
JURNAL MANAJEMEN DAN BISNIS INDONESIA

Volume 2, Nomor 1, Oktober 2014

FMI
FORUM MANAJEMEN
INDONESIA

JURNAL MANAJEMEN DAN BISNIS INDONESIA	VOL.2	NO.1	HAL.1-153	OKTOBER 2014	ISSN 2338-4557
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Mapping of Tablet PC Based On Consumer Perception
(Case Study of Bandung Electronic Center Visitors)
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ABSTRACT

Gadget development is becoming a phenomenon which attract the world's attention today. Sophisticated telecommunications technology encourages the creation of new gadget especially Tablet PC. More and more people using this gadget to replace their computer use. The purpose of this study was to map the position of several Tablet PC brands such as Apple, Samsung, Smartfren, Acer, and ASUS based on the perception of Bandung Electronic Center (BEC) visitors. Each day, around 25.000-40.000 visitors visit the BEC which is the largest electronic mall in Bandung.

This is an exploratory reseach using the descriptive method. Multidimensional scaling technique used to mapped the 5 Tablet PC brands into six dimensions; product feature, brand, price, battery consumption (endurance), lifestyle and design. The questionnaires were delivered to 100 respondents using purposive sampling method.

The results of this study indicated that Apple is still the best for product feature based on consumer perceptions . As for the best brand the winner is Samsung followed by Apple, ASUS, Acer and Smartfren. Based on price dimension the cheapest Tablet PC is Smartfren and Apple is the most expensive. Samsung is also the winner in the field of battery power consumption and Acer is the worst. The best Tablet PC in the field of the lifestyle is Samsung followed by Apple, ASUS, Acer and Smartfren. Finally, Tablet PC with the best design also goes to Samsung then followed by Apple, ASUS, Acer and Smartfren.

Keywords: Consumer Perseption,, Positioning, Multidimensional Scaling Technique, Tablet PC

Introduction

Trend in using the gadget intensify the mobile internet adoption in Indonesia. The use of Internet is not just become a way of life, but a necessity which integrated into every activity. The

availability and the affordable price of the gadget change human patterns and lifestyle. Gadgets make user easier to connect with the internet and dominate the use of technology in the future.

The gadget itself has a definition as portable electronic devices that belong to either one or more of the following categories: mobile phones, MP3 players, gaming consoles notebook, tablets and i-touch (Gupta. N, Krishnamurthy. V, Majhi. J, dan Gupta. S, 2013).

International Data Corporation (IDC) describes the market growth opportunities and product delivery of smart devices, where the Tablet PC has opportunity to expand its market share and product delivery. IDC estimates that the amount of the tablets shipment can grow by 174.5% in 2017. This figure is the highest growth rate compared to other smart devices.

IDC also list the five most tablet PC shipments during the fourth quarter of 2012, that are Apple, Samsung, Amazon, Asus, and Barnes & Noble. Table 1 describes the Tablet PC market in 2012:

Table 1. Market Share of Tablet PC in 2012

Vendor	4Q12 Shipments	4Q12 Market Share	4Q11 Shipments	4Q11 Market Share	4Q12/4Q11 Growth
Apple	22.9	43.6%	15.5	51.7%	48.1%
Samsung	7.9	15.1%	2.2	7.3%	263.0%
Amazon.com Inc.	6.0	11.5%	4.7	15.9%	26.8%
ASUS	3.1	5.8%	0.6	2.0%	402.3%
Barnes & Nobles	1.0	1.9%	1.4	4.6%	-27.7%
Others	11.6	22.1%	5.5	18.5%	108.9%
All Vendors	52.5	100%	29.9	100%	75.3%

(Source: www.trenologi.com, accessed April 25th 2013)

The author conduct the survey using questionnaires which addressed the Tablet PCs seller at Bandung Electronic Center. The survey was conducted toward ten Tablet PCs sellers in order to obtain information about the Tablet PC brands that most sought after by consumers. The list of the Tablet PC brands that are often sought after by consumers at BEC are Apple, Samsung, Smartfren, Acer and ASUS.

In respond to the increasing market competition, the positioning of the Tablet PC needs more serious attention, because the possibility of differences in consumer perception of the Tablet PC users have impact to the Tablet PC positioning in a particular area. The differences make the company's strategies have to be applied in a particular area so that the products that distributed could be absorbed well by consumers. Positioning is considered by both academics

(Aaker & Shansby, 1982; Park, Jaworski, & MacInnis, 1986; Arnott, 1993, 1994; Arnott & Easingwood, 1994; Myers in Blankson & Kalafatis, 2004; Porter, 1996; Kotler, 1997; Hooley, Greenley, Fahy & Cadogan, 2001; McKenna, 1986; Bainsfair in Blankson & Kalafatis, 2004; Dovel, 1990; Trout & Rivkin, 1996) on Manhas (2010) as the key elements of modern marketing management.

The study was conducted in Bandung which is refers to what is informed by www.ekbis.sindonews.com, that Bandung has a potential market for the Tablet PC. The selection of Bandung Electronic Center (BEC) as a study site because BEC is the biggest and most comprehensive electronic shopping mall in Bandung. BEC also provides equipment and information technology equipment completely (www.anneahira.com). In addition, BEC also has higher number of visitors compared with the other gadget center in the city, reached 25000-30000 visitors / day (www.informasi-bandung.com). The other gadget center like Dukonsel only reached 2,500 visitors/day (www.inet.detik.com) and Mega Cellular Centre which is only reached 2,000 visitors/day (www.bisnis-jabar.com). Thus the purpose of this study was to analyze the Table PC positioning based on the perception of Bandung Electronic Center visitors.

Conceptual Framework

The purpose of the positioning is to create a unique and favorable image in the minds of target customers (Bhat, 1998). An important aspect of a brand's position in a product category is how similar or different the brand is perceived in comparison with other brands in the same product category (Dickson and Ginter, 1987). The brand position strategies element is considered to be important for the operationalization of the concept (Manhas, 2010). Fill (1999) states that the successful positioning can only be achieved by adopting a customer's perspective and by understanding how customers perceived products in the class. Positioning analysis requires more than an understanding of a product's image in the mind of the consumer. Other things that is also require is a frame of reference with the competition, since a position is a product's perceived performance, relative to competitors, on specific attributes (Lovelock, 1991).

Hooley, Sounders, Piercy (2006) state that competition can take place at various levels. Competition with products analogous qualities, competition in the same product group, competition with other product that satisfies the same or very similar consumer demand and also competition in the same level.

A positioning map provides a valuable means to position the product by graphically illustrating consumer's perception of competing products and their positioning. Positioning map develops understanding of how the relative strength and weaknesses of different product are perceived by buyers (Pranulis, 1998). Positioning map is an important tool in development and tracking of promotional strategy. It enables manager to identify gaps and opportunities in the market and allows monitoring the effects of past marketing communications (Arora, 2006).

According to Suryani (2012: 97), a perception process initiated by a stimuli that our senses know. Stimuli can lead to the perception of a variety of shapes, like everything that can be smelled, seen, heard, touched. These stimuli would be the sensory organ called sensory receptor. Direct or immediate response from the sensory receptor organs is called sensation. The level of sensitivity in sensation between one individual with another individual is different. The difference in sensitivity occurs because of the ability of the receptor among individuals that are not the same. In addition to the sensitivity factor, other factors that influence the intensity of the stimuli. Stimuli that have strong intensity will make the receptors easier to receive it. The perception process can be described as shown in Figure 1.

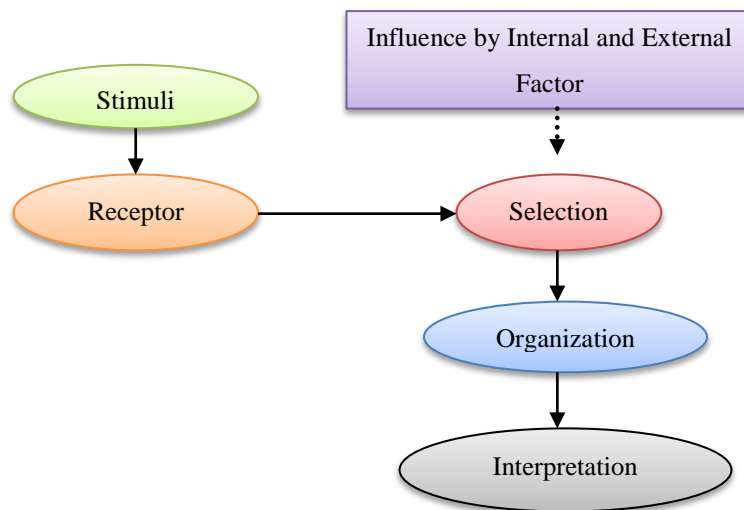


Figure 1. Perception Process

Previous Studies on Tablet PC

Lancaster (1966; 1971; 1979) on Manhas (2010) shows that consumer have preferences for characteristics (or attributes) of products. There are two basic versions of Tablet PCs, one

that includes a keyboard and one that doesn't. The keyboard variety doubles as a standard notebook computer, with the screen swiveling and being laid flat over the keyboard when utilized in tablet mode. The model without a keyboard, also termed a "slate", sacrifices functionality for lighter weight and smaller size. Generally speaking, tablet PCs command prices some several hundred dollars higher than comparably equipped (in terms of processing power, RAM, hard drive capacity, etc.) standard notebooks. Targeted commercial markets for tablet PCs include healthcare, insurance, sales force automation, finance and manufacturing/design (Himmelsbach 2004, Niccolai 2003).

Weitz, R. R., Wachsmuth, B. and Mirliss, D (2006) did a pilot project with the purpose of evaluating the usefulness of tablet PCs for university professors. The attributes used on that research were memory/hard drive/ processing speed, size of keyboard, size of monitor, external DVD drive, weight/ portability, wireless access, battery life, speech recognition, handwriting, and converting handwriting to text.

El-Gayar, O., Moran, M., & Hawkes, M. (2011) developed and empirically tests a factor model for understanding college students' acceptance of Tablet PC (TPC) as a means to forecast, explain, and improve their usage pattern in education. Simon, Ruth, Hoyer, and Su (2004) did a preliminary experiences with a tablet PC based system to support active learning in computer science courses. Anderson, Paul H. Schwager, and Riichard L. Kerns (2006) did a research about the drivers for acceptance of Tablet PCs by Faculty in a College of Business. Mock (2004) defines a tablet PCs as a traditional notebook computer with the added ability to process digital ink when writing with a stylus. Jung (2011) defines a tablet PC as a mobile computer, larger than a mobile phone or PDA, integrated with a flat screen and primarily operated by touching the screen rather than a physical keyboard. It may offer users an on screen virtual keyboard, a passive stylus pen, or a digital pen. Sim (2011) offers a definition of a tablet PC as a complex device that has the functionality of a MP3 player, a PMP, a netbook, and a smart phone with a touch screen interface for writing with a stylus. Furthermore, according to Lee, Euiho and Park (2012), Tablet PC and smartphones have similar characteristic, both are portable devices with a touch screen display, runs a computer operating system, easy to connect with a wide variety of applications and offers several wireless connectivity options such as wifi, 3G and LTE.

With the responses from consumers (50 respondents), it was seen that majority of attributes listed were taken into consideration while selecting a Tablet PC's brand. The final list of attributes developed after the pilot survey for Tablet PC category were: 1) Product Feature; 2) Brand; 3) Price; 4) Battery Life; 5) Life Style; and 6) Design.

Research Gap

Most existing researchs about Tablet PC are discuss on how the people adopting the Tablet PCs. Research about Tablet PC's brands position based on consumer perceptions is very limited. This research is develops the Tablet PC's position using theory of stimuli process of Suryani (2012). The conceptual framework is describes on Figure 2.

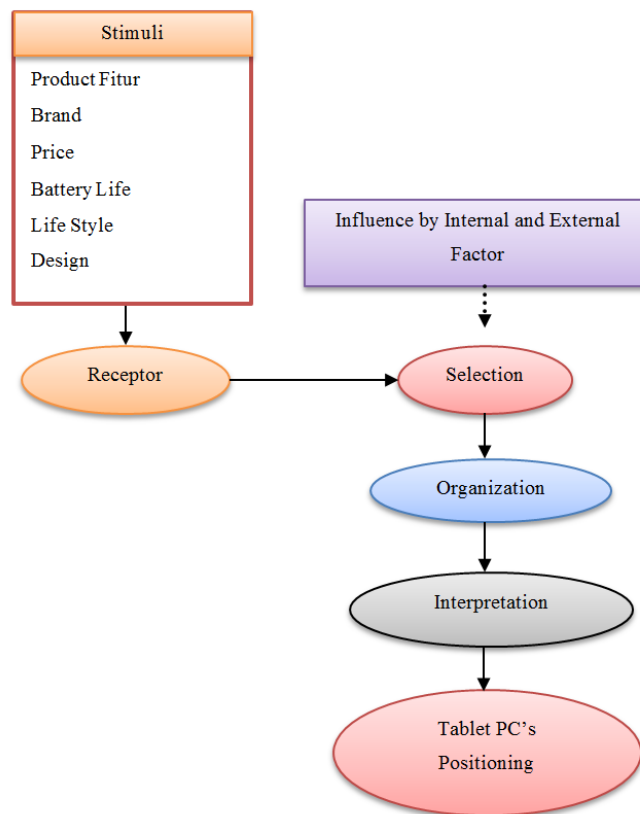


Figure 2. Conceptual Framework of Research

Methodology

Sampling Design and Population

The population for this research is BEC visitors that have or had using Tablet PC. The field interviews were conducted by researchers toward 10 Sellers and 50 Buyers in BEC. Ten

sellers informed about the most favourite brands for Tablet PC and 50 buyers informed about attributes that they most wanted on Tablet PC. In turn, the respondents selected using purposive random sampling. While on the implementation, the questionnaire distributed to the 100 respondents using purposive random sampling as well.

Statistical Technique Used

The technique used to analyze the data is the multidimensional scaling. According Hair et.al (2010: 568), multidimensional scaling is a procedure that allows a researcher to determine the appropriate a set of objects. The goal of multidimensional scaling is to change the similarity rating or preferences of consumers in the form of distance shown in the multidimensional space. Meanwhile, according to Simamora (2005: 234), multidimensional scaling is a procedure that is used to map the perceptions and preferences of the respondents visually in the geometry map. The geometry is called a spatial map or perceptual map, a translation of various dimensions that related. If the perceptual map is not seen clearly the difference lies visually, then we can calculate the euclidean distance of each brand. In principle, the smaller the euclidean distance, the closer the distance of each object and the higher the level of competition.

To calculate the Euclidean distance, we need to know the coordinates of each. Then the Euclidean distance can be calculated by the formula:

$$D = \sqrt{(x_i - x_{i-1})^2 + (y_i - y_{i-1})^2}$$

Where :

D = Euclidean distance

x_i = Coordinate x -i

y_i = Coordinate y -i

Relative weights of the two dimensions (x and y) can be described by direction vector for all of the attributes of the products that are comparable in their position. Direction vector of each attribute indicates the better or more preferred by consumers. Furthermore, to determine the ranking order of the products we can compare based on each attribute, it can be done by drawing a perpendicular line to the vector and the rank order of the products can be sorted from the closest to product to the end of the vector (arrow) of the attribute.

Result and Discussion

The analysis was conducted by calculating the euclidean distance of each position of Tablet PC on the related dimensions. In concept, euclidean distance, the closer to the Tablet PC on the related dimensions, the better of Tablet PC based on the dimensions. The calculation of Tablet PC based on dimensions and Euclidean distance are presented on Table 2 and Table 3.

Table 2. Euclidean Distance of Tablet PC

Tablet PC	Coord. of Tablet PC		Coord. of Dimension		Euclidean Distance			
	x	y	x	y	$(x_i - x_{i-1})^2$	$(y_i - y_{i-1})^2$	Ed	Rank
<i>Toward Product Feature</i>								
Apple	1.0448	-0.1981	0.8123	-0.5098	0.05405625	0.09715689	0.3117	1
Samsung	0.8270	-0.1396	0.8123	-0.5098	0.00021609	0.13704804	0.3702	2
Smartfren	-1.7808	-1.1631	0.8123	-0.5098	6.72416761	0.42680089	0.6533	3
Acer	-1.5772	1.3938	0.8123	-0.5098	5.70971025	3.62369296	1.9036	5
ASUS	-0.8919	0.5453	0.8123	-0.5098	2.90429764	1.11323601	1.0551	4
<i>Toward Brand</i>								
Apple	1.0448	-0.1981	0.9897	0.5644	0.00303601	0.5814063	0.764488	2
Samsung	0.8270	-0.1396	0.9897	0.5644	0.02647129	0.495616	0.722556	1
Smartfren	-1.7808	-1.1631	0.9897	0.5644	7.67567025	2.9842563	3.264954	5
Acer	-1.5772	1.3938	0.9897	0.5644	6.58897561	0.6879044	2.697569	4
ASUS	-0.8919	0.5453	0.9897	0.5644	3.54041856	0.0003648	1.881697	3
<i>Toward Price</i>								
Apple	1.0448	-0.1981	-1.8963	-0.2863	8.65006921	0.0077792	2.942422	5
Samsung	0.8270	-0.1396	-1.8963	-0.2863	7.41636289	0.0215209	2.727248	4
Smartfren	-1.7808	-1.1631	-1.8963	-0.2863	0.01334025	0.7687782	0.884375	1
Acer	-1.5772	1.3938	-1.8963	-0.2863	0.10182481	2.822736	1.710135	3
ASUS	-0.8919	0.5453	-1.8963	-0.2863	1.00881936	0.6915586	1.303985	2
<i>Toward Battery Life</i>								
Apple	1.0448	-0.1981	0.5440	-1.2384	0.25080064	1.0822241	1.154567	2
Samsung	0.8270	-0.1396	0.5440	-1.2384	0.080089	1.2073614	1.134659	1
Smartfren	-1.7808	-1.1631	0.5440	-1.2384	5.40469504	0.0056701	2.326019	4
Acer	-1.5772	1.3938	0.5440	-1.2384	4.49948944	6.9284768	3.380528	5
ASUS	-0.8919	0.5453	0.5440	-1.2384	2.06180881	3.1815857	2.289846	3
<i>Toward Life Style</i>								
Apple	1.0448	-0.1981	0.9923	0.5078	0.00275625	0.4982948	0.70785	2
Samsung	0.8270	-0.1396	0.9923	0.5078	0.02732409	0.4191268	0.66817	1
Smartfren	-1.7808	-1.1631	0.9923	0.5078	7.69008361	2.7919068	3.23759	5
Acer	-1.5772	1.3938	0.9923	0.5078	6.60233025	0.784996	2.717964	4
ASUS	-0.8919	0.5453	0.9923	0.5078	3.55020964	0.0014063	1.884573	3
<i>Toward Design</i>								
Apple	1.0448	-0.1981	0.9361	0.5240	0.01181569	0.5214284	0.730236	2
Samsung	0.8270	-0.1396	0.9361	0.5240	0.01190281	0.440365	0.672509	1
Smartfren	-1.7808	-1.1631	0.9361	0.5240	7.38154561	2.8463064	3.198101	5
Acer	-1.5772	1.3938	0.9361	0.5240	6.31667689	0.756552	2.659554	4
ASUS	-0.8919	0.5453	0.9361	0.5240	3.341584	0.0004537	1.828124	3

Table 3. Tablet PC's Position Based On All Dimensions

Dimension	Position 1	Position 2	Position 3	Position 4	Position 5
Product Feature	Apple	Samsung	Smartfren	ASUS	Acer
Brand	Samsung	Apple	ASUS	Acer	Smartfren
Price	Smartfren	ASUS	Acer	Samsung	Apple
Battery Life	Samsung	Apple	ASUS	Smartfren	Acer
Life Style	Samsung	Apple	ASUS	Acer	Smartfren
Design	Samsung	Apple	ASUS	Acer	Smartfren

Table 2 and 3 show that Apple brand was ranked first of consumer perceives based on product's features, while Samsung, Smartfren, ASUS and Acer respectively were ranked under the Apple. Apple Tablet PC did concentrated marketing rather than competing and dealing directly with other Tablet PC manufacturers when they cut prices and focus on volume. Apple is investing in research and development, by developing the iOS operating system and make it as a prime mover in its smart device. The availability of a wide range application in the App-store which can only be used on this particular Tablet PCs with the operating system make Apple iOS as a determinant of industry trends. When Google produced Android operating system for Tablet PCs, they did not encourage the developers to create applications that were specific to a tablet PC, there are applications that can be used on various types of devices. Apple took a different path, they encourage developers to create applications that focus only reserved for the iOS operating system. This is why Apple Tablet PC has a lot of good applications and only a few applications that can work well on other devices. A recent study by a company called uTest indicates that Apple provides the best quality applications than Google. Related to the brand, a report from Strategy Analytics revealed that Samsung apparently has stronger brand than Apple in terms of the overall electronics brand preference.

Smartfren was ranked first of consumer perceives based on dimension of price, while ASUS, Acer, Samsung and Apple respectively were ranked under the Smartfren. Today, Smartfen mobile operator increasing their mobile devices selling, the smartphones and tablet PC. Their new products have hardware specification called "lumayan" (tolerable??), but they certainly have affordable price. Smartfren Tablet PC, New Andromax Tab 7.0, is one of the successful mobile devices that hypnotize the lower-middle market segments. New Andromax Tab 7.0 is only available in Indonesia, where the Tablet PC is manufactured to meet the needs of customers who want a Tablet PC at an affordable price, considering the price of other brands of

tablet PCs pegged at a very high price by the company. Like Apple for example, which occupy the last position on the price dimensions.

Samsung was ranked first of consumer perceives based on dimensions when viewed from the battery life, while Apple, ASUS, and Acer Smartfren consecutive rank under Samsung Tablet PC. Samsung is manufacturing batteries for smartphones, tablet PCs and Galaxy series cameras managed to occupy the first position of small-sized battery market. The data obtained from the marketing research institute based in Japan, B3. The market share of lithium-ion Samsung reached 26% by the end of 2012, followed by Panasonic with 18.7% market share, LG Chem 17.5%, and Sony 8%. SDI, a unit that produces lithium-ion Samsung, managed to break the record after producing 1 billion battery for the first time. In addition to its own purposes, Samsung also supplies batteries for Apple's iPad and iPhone.

For the dimensions of lifestyle, Samsung excels compared to other brands. By offering various products and marketing to the segment, Samsung expects higher sales and a stronger position within each market segment. Samsung was grouping their segment into categories, Tablet PC Samsung released the Samsung Galaxy Tab 3 into three different types, namely 7.0, 8.0, 10.1, which each type represents the size of the Tablet PC screen. Meanwhile, Apple released the iPad with different types according to the amount of embedded memory on the device. Another example, Samsung was trying to target women users by offering the Samsung Galaxy Tab 2 7.0 La Fleur. Motif La Fleur now is very trend in the fashion world, it was taken from French which means flower. Florals are very suitable for women because impressive feminine. Samsung Galaxy Tab 2 7.0 La Fleur came with a red color cast. The women are usually enjoy the selfie and together photos activities, that is why the Samsung Galaxy Tab 2 7.0 La Fleur insert 3 MP camera coupled with VGA front camera. The differences of the Samsung Galaxy Tab 2 7.0 La Fleur from the regular version, is that there are several applications intended specifically for women. Application installed on Samsung Galaxy Tab 2 7.0 La Fleur are a recipe app, yoga, office, and also clothing color combinations application, etc. Not only that, Samsung also slipped the application related with beauty, lifestyle, and health. To enhance the appearance, it came with wallpapers and ringtones that have been adapted to woman preferences.

Finally we discuss the design, since first producing OLED screen in January 2007 Samsung Display had reached 300 million productions in January 2013. This achievement confirms Samsung as a world's largest OLED screen manufacture. OLED display screen is now known as the most widely used for electronic devices in the world. Some devices that often use this type of screen are smartphones, tablet PCs, digital cameras, and TV. Apple was ranked second, which is the closest competitor of Samsung in design. Apple rely on the supply of LCD screens from Samsung for iPad mini 2. Apple actually has sought to reduce its dependence components supply from Samsung. But in fact, the AU Optronics and Sharp were previously believed to support the needs for the screens of Apple devices got problems with quality. Apple then seems still can not be separated from Samsung, at least for now. The map position of the entire brand of Tablet PC can be seen in figure 3.

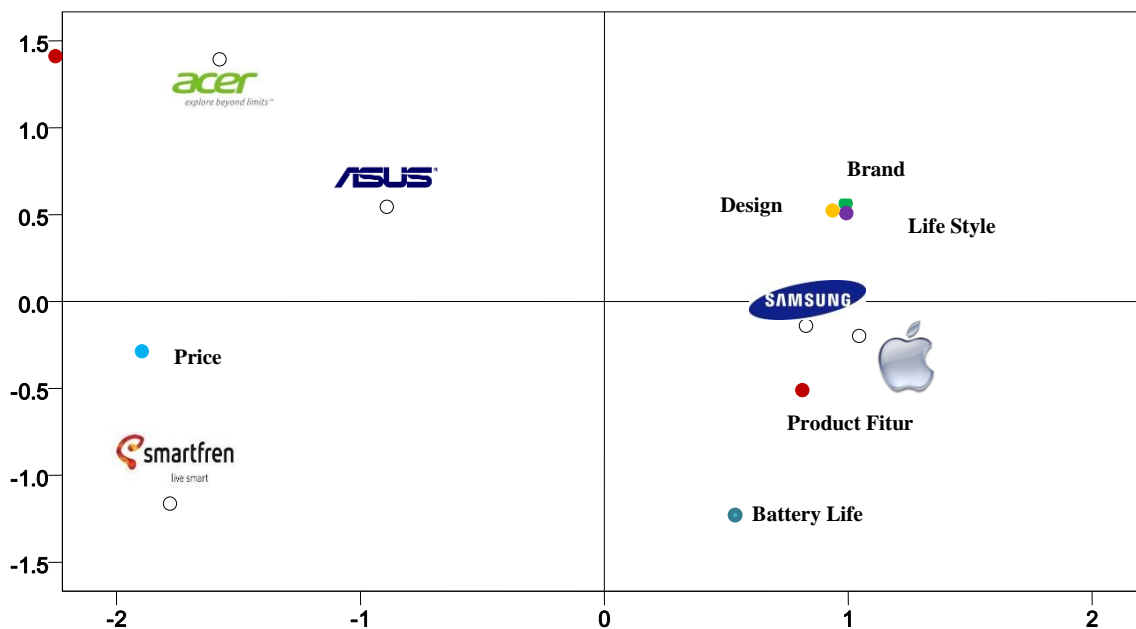


Figure 3. Position of Tablet PC on Perceptual Map

Conclusion and Further Research

Regarding the dimension of product features, the best Tablet PC is Apple based on the perception of visitors of Bandung Electronic Center. In the area of brand dimension, battery life, life style and design, Samsung is the best. While Smartfren superior lies on the price dimension. In the map position, Apple is a competitor of Samsung with the advantages of product features,

design, life style, battery life and brand. Acer is direct competitor to Asus, while Smartfren is not compete with other brands in this research but might be with other brands outside the research, like Mi-to and Advan. Future research are expected to use other indicators of Tables PC and to add other brands to reach our knowledge about Tablet PC positioning in the market that will useful for Tablet PC companies and Tablet PC sellers.

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