsel, and followed by 3 in the last position.

CONCLUSION AND RECOMMENDATION

Conclusions

1. Based on five criteria (restaurant price, usefulness, ease of use, enjoyment and speed), there are top three criteria that have the most influence to attract customer on 3G & 4G services in Manado. In the first place and got the highest total score 0.27 goes to price. According to the data comparison that developed in pairwise comparison of Analytical Hierarchy Process (AHP), price became the preferred criteria for customer when selecting 3G & 4G services. Second position of the highest score goes to speed with total scores 0.25, and then enjoyment come in third place with total score 0.19.
2. Based on the overall result that developed using Analytical Hierarchy Process (AHP), shows that XL become the most preferred 3G & 4G internet services by the customers with score (0.39), in the second position is Telkomsel with score (0.32), and 3 in the last position with score (0.29).

Recommendations

The result of this research recommends restaurant management to be concerned more on two of these criteria below:

1. Speed is the most important role in attract customer to buy internet services. In this case, XL have the fastest speed internet connection compare to Telkomsel and 3. Telkomsel and 3 should know who are the most customers. Based on the data, the most customers of internet services are students who very active in social media wherever they go. So, the provider should give a good speed in every place for the customers.
2. Price has also important criteria for the customer. By respondents, price became the second important thing to consider which internet services they want to choose. Based on the data, 3 became the provider with the cheapest price. So it is important for the provider to have more attention towards the price because economic condition is matter. Before they ask about the provider advantage they will check if the internet services price is fit with their money.

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