

**THE ANALYTICAL HIERARCHY PROCESS (AHP) ON PURCHASE EVALUATION OF LOW END SMARTPHONE IN MANADO (CASE STUDY : OPPO, ASUS AND ADVAN)**

*ANALISIS HIRARKI PROSES DALAM EVALUASI PEMBELIAN PADA SMARTPHONE KELAS BAWAH DI MANADO ( STUDI KASUS : OPPO, ASUS DAN ADVAN)*

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**Abstract:** Smartphones is a sophisticated mobile phones that resemble computers to meet human needs as a communications tool. Consumer purchasing decisions are a process that involves individuals or groups in choosing, purchasing, using or disposing of products, services or experiences to meet their needs. In understanding decision making we will know how consumers make a decision from searching to buy products or services and also we can know the factors that influence decision making. This research uses kuantitatif method to measure data. The method used is Analytical Hierarchy Process method. The AHP method for rating alternative decisions and selecting the best multiple criteria is given, allowing users to assess the relative weights of some criteria given intuitively. Customer will choose Oppo as the most preferred low end smartphone in Manado compared to the other alternatives. The result shows people want to choose the best low end smartphone, they prefer to choose Oppo smartphone among the other alternatives. User interface is the most important criteria for the consumer. The user interface of the low end smartphone much important as the criteria in purchase evaluation because every consumer need their low end smartphone to be able to interact directly.

**Keywords :** *customer decision making, analytical hierarchy process*

**Abstrak:** *Smartphone adalah telephone genggam canggih yang menyerupai computer untuk memenuhi kebutuhan manusia sebagai alat bantu komunikasi. Keputusan pembelian konsumen adalah suatu proses yang melibatkan individu atau kelompok dalam memilih, membeli, menggunakan atau membuang produk, layanan atau pengalaman untuk memenuhi kebutuhan mereka. Dalam memahami pengambilan keputusan kita akan mengetahui bagaimana konsumen mengambil suatu keputusan dari mencari sampai membeli produk atau jasa dan juga kita dapat mengetahui faktor yang mempengaruhi pengambilan keputusan. Penelitian ini menggunakan metode kuantitatif untuk mengukur data. Metode yang digunakan adalah metode Analytical Hierarchy Process. Metode AHP untuk peringkat alternative keputusan dan memilih yang terbaik beberapa kriteria yang diberikan, memungkinkan pengguna untuk menilai bobot relative dari beberapa kriteria yang diberikan secara intuitif. Pelanggan akan memilih Oppo sebagai smartphone low end yang paling disukai di Manado dibandingkan dengan alternatif lain. Hasilnya menunjukkan orang ingin memilih smartphone low end terbaik, mereka lebih memilih untuk memilih smartphone Oppo di antara alternative lain. Antarmuka pengguna adalah kriteria paling penting bagi konsumen. Antarmuka pengguna dari smartphone low end sangat penting sebagai kriteria dalam evaluasi pembelian karena setiap konsumen membutuhkan smartphone low end mereka untuk dapat berinteraksi secara langsung.*

**Kata Kunci:** *keputusan pembeli, analisis hirarki proses*

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## INTRODUCTION

### Research Background

Communication is very important for human interactions. To establish relationship with other, humans can communicate with a variety of ways through word of mouth, body language or gestures to convey something of information is the purpose of us and that is what is meant by direct communication. Now with smartphones easier to establish communication with the people around us and also with people who have different distances with our time. Various benefits that find when use a smartphone in this day. In the country of Indonesia is currently a lot of people are using the power of a smartphone. Based on the need of consumers, the smartphone can manufacture a plan strategy development to satisfy consumer desires. In such circumstances, the evaluation could smartphone regarded as a consumer issue in the decision to buy the best smartphone as desired.

Low end products are products with limited creativity and have a price that can be reached but also have good quality. Products that are said to be low end in developed countries can be an advanced product in developing countries. Low end product has a target market in all classes of society to buy the product. Low end smartphone is the smartphone with the lower techno but has a good quality, lower creativity and have an affordable price. As the demand smartphone Indonesia increase that's why company lowering the price. Low income product and call smartphone low end.

Low end smartphones now have mushroomed Indonesia. Companies are now creating good quality and affordable price that is destined also not only for some circles but also low end smartphones for all circles, there are also among the upper class who want a smartphone with a cheap price but that Has a very good quality. Low end Smartphone in Indonesia is priced starting from 1,000,000idr - 2.000.000idr. And in Indonesia there are many categories of low end smartphones that have good quality. Purchase Evaluation is a systematic determination of the advantages, values and significance of a subject, using criteria set by a standard set. to assist decision-making.

Purchase Evaluation is a systematic determination of the advantages, values and significance of a subject, using criteria set by a standard set. It can help organizations, programs, projects or other interventions or initiatives to assess objectives, concepts or proposals that can be realized, or alternatively, to assist decision-making; Or to find out the level of achievement or value with respect to the objectives and objectives and outcomes of the completed action. The main purpose of the evaluation, in addition to gaining insight into previous or existing initiatives, is to enable reflection and assist in the identification of future changes.

Consumer evaluation can be seen as a different stage. Alternatively, evaluation can occur continuously throughout the entire decision process. The fact that consumers are aware of a brand does not mean that it is considered a potential purchase.

This priority is directly related to the needs and desires of consumers based on the criteria.with the criteria's that can influence consumer to choose a smartphone and try to find which smartphone that meet the customers expectation the most and which criteria has influence the most people to selecting a smartphone. With purchase evaluation can certainly help consumers who buy or want to buy a smartphone at an affordable price in the city of Manado. Consumers can evaluate what the benefits of buying a smartphone at an affordable price that certainly does not harm the prospective consumers.

The purpose of this research in order to assist consumers in Manado in the decision to buy a smartphone with a good quality, modern design and an affordable price. Based on the above description.

### Research Objectives

Based on the research problem the objective of this research are:

- 1.Criteria has influence the most in selecting a smartphone.
- 2.Smartphone people choose the most.

## THEORITICAL FRAMEWORK

### Marketing

Every human being has the opportunity to engage in marketing activities whether it is buying an item, using a service, marketing or promoting an item that is part of a marketing activity. According to Kotler (2012) marketing is are human activity directed to meet the needs and desires through the exchange process. Kotler and

Armstrong (2012 : 28) define marketing as a social and managerial process that allows individuals and groups to get what they need and want through the creation and exchange of mutual products and value with others.

According to Stanton, Etzel and Djaslim (2001) marketing is an overall system of business activities aimed at planning, pricing, promoting and distributing goods and services that satisfy both buyers and potential buyers. The goal is to know and understand the customer in such a way that the products sold will match in accordance with the wishes of customers, so that the product can be sold by itself.

### **Consumer Decision Making Process**

The consumer or buyer decision making process is the method used by marketers to identify and track the decision making process of a customer journey from start to finish. Consumer decision making process according to Kotler and Keller (2009) comprises five stages: need recognition is the first stage of consumer decision making process and it can be explained as result of an imbalance between actual and desired needs. The field of consumer decision making process cover a lot of ground; it is study of the process involved when the individual or group make decision to purchase, use, or dispose of product service to satisfy need and desires. In the literature on decision making, the decision-making style and in particular the tendency to maximize or satisfice the decision has been found to have a direct impact on the decision process and can explain diversities in decision-making behaviour.

In its early stages of development researcher refer to field as buyer decision. This reflected an emphasis on the interaction between consumers and procedure at the time when consumer made decision to buy or use some product or service. Consumer decision making process is very important for determine what the consumer need of product and service so as to satisfy consumer needs and desires.

### **Purchase Evaluation**

Purchase Evaluation is the consumer decision process does not end once the product or service has been purchased (Kotler, 1997). After using a product or service the consumer compares the level of performance with expectations. Satisfaction occurs when the consumer's expectations are either met or exceeded, while dissatisfaction results when performance is below expectations.

Another possible outcome of purchase is cognitive dissonance which refers to a feeling of psychological tension or post-purchase doubt a consumer may experience after making a difficult purchase choice. Consumers often look to advertising for supportive information regarding the choice they have made.

After evaluating different product attributes, consumers rank each attribute from the most important to the most important. This priority is directly related to the needs and desires of consumers.

### **User Interface**

The user interface everything that the user can see and interact with others in the industrial design field of human-computer interaction, the space where interactions between humans and machines occur.

### **Mobile Commerce Function**

Mobile commerce is the simplest way to describe mobile commerce would be the buying and selling of products – or the conduct of commercial transactions and activities – through telecommunication and other mobile devices that run or operate on wireless network technologies.

### **Software and Hardware**

A software requirements specification (SRS) is basically an organization's understanding of a customer or potential client's system requirements and dependencies at a particular point in time usually prior to any actual design or development work (Donn Le Vie Jr, 2010).

### **Entertainment Function**

Entertainment function makes smartphone users entertained according to the level of desire in the user's own user. In all smartphones not least the low end smartphone entertainment function is very attractive consumers evaluate before buying low end smartphone to get low end smartphone with entertainment function desired by consumers.

### **Appereances and Design**

Innovation with a style of charisma is key in today's smart phone industry. The elegant design of the lower class smartphone is able to attract many consumers to buy low end smartphone products.

### **Low End Smartphone**

The greatest challenge for the electronics manufacturer will be to load up the powerful technologies while keeping the prices of the phones low enough to stay competitive (Horia, 2015). Maintaining the right balance between cost and features might secure the success of future devices.

Low end smartphone is a smartphone with low quality, with a design or a simple and has limited hardware and software, and has a price that can be reached or a cheap price. Low end smartphones have a low creativity compared to mid smartphone and higher smartphones Ahmad et al. Low end smartphones can compete in the market because low end smartphones are also sought everyday by the people who want smartphone. Low end smartphone companies are also beginning to launch innovations for their products in order to attract other smartphone users by making some powerful devices better for low end users can feel the same thing on middle or higher smartphones

### **Previous Research**

Hu. and Liao, (2013), is to understand the importance of factors affecting consumers' preferences related to smartphones. In order to propose the most reasonable aspects and criteria, combine literature surveys and the experiences of related telecommunication experts to build five aspects and twenty criteria to evaluate the purchase factors of consumers. The respondents are comprised of the teachers and the graduate students of two universities in Taiwan. The data had been analyzed by using AHP (analytical hierarchy process). And result of this research show that they can learn consumers' chief considerations through AHP evaluation model.

Chen, et al (2010), To develop an effective recommendation system, at first identify the key product attributes that consumers use to select and purchase their mobile phones. This study was using study illuminates the feasibility of using the AHP technique to support consumers' online mobile phone selections. Selection is by integrating data mining and AHP techniques. Second the transformation of qualitative attributes to quantitative measures represents a limitation of our AHP implementation.

Tochukwu (2014), help marketers not only to understand consumers need to purchase smartphone but also to more competitive advantages. Regarding to the research findings, the answers from the questionnaires of this research paper and based on the researcher's observation.

## **RESEARCH METHOD**

### **Type of Research**

This research use quantitative method. Quantitative research seek to quantify the data. It seeks conclusive evidence based on large, representative samples and typically involving some from of statistical analysis (Maholtra, 2009).

### **Place and Time of Research**

This research is conduct in Manado city and it will be held from July to August 2017.

## Conceptual Framework

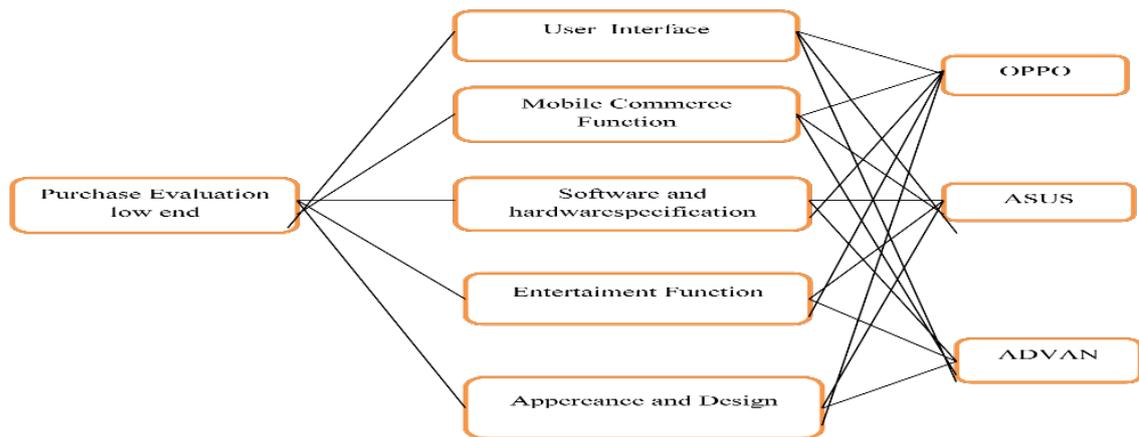


Figure 1 Conceptual Framework

### 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 (2010), The population for this research is the people who consume smartphone in Manado city. The population for this research is the people who consume smartphone in Manado city. The sample of this research is all consumer low end smartphone purchase evaluation of Oppo, Asus and Advan as many as respondents 30 respondent that have experience of purchase evaluation.

In all form of research, it would be ideal to test the entire population, but most cases the population is too large that is imposible to include every individual. This is reason why the most researcher rely on sampling techniques.

### Data Collection Method

The 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). Individual provide information when interviewed, questionnaires or observation. Used in this research is questionnaire that will be distributed to respondents in Manado. Secondary data refer to information gathered than the researcher conducting the current study Sekaran and Bougie (2009) this research were used in the research is taken from books, relevant, literatures and journal from library and internet. Secondary data in this research were used in the research background, literature review and research methodology.

### Data Analysis Method

Analytical hierarchy process is especially suitable for complex decision which involves the comparison of decision elements. According to Taylor (2013) The Analytical Hierarchy Process (AHP), develop by Thomas Saaty, is a method for ranking decision alternatives and selecting the best one given multiple criteria. This research use the Analytical Hierarchy Process (AHP) is due to Saaty (1980) and is often reffered to, eponymously, as the Saaty method. It allows users to asses the relative weight of multiple criteria or multiple option against given criteria in an intuitive manner. In case quantitative ratings are not availability, policy makers or assessors can still recognize wheter one criteria is more important than another. Therefore pairwise comparisons are appealing to users. Saaty (1990) ethablished 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 criteria according to the decision maker's pairwise comparison of criteria. The higher the weight. The more important the corresponding criteria.

**Table 1. Rating Scale**

Intensity of	Definition	Explanation
<b>Important</b>		
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: Saaty Rating Scale (2008)

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

## RESULT AND DISCUSSION

### Result

**Table 2. Result of Overall Criteria**

Apperean ces	Entertai ment	Software hardware	Mobile commerce	User interface
0.07	0.13	0.18	0.21	0.40

The highest score is low end smartphone user interface (0.40). User interface is the factor that influence the most people to purchase the best low end smartphone. The second highest influence shown by mobile commerce (0.21), followed by software and hardware specification in third position (0.20), then entertainment function followed in the fourth position (0,13) and location as the lowest important criteria (0.7). The overall inconsistency 0.07. 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 (Purchase Evaluation Low End Smartphone)**

Advan	Asus	Oppo
0.21	0.32	0.47

*Sources: Data processed, 2017*

Based on the observation, this research shows that respondents choose the low end smartphone the most selecting for them among the other alternatives. Oppo low end smartphone have the highest score with 0.47, followed by Asus low end smartphone with score 0.32, and Advan low end smartphone in the last position with score 0.21. The overall inconsistency indicated = (0.08), In general, the degree of consistency is satisfactory (acceptable) if overall inconsistency  $\leq$  0.10. It means that the data comparison in this result is valid and consistent.

### Discussion

This research is evaluate to find out the consumer purchase low end smartphone in Manado city selection among three Smartphones that are Oppo, Asus and Advan. 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 smartphone 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 experience of purchase evaluation three low end smartphone.

### Pairwise Comparison for the Main Criteria Analysis

Firstly, for the overall of five main criteria (user interface, mobile commerce function, software and hardware specification, entertainment function, appereances and design), based on the most important criterion that influences customer is user interface.

First position that influence criteria is user interface. The low end smartphone concept of user interfaces include the interactive aspects of computer operating systems, hand tools, heavy machinery operator controls, and process controls.whilst the machine simultaneously feeds back information that aids the operators' decision-making process. The user interface of the low end smartphone much important as the criteria in purchase evaluation because every consumer need their low end smartphone to be able to interact directly.

The respondents are those who have experienced on each alternative provided which are the three low end smartphone based on the requirement of using AHP method. So in this research, according to the respondents, low end smartphone user interface becomes the most preferred factor for the customer in purchasing low end smartphone in Manado.

Mobile commerce function becomes the second highest criteria that influence people want to choose low end smartphone. Mobile commerce becomes one of the important thing to selecting the customer want to purchase. When customers wants to choose the low smartphone, they choose the mobile commerce function. Consumers the low end smartphone are students. So, mobile commerce function makes low end smartphone applications to be able to operate mobile commerce systems that cater to consumers who are happy with low-end smartphones selling items using low end devices.

Third position that influence criteria is software and hardware specification. Software and hardware low end smartphone smartphone software and hardware very important to support the sophistication of a new smartphone that can attract consumers evaluate choose the smartphone. Because include a set of use cases that describe user interactions that the software must provide performance.

Fourth position that influence criteria is entertainment function. It is important for the low smartphone to entertain consumer, because the consumer is not only choosing the low smartphone for low price but also to entertain them. makes smartphone users entertained according to the level of desire in the user's own user to get low end smartphone with entertainment function desired by consumers.

And the last appereances and design. less important to consumer because they take user interface and mobile commerce function on priority, appereances and design does not really important because somehow people does not take it as problem whether the low end smartphone new design or not to purchasing but it is because people are attracted ore on what they put as priority criteria low end smartphone.

### **Pairwise Comparison Criteria Within Three Low End Smartphone Alternatives Analysis**

Pairwise comparison criteria within three low end smartphone alternatives show each firm performance on each criteria developed on Analytical hierarchy Process (AHP). From the result the user interface, Oppo low end smartphone has strength in the criteria because Oppo smartphone of low end smartphone are superior in the criteria of low end smartphone. User interface which makes it easy (self-explanatory), efficient, and enjoyable (user-friendly) to operate a machine in the way which produces the desired result. The smartphone also provides user interface criteria to influence consumers. User interface and oppo low end smartphone number is obvious Because With this advantage, this smartphone also bears the title of selfie smartphone expert for consumer interaction. Compared to the other two.

Next criterion is Mobile commerce function. In this result the most preferred is Oppo. In terms of mobile commerce, the smartphone gives the best mobile commerce to consumer. In consumer oppo mobile commerce function it is easier to sell or buy items using devices from low end smartphone oppo Low end smartphone Oppo set up a high competitiveness for this criterion to be followed by the other two low end smartphone.

The software and hardware available on low end oppo smartphones make computer users because their data storage devices are larger than the other two. Entertainment function Oppo is able to attract the attention of consumers with good consequences on consumers who are entertained with creativity that can not be answered with the available functions .At criteria of appereances and design, the result shows that Oppo smartphone is the most preferred by customers. It is because Oppo which appereances and design Innovation with a style of charisma is key in today's smart phone industry. The elegant look of low end smartphone oppo to attract other low end smartphone enthusiasts to prefer oppo smartphones. In every criterion, Asus not being the most prefer low smartphone. It is because Asus criteria.

Consumer prefer choose low end smartphone that have good criteria from the overall criteria low smartphone. The second reason for consumer the low end smartphone to choose the best low smartphone not a Asus smartphone.

### **Result of Analytical Hierarchy Process of Consumer Preferred Low End Smartphone**

Based on the overall data, customer will choose Oppo as the most preferred low end smartphone in Manado compared to the other alternatives. The result shows people want to choose the best low end smartphone, they prefer to choose Oppo smartphone among the other alternatives. Oppo has the highest score, in the second position is Advan smartphone, and followed Asus in the last position.

## **CONCLUSION AND RECOMMENDATION**

### **Conclusions**

1. Based on five criteria (user interface, mobile commerce function, software and hardware specification, entertainment function, appereances and design), there are top three criteria that have the most influence for customer in selecting cinema particularly in Manado. In the first place and got the highest goes to user interface. According to the data comparison that developed in pairwise comparison of Analytical Hierarchy Process (AHP), low end smartphone user interface became the preferred criteria for consumer when selecting purchase low end smartphone. Second position of the highest goes to mobile commerce, and then software and hardware specification criteria come in third place.
2. Based on the overall result that developed using Analytical Hierarchy Process (AHP), shows that Oppo low end smartphone become the most preferred by the customers with score (0.47), in the second position is

Advan low smartphone with score (0.32), and Asus low end smartphone in the last position with score (0.21).

### Recommendations.

User interface is the most important criteria for the consumer. The user interface of the low end smartphone much important as the criteria in purchase evaluation because every consumer need their low end smartphone to be able to interact directly. Based on the data, Oppo Low end smartphone became the low smartphone with the best low smartphone user interface. So it is important for the low end smartphone to have more attention towards the user interface because the main interst.. Before the consumer see the other criteria, enjoy the service, quality of product and feel the experience.

Mobile commerce function also has important role in selecting the low end smartphone. By respondents, mobile commerce function became the second important thing to consider which low smartphone they selecting to choose. In this case, Oppo smartphone have the most affordable mobile commerce compare to Advan low end smartphone and Asus. Advan and Asus should know who are the most customers. Based on the data, the most customers have income < Rp 1.000.000. So, Advan smartphone and Asus should give more quality of mobile commerce function.

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