Application Of Analytical Hierarchy Process (Ahp) Method In Purchasing Decision Support Systems For Clothing Products Through Online Stores; Study Of Students In The City Of Bekasi, West Java

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Abstract

This research aims to determine the dominant factors that influence student decisions in shopping for clothing products online; in this case the focus is on student shopping behavior in Bekasi City. This is a Quantitative Research, with the Analytical Hierarchy Process (AHP) approach for data processing. The research was conducted in two stages.The first stage respondents were asked to name the 4 most popular online stores,with; Bukalapak, Tokopedia, Shopee and Lazada are the results.This will then be an alternative choice.In the second stage, there were 93 students in Bekasi City who were assessed based on the criteria that they had made transactions through the four online shops, with assessment aspects; the appeal of the web display, the reputation of the online store, the completeness of information and the ease of transactions.As a result showed that Tokopedia is an online shop that has a high core compared to the others.Its strength is web design and this greatly influences the desire of students to shop at the Online Store. Whereas Bukalapak is considered capable of providing sufficient information and already has a good reputation compared to others. Important factors that also affect include ease of transaction.

Keywords : Analytical Hierarchy Prosess (AHP), Clothing products, Online Shop, Bekasi-Indonesia

Introduction

In this digital age, online shopping has become a necessity, not only for buyers but also for traders. With a population of more than 200 million, Indonesia is a large country and is often referred to as a digital potential market. Because, until now there have been around 88.1 million active internet users in Indonesia, it is also expected to continue to grow. Based on existing data, the increase in internet users in Indonesia during the year from January 2015 to January 2016 was around 15 percent (Solekhan and Winarso, 2016).

These two main market players complement each other and form a new shopping style revolution that is efficient, easy and safe even though they have never met physically. The transformation of information technology has made Indonesia one of the countries with very high e-commerce growth. The results of a survey on ICT Indicators research by the Ministry of Communication and Information Technology Human Resources Agency in 2016 noted that as many as 24.2% of internet users in Indonesia or around 19.5 million people in Indonesia carry out e-commerce activities (Kominfo, 2016)

The internet has changed the way humans look in the last 10 years, especially in the business world. All business activities cannot be separated from the role of the internet, starting from looking for business ideas, recruiting employees, how to produce, how to sell, to making transactions. Various studies have been conducted related to factors that lead to the adoption and use of the internet in general and for business purposes in particular (Chang et al., 2005). Meanwhile, based on the results of a survey conducted by PANDI in 2016, as many as 130.8 million Indonesians knew that the internet was a means of buying and selling goods & services with 84.2 million residents having conducted online transactions. With such a high amount, of course Indonesia becomes a big land to develop e-commerce and digital application business (Kominfo, 2016; APJII, 2016).

The rapid growth of information technology has created new business opportunities in the pursuit of business success. Internet technology, has made businesses today become borderless and timeless (without territorial boundaries and without time limits). According to Nucifora's (2000) research,

business turnover in 2003 was estimated at around 3.2 trillion dollars, while according to Ali and Satria (2018), global online sales in 2011 had recorded 763 trillion dollars. With more than 2.4 billion users in 2012 media, this shows that the use of the internet as a business infrastructure is very promising.

Meanwhile, Indonesia is also one of the countries experiencing a booming user on the internet. If in 1998, internet users only recorded around 500 thousand, at the beginning of the decade of the 21st century there was a fairly high surge of around 61 million internet users (Karimuddin, 2012). The number of internet users has placed Indonesia as the fourth largest country accessing the internet.

Online shopping is very popular with teenagers. Internet usage preferences with adolescent segmentation are generally more social interaction and pleasure, with dominance at the lowest income level. In addition the youth segment tends to have high internet expertise and spend more time on the internet (23.3 hours per week) (Hijrah, 2017).

The factors that influence a person making a purchase vary greatly (Hijrah, 2017). Adi (2013) mentions the attractiveness of posting messages and reputation, influencing one's interest in making online purchases. While Shim, Shin, & Nottingham (2002) explain that online buyer behavior is highly dependent on the availability of information and the ease of conducting online transactions. This attitude will later lead to a person's decision to make an online purchase.

Based on this background it is important to know what factors are dominant in influencing teenagers' decisions in shopping for clothes online; in this case the study focused on student spending behavior in Bekasi. Based on the elaboration of the results of previous studies, the dimensions used in formulating factors that influence adolescent decisions in shopping online are: attractiveness of the web appearance, online store reputation, completeness of information and ease of transaction.

Methodology

This is a Quantitative Research, using objective data and statistical measurements through scientific calculations derived from community samples by providing answers to a number of questions as outlined in the questionnaire using the Analytical Hierarchy Process (AHP) approach.

The study was conducted in two stages, the first stage respondents were asked to name the 4 most popular online stores. From this first step, we get 4 of the most popular online store names, namely; Bukalapak, Tokopedia, Shopee and Lazada. These four online stores will then become alternative choices. In the second stage, the number of 93 students in Bekasi City was assessed with the criteria that they had made transactions through the four online shops. While the attractiveness of web appearance, online store reputation, completeness of information and ease of transaction are criteria in determining shopping decisions (Widiyanto and Prasilowati, 2015).

Result And Discussion

Analytical hierarchy procedure (AHP) was proposed by Saaty. AHP was originally applied to the problem of uncertain decisions with several criteria, and has been widely used in solving problems of ranking, selection, evaluation, optimization, and predictive decisions. The AHP method is expressed by a unidirectional hierarchical relationship among decision levels (Amari, 2013).

Criteria Explanation

    A. Criteria in the decision making are :
        1) Web design   (X1)
        2) Reputation   (X2)
        3) Product information   (X3)
        4) Transaction   (X4)
    B. Online store alternative are:
        1) Bukalapak   (Y1)
        2) Tokopedia   (Y2)
         3) Shopee   (Y3)
        4) Lazada   (Y4)

The first step in the AHP model is to calculate the hierarchical weighting factor for all criteria based on recapitulation of the questionnaire results using the paired comparison method, where the lower triangle matrix results from the comparison of the upper triangle matrix. The results of the calculation

produce anEigen Vector value which then as a multiplier of the total value of each criterion to produce the maximum Eigenvalue (maximum λ). Table 1 contains the results of the Eigen Vector of all the criteria in the study.

Tabel 1. Paired comparison table to the criteria

	X1	X2	X3	X4	Normalization	X1	X2	X3	X4	Σ	Eigen Vector
X1	1,000	3,000	5,000	7,000		0,597	0,621	0,588	0,538	2,344	0,587
X2	0,333	1,000	2,000	3,000		0,199	0,207	0,235	0,231	0,872	0,218
X3	0,200	0,500	1,000	2,000		0,199	0,103	0,118	0,154	0,494	0,123
X4	0,142	0,333	0,500	1,000		0,085	0,069	0,059	0,077	0,289	0,072
Σ	1,675	4,833	8,500	13,000							

Source: Data processed, 2019

The next step is to calculate the evaluation factors for each of the criteria in Table 1, explaining about web design, table 2 about the reputation of online stores, table 3 completeness of product information sold, and table 4 about the ease of transaction of each online store.

Tabel 2. Paired comparison table to the options according to Web desain

	Y1	Y2	Y3	Y4	Normalization	Y1	Y2	Y3	Y4	Σ	Eigen Vector
Y1	1,000	0,333	0,333	2,000		0,133	0,143	0,087	0,286	0,649	0,162
Y2	3,000	1,000	2,000	2,000		0,400	0,429	0,522	0,286	1,636	0,409
Y3	3,000	0,500	1,000	2,000		0,400	0,214	0,261	0,286	1,161	0,290
Y4	0,500	0,500	0,500	1,000		0,067	0,214	0,130	0,143	0,554	0,139
Σ	7,500	2,333	3,833	7,000							

$\propto max = 4,253$

$CI = 0,084$

$CR = 0,094$ ($CR < 0,100$ means the respondent's preference is consistent)

Source: Data processed, 2019

Table 3. Paired comparison table to the options according to reputation

	Y1	Y2	Y3	Y4	Normalization	Y1	Y2	Y3	Y4	Σ	Eigen Vector
Y1	1,000	2,000	5,000	5,000		0,526	0,533	0,385	0,600	2,044	0,511
Y2	0,500	1,000	4,000	2,000		0,263	0,267	0,308	0,240	1,078	0,269
Y3	0,200	0,250	1,000	0,333		0,105	0,067	0,077	0,040	0,289	0,072
Y4	0,200	0,500	3,000	1,000		0,105	0,133	0,231	0,120	0,589	0,147
Σ	1,900	3,750	13,00	8,333							

$\propto max = 4,148$

$CI = 0,049$

$CR = 0,055$ ($CR < 0,100$ means the respondent's preference is consistent)

Source: Data processed, 2019

Table 4. Paired comparison table to the options according to product information

	Y1	Y2	Y3	Y4	Normalization	Y1	Y2	Y3	Y4	Σ	Eigen Vector
Y1	1,000	5,000	5,000	7,000		0,648	0,732	0,600	0,500	2,480	0,620
Y2	0,200	1,000	2,000	3,000		0,130	0,146	0,240	0,214	0,730	0,183
Y3	0,200	0,500	1,000	3,000		0,130	0,073	0,120	0,214	0,537	0,134
Y4	0,143	0,333	0,333	1,000		0,093	0,049	0,040	0,071	0,253	0,063

∑	1,543	6,833	8,333	14,000	
∝ max = 4,208					
CI = 0,069					
CR = 0,077 (CR < 0,100 means the respondent's preference is consistent)					

Source: Data processed, 2019

Table 5. Paired comparison table to the options according to transaction

	Y1	Y2	Y3	Y4	Normalization	Y1	Y2	Y3	Y4	∑	Eigen Vector
Y1	1,000	2,000	2,000	0,333		0,200	0,200	0,308	0,179	0,886	0,222
Y2	0,500	1,000	0,500	0,200		0,100	0,100	0,077	0,107	0,384	0,096
Y3	0,500	2,000	1,000	0,333		0,100	0,200	0,154	0,179	0,632	0,158
Y4	3,000	5,000	3,000	1,000		0,600	0,500	0,462	0,536	2,097	0,524
∑	5,000	10,000	6,500	1,876							
∝ max = 4,074											
CI = 0,025											
CR = 0,028 (CR < 0,100 means the respondent's preference is consistent)											

Source: Data processed, 2019

Table 6. Matrix of Relationships between Criteria and Alternatives

	Eigen Vector			
	X1	X2	X3	X4
Y1	0,162	0,511	0,620	0,222
Y2	0,409	0,269	0,183	0,096
Y3	0,290	0,072	0,134	0,158
Y4	0,139	0,147	0,063	0,524

Resource : Data processed, 2019

The next step is to find the total ranking for each online store by multiplying the evaluation factors of each alternative by the weight factor, resulting in the value in table 7 below,

Table 7. The weight matrix of options according to the criteriatable

	Bukalapak	Tokopedia	Shopee	Lazada
X1	0,095	0,240	0,170	0,082
X2	0,111	0,059	0,016	0,032
X3	0,076	0,023	0,016	0,008
X4	0,016	0,007	0,011	0,038
Total	0,299	0,328	0,214	0,159

Resource : Data processed, 2019

From the results of Table 7 it can be concluded that the order of priority shopping at online stores is based on communal considerations (all criteria) with the AHP method in sequence, Tokopedia (32.8%), Bukalapak (29.9%), Shopee (21.4%), and Lazada (15.9%). In addition, it can also be seen the total ranking of each online store and the priority order as shown in table 8,

Table 8. Ranking toko online berdasarkan kriteria

Ranking of priority	Web Desain	Reputation	Information	Transaction
1	Tokopedia	Bukalapak	Bukalapak	Lazada
2	Shopee	Tokopedia	Tokopedia	Bukalapak
3	Bukalapak	Lazada	Shopee	Shopee
4	Lazada	Shopee	Lazada	Tokopedia

Resource : Data processed, 2019

Conclusion

The city of Bekasi has developed into a Metropolitan, and this has an effect on people's life patterns which have begun to shift to hedonic and consumerist patterns. Based on pre-reserch data, four Online Stores were found to be the most popular by students, namely: Tokopedia, Bukalapak, Shopee and Lazada. Based on the results of the study showed that Tokopedia is an online shop that has quite a high core compared to the others, then the second place is Bukalapak, Shopee, and finally Lazada. The strength of Tokopedia is on web design. And this is very significant in influencing students to want to shop at the Online Store. On the other hand Bukalapak is considered capable of providing sufficient information and already has a good reputation compared to the other three Online Stores. Ease of transactions is one of the important factors that can affect the community. The payment system applied by Lazada provides enough convenience in making transactions. Thus the need to develop marketing intelligence that can provide new innovations that have been given above by competitors.

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