Pricing of Miniature Vehicles Made from Telephone Card Waste

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Abstract. The number of electronic devices in Indonesia in the last 10 years has been increasing quite drastically which contributes to more electronic waste. E-waste or electronic waste have different characteristics from other kinds of waste. Components of electronic waste often poisonous, consisting dangerous chemicals. The telephone card wasted is also an electronic waste. One alternative to handle and manage telephone card waste is to recycle it into collectible miniature vehicles. But the price of these miniatures is quite high, causing low interest in buying them. A research on the price of miniature vehicles in relation to consumers' Ability to Pay (ATP) and Willingness to Pay (WTP) needs to be done. Segmentation analysis data, target, product positioning and product marketing mix are needed before commencing the research. Data collection is done through a survey by spreading questionnaire to 100 miniature vehicle collectors in Semarang, questioning their ability and willingness to pay recycled miniature vehicles. Calculations showed average ATP of Rp.112.520, 24 and average WTP of Rp.76.870. The last result showed the estimate pricing according to ATP and WTP which is Rp.66.000 with 58% of the respondents claiming to be willing and able to pay that price.

Keywords: telephone card wasted, miniature vehicles, ATP, WTP

1. Introduction

The increased need of electronic communication service has encouraged the development of electronic industry in Indonesia immensely. The amount of electronic equipment in Indonesia during the last ten years have increased quite drastically, resulted in the increase of electronic waste [1]. E-waste or electronic waste has different characteristics than other kinds of wastes. This is due to the dangerous and toxic substances, components of the electronic goods [2]. A phone card that is no longer being used by the user is one of these electronic waste.

The telephone card is included in the plastic electronic waste type that pollute the environment because of its low decomposition rate, which may reduce the level of the fertility of the land. Telephone card consists of a body made from PVC plastic and the Universal Integrated Circuit Card (UICC) with metal contacts and a pinned semi conductor. Waste containing PVC plastic is difficult to recycle and harmful to both health and the environment. If the PVC is burned, it may release poison, potentially harming the kidney and heart. According to [3], PVC waste that contains chlorine can pollute the environment if it is not processed before it is disposed. The PVC nature of chlorine makes it easy to react with other compounds and formed other compounds such as organo-chlorine compounds, which are toxic compounds with carcinogenic effects on human. While the circuit section contains various metals including Cadmium Beryllium that pollute the environment and may affect the nervous system, kidneys and lungs [4].

One of the handling and management method is by recycling, telephone card waste. Based on Act No. 18 Years 2008 about garbage management and Government Regulation Number 81, year 2012 stipulates the need for a paradigm change based on the management of waste; from the collect-

transport-dispose paradigm into treatments focusing on reduction of garbage and waste handling or better known as Reduce, Reuse and Recycle. Recycling process may produce an opportunity to open new jobs and establish a better social behavior [5]. The telephone card waste can be recycled into a miniature vehicle which function as a product or collector items.

Miniature vehicles from telephone card waste is produced by craftsmen in Ngabangan village located in Johar, Semarang. This product has started gaining recognition in the market either directly or through online media, ranging from Rp.50.000 to Rp.500.000. According to the craftsmen of miniature vehicles from recycled telephone card waste, the response of society toward the prices vary. Some consumer responds positively to the price, but for some other consumer the product is considered too expensive. Based on an introductory survey of 8 respondents who had bought miniature vehicles made from recycled telephone card waste, 5 respondents stated the price is too expensive for a product with materials that come from recycled waste, 2 respondents answered that product prices are in accordance to the willingness to pay, and 1 respondent stated that the prices may still be raised because the product has a high artistic value. Whereas with the purchase of recycled products, consumers participated in assisting waste management of telephone card waste that pose a threat to the environment.

There are four important factors in the marketing efforts of a product, namely price, product, place, and promotion [6]. From those four factors, price is the factor that has the most weight. The selling price of a product is determined based on the cost of production added to profit margins. However, references about the willingness of consumers to pay and the ability of consumers to pay must also be put into consideration in determining the selling price of a product. The determination of customer's WTP is fundamental in market research [7]. Some of the previous research on willingness to pay and ability to pay that have been done, including WTP and ATP for water supply service in the Gaza Strip [8], ATP and WTP to waste handling [9], ATP and WTP for electricity [10], the WTP for environmental protection [11], WTP for environment-friendly products [12], the WTP for organic food [13] and WTP for renewable energy [14].

In order to reduce waste from the use of telephone cards, a research needed as a form of concern for the environment and to promote these telephone cards recycled products to the community. In this paper a research of the willingness to pay and the ability to pay for a community, especially in Semarang on a telephone card recycled products in the form of miniature vehicles. It is expected that by doing this research, a value is obtained in accordance with the ability and willingness to pay of a community so that they can improve the people's interest in telephone card recycled products.

The objectives of this research are to determine the value of ability to pay off people in Semarang towards miniature vehicles from the telephone card waste, determining the value of willingness to pay off people in Semarang towards miniature vehicles from the telephone card waste, and determining the price of miniature vehicles from the telephone card waste based on the ability and willingness to pay.

2 . Research Methodology

This research focuses on the miniature vehicle tank made from telephone card waste. This is due to the fact that this product is the most preferred one by consumers. This research done to determine the price of miniature vehicles from telephone card waste in Semarang through ability to pay (ATP) and willingness to pay (WTP) approach.

Collecting the data is done through survey state preference method. The sample or respondent criteria of this research are native Semarang people that collect miniature vehicles as a hobby. The design of the questionnaire is divided into 3 parts which are the characteristics of respondents, designed to know the characteristics of respondents with some questions such as the name of the respondents, age, gender, education, work and level of concern for the environment. The second part of the questionnaire is ATP, designed to know the consumers' ability to pay a recycled miniature based on an ideal considered income. The factors that are used to determine ATP towards miniature vehicles from recycled telephone card waste is the total income of respondents, income allocated to the product, cost allocation to buy a miniature vehicle monthly and the monthly purchase frequency.

The third part is WTP designed to know the scale of average money that is willing to be issued by the respondents as payment of one unit of miniature vehicles from recycled telephone card waste. The questions used to determine WTP are the expected price, expected product quality (product value), and a willingness to pay more for a telephone card recycled.

Prior to the spread of the questionnaire, the number of samples needs to be determined. Sampling techniques used in this research are purposive sampling technique. Purposive sampling is a sampling technique with some specific considerations that aims to have a more representative data obtained from the research. The sample or respondent criteria of this research are native Semarang people that collect miniature vehicles as a hobby. Determining the number of samples with a 95 % level of trust and 10% limit sampling error, can be determined that the minimal number of samples is 96,04 or it can be said that a minimum number of samples is as much as 96 samples. So, this research uses 100 samples as the respondents.

2 .1 Ability to Pay (ATP)
According to [15], the Ability To Pay (ATP) is the ability of a person to pay for the services or products that it receives based on income is considered ideal. The approach used in the analysis of a product's ATP is based on the cost allocation for the product purchase and intensity of purchase. This scale shows the ability of society to pay a product that they will buy.

Qualitative approach is more accurate to know the exact ATP. This approach can provide a more complete picture about financial capabilities, including explores the details of the dilemma, priorities and decisions and its impact on an individual [16]. Quantitative studies, through survey also can be done to know the value of ATP by asking respondents directly, how high is the respondent's ability to pay for a product or service, known as revealed ATP. Through household budget approach the ATP can be obtained:

$$ATP = \frac{(lt.Pp).Pt}{Tt} \qquad (1)$$

Whereas:
Lt = total income per month (Rp/Ex./month)
Pp = the % age of expenditure for the miniaturized products per month of the total income
Pt = the % age of expenditure for the miniature vehicles from miniature spending
Tt = total purchase miniature vehicles per month

2 .2 Willingness to pay (WTP)
WTP can be interpreted as the maximum amount that a person is willing to pay to avoid a downturn toward something (a decrease in the environment and natural resources, or quality) [17]. The determination of the WTP in this research used Custom Contingent Method (CVM). CVM is a method of counting by asking the society their willingness to pay (WTP) directly focusing on personal preferences valuing objects based on standard value for money [18]. The implementation of the CVM in measuring a good/services can be divided into several stages, namely:
- Stage one: Developing Hypothesis Market
  The development of a hypothesis market questioned is the first stage that must be done in CVM studies. The scenario of the activities must be described clearly in the survey instrument so that respondents can understand environmental objects that questioned and community involvement in the planned activities. The questionnaire also describes whether respondents will pay a certain price and the decision about continuing or discontinuing planned activities.
- Stage two: Determining Offering Value
  In the questionnaire, each individual was asked about value for money willing to be paid (WTP). To get this value it can be achieved through the following ways:
  a. Bidding games, namely the smallest value on offer from is given to the respondents to achieve maximum WTP values willing to be paid by the respondents.

b. Closed-ended referendum, namely a single offering value given to respondents and ignoring the agreement nor disagreement of the respondent.

c. Payment Card, is a ranged value served on a card that might indicate the type of respondents towards spending on public services provided.

d. Open-ended question, with each respondent asked the maximum WTP willing to be paid with no value of the offer given.

- Stage three: estimating the value of average WTP

  After the value on offer obtained, then immediately the average WTP value calculated using the following equation:

$$\text{MWTP} = \frac{1}{n}\sum_{i=1}^{n} WTPi \qquad (2)$$

Whereas:
MWTP   = average WTP
N   = sample size
WTPi   = maximum WTP values of respondent number -i

The centralization value used is the middle or median. The median value is not affected by the extreme value of the offer, but almost always lower compared with to the middle values.

- Estimate the of willingness to pay (WTP) curve

The respondents WTP curve obtained using the number of individuals who choose WTP value cumulative. This curve relationship will illustrate the level of WTP which are willing to be paid by the number of respondents who are willing to pay at the level of the WTP.

2 .3 Relationship between Ability to Pay (ATP) and willingness to pay (WTP)

The relationship between ATP and WTP can be described in these conditions:

1. ATP > WTP

This condition shows that the ability to pay is greater than the desire to pay the product/services. This happens when the user has a relatively high income, but relatively low utilities toward the services/product.

2. ATP < WTP

This condition is the opposite of the first condition, whereas the desire of the user to pay for services/product is greater than the ability to pay. This is possible for users who have a relatively low income, but very high utilities towards the services/product so that the desire of the user to pay services/products are likely to be influenced by utility.

3. ATP = WTP

This condition shows that between the ability and the desire to pay services/product is the same, this condition happened when the user utility balanced with the costs incurred to pay services/products.

2 .4 Cost of Good Sold (COGS)

The calculation of COGS's needs to be done as the lower limit value of the price determination based on the respondents' ATP and WTP. Cost of production is accumulated from the cost burden of the products produced by the company or the use of various economic sources to produce products or acquire assets. In this research, determining the products' COGS used activity based costing system. The calculation of COGS with ABC system provides a more accurate calculation of the product cost and also provides a calculation of what is causing the cost and how to manage them [19].

3. Results and Discussion

This section contains segmenting, targeting, and positioning, identification data collection and product marketing mix, characteristics of respondents, calculation of products' COGS, the results of ATP and WTP and its relationship with COGS.

3.1 Segmenting, Targeting and Positioning (STP) Products

Businessman needs to analyze STP to identify and create profiles from different buyer groups, who may prefer a diverse mix of products and services, by examining demographic, psychographic, and behavioral differences among buyers. Businessman will also achieve better results if they choose their target market carefully and prepare an appropriate marketing program.

The market target in the marketing of miniature tank products is included in the niche market, which is more focused on market niches that have not been served well. In this case, recycled miniature products are focused on consumer groups that have a hobby of collecting unique miniature vehicles and rarely sold in the broad market. Miniature tank can be a solution for consumers who want a collection of products that are not monotonous, different from other products and environmentally friendly because it is made from recycled electronic waste.

3.2 Product Marketing Mix

The products offered are a miniature of vehicle type N4E tank made from telephone card waste. All the materials used in the making of the products were derived from items that are no longer being used (used goods) initially having no value into a product with added value. The process of making is handmade without the help of the machine to maintain aesthetics, details and artistic value of the product.

The handicrafts center producing miniature from recycling waste is located in Semarang. Product marketing is also done in the city of Semarang. Now, the craftsmen have yet to have a store or special distribution place that can expand the product marketing place, so customers who want to buy can come directly to the address or buy on the craftsmen bazaar, event and exhibition held in Semarang.

The promotion is done to suppress the market so an interest will rise and introduce the concept of miniature vehicle from recycled telephone card waste that will encourage purchase. The promotion and introduction of the product are often done by some media coverage, namely via special coverage in television, magazines, newspapers and other mass media. Other promotional media used are social media and handicraft training or workshop. Social Media such as Facebook, twitter, and instagram are able to describe and explain the products complete with photos of the product itself, making it easier for customers to obtain detailed product information. In addition, other promotions are also done by opening exhibition stands on events or bazaar held in the City of Semarang

The price of a miniature vehicle from recycled telephone card waste varies from 50.000 rupiahs to 500.000 rupiahs depending on the complexity and details of the product. For the tank itself sold at the price of 150.000 rupiahs.

3.3 Respondent Characteristic

Data collection is done by spreading questionnaires either directly or through an online questionnaire. Samples were selected based on purposive probability non probability sampling technique, whereas in this method is not all members of the population have the same opportunities nor have the special characteristic of a respondent. Respondents were selected based on compatibility with the products' STP namely miniature vehicles collecting hobby, 20-50 years old, have personal income, and willingness to be made respondents in the research. The characteristics of the respondent can be seen in table 1.

In addition, the purpose of respondents buying these miniature vehicles was varied from the collection, decoration, qualifying for a contest, investment, modification, or photography. Respondents can answer more than one answer in determining the aim of buying a miniature vehicle. The purpose of respondents in buying miniature vehicles is presented in the Venn diagram in figure 1.

Table 1. The Characteristics of Respondents

Characteristics		Number of respondents	Percentage (%)
Age	20-25	34	34
	26-30	35	35
	31-35	15	15
	36-40	5	5
	>40	11	11
	Total	100	100
Gender	Men	88	88
	Women	12	12
	Total	100	100
Education	Junior High School	1	1
	Senior High School	23	23
	University	76	76
	Total	100	100
Work	Civil Servant	7	7
	Private Sector employees	54	54
	Self-employed	37	37
	Other (doctors)	1	1
	Other (Freelance)	1	1
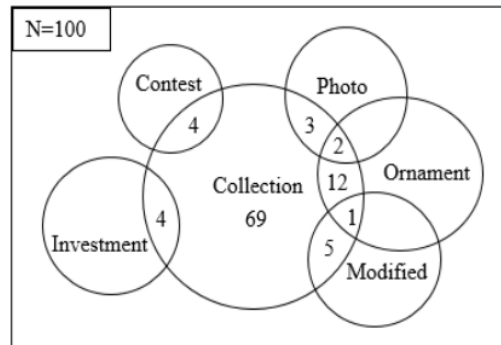
Figure 1. The Purpose of Respondents Buy Miniature Vehicles

3.4 ATP

Determining the respondents ATP value is based on the calculated average monthly income of the respondents, cost allocation of miniature purchase, cost allocation of a miniature vehicle purchase and the frequency of miniature vehicles purchase per month. The average earnings of respondents, about 26% of respondent's income stands between 3.000.000-3.999.000 rupiahs per month, 25% of respondents earn about 2.000.000-2.999.000 rupiahs per month. After the calculations are done, the average value of ATP from 100 respondents is 112.520,24 rupiahs, this value means the value of the ability of a respondent to buy a miniature vehicle product is 112.520,24 rupiahs. It is known as much as 31% respondents are able to pay and as much as 69% respondents haven't been able to pay the miniature vehicle product at 112.520,24 rupiahs. The frequency distribution of respondents's ATP per grade price can be seen in table 2 and figure 2.

Table 2. Frequency Distribution of ATP

Price (Rp)	Freq (person)	Freq (%)	Cum. Freq. able to pay (%)
4000-73.999	38	38,00%	100,00%
74.000-143.999	39	39,00%	62,00%
144.000-213.999	13	13,00%	23,00%
214.000-283.999	3	3.00%	10,00%
284.000-353.999	3	3.00%	7.00%
354.000-423.999	2	2.00%	4.00%
424.000-493.999	1	1,00%	2.00%
494.000-563.999	1	1,00%	1,00%
Total	100	100,00%	
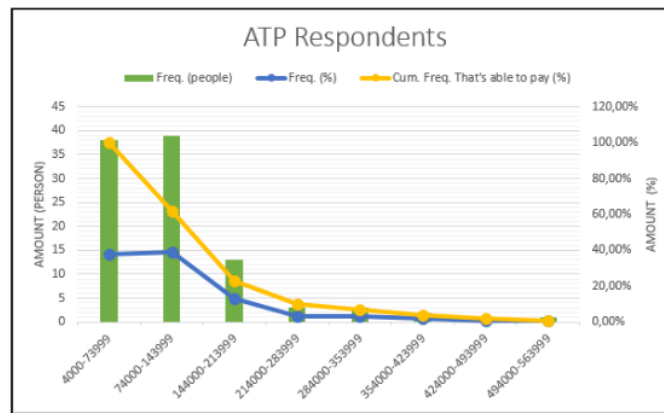
Figure 2. The ATP respondents

3.5 WTP

WTP is the calculation of respondents' willingness to pay a tank miniature from telephone card waste based on the price of the products according to the respondents and the willingness of respondents to add more cost to the purchase of environmentally friendly recycled products. The WTP technique in this research used the direct method or survey with Contingent Custom Method (CVM) analysis. There are several steps that have to be done for CVM analysis in order to know the WTP values of respondents. The steps are as follows:

1. Build The Hypothetic Market

At this stage the respondents were asked about their hobby collecting miniatures and their main consideration in buying miniature vehicle products. Then the respondents were invited to think for a moment about environmental issues which are an electronic waste problem in the form of telephone card that increasingly disposed to the environment. Respondents were also informed on the negative impact and the danger of a telephone card thrown into the environment if not immediately handled through 3R (Reduce, Reuse and Recycle). Then the mind of respondents was directed on the miniature vehicles product alternative made from the of recycled telephone card waste. The information presented in the form of a description which includes detailed product information and pictures that are listed in the questionnaire. The information aims to provide an overview for the respondents

toward the hypothetical market in question, this will reduce bias in the next stage. After the information we're given respondents the given the question of whether respondents are willing to pay more for the recycled miniature vehicle with a certain price class or an equivalent product that were not made from recycled materials. Respondents then informed that with a willingness to pay means he/she will have participated in support of telephone card waste management and support the craftsmen of the recycled products economy.

2. Getting the value of the Offer

This step is done to obtain the maximum value that is willing to be paid by customer in purchasing the miniature vehicles from recycled telephone card. The method is done using open-ended question, or open questions which is done by asking customers directly how much the number of maximum values that they will pay for any goods or services in this case is recycled miniature product. The advantages of this method are the customer does not need to be given instructions that can affect the value given by customers. This method does not use the initial values offered so it will not rise early data bias (starting point bias).

3. Calculate Average WTP value

This value is calculated based on offering value obtained in the second stage. At this stage, each respondent WTP and average WTP value are calculated and the centrality of data is calculated from each respondents' WTP as included in table 3 for more description of the value that represents the value of center or central value from the WTP. The centrality values such as mean, median, and modus are calculated to represent all values in the WTP data.

Table 3. The Centrality of WTP Data

Centrality of Data	Results
Mean	76.870,00
Median	70.000,00
Modus	65.000,00
Range	120.000,00
Minimum	45.000,00
Maximum	165.000,00

Average respondent WTP values are as much as 76.870 rupiah, which means the respondents is willing to pay for a miniature recycling vehicle type N4E tank as much as 76.870 rupiah. It is known as much as 37% of respondents are willing to pay and 63% of respondents are not willing to pay a recycled miniature type N4E tank at the price of 76.870 rupiahs. The results of the average WTP are lower than the price of the product which has been specified previously at 150.000 rupiah so this could be a surplus of 73.130 for producers. Producer surplus is the condition when the amount received from the manufacturer is greater than the amount that needs to be spent to produce goods or services [20].

4. Estimate WTP offers curve

The WTP offer curve is obtained from the cumulative frequency of respondents toward the maximum value in its willingness to pay. To create a WTP graph the data need to be presented in the form of distribution of WTP frequency that is willing to pay and the cumulative of the respondents that are willing to pay as presented in table 4 and figure 3.

Meanwhile, as much as 76% of respondents are willing to pay more and 24% of respondents are not willing to pay more for environmentally friendly recycled products in the form of a miniature vehicle. Respondents who are not willing to pay more say that the form of recycled miniature products is not quite telephoneilar to the original objects, the products are less smooth in finishing, and details less visible. Some also said that recycled items can't be made as investment items.

Table 4. The Distribution of WTP frequency

Price (Rp)	Freq (person)	Freq (%)	Cum. Freq. willing to pay (%)
45.000-60.499	24	24.00%	100,00%
60.500-75.999	39	39,00%	76,00%
76.000-91.499	19	19,00%	37,00%
91.500-106.999	6	6,00%	18,00%
107.000-122.499	7	7.00%	12,00%
122.500-137.999	1	1,00%	5,00%
138.000-153.499	3	3,00	4,00
153.500-168.999	1	1,00	1,00
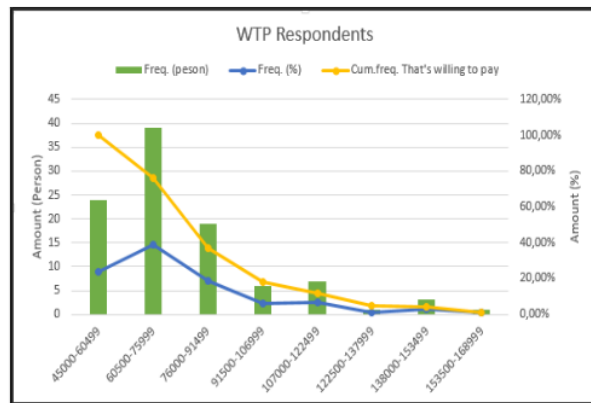
Figure 3. WTP Respondents

3.6 ATP and WTP Price determination

The average ATP is greater than average WTP. This condition shows that the respondent's ability to pay is greater than the desire to pay for a recycled miniature vehicle. This happens when the user has a relatively high income, but the product utility is relatively low.

Based on the graph in figure 4, the meeting point between the respondents' ATP and WTP located within the range of Rp60.000 to Rp79.999. For more detailed results, a comparison then conducted between ATP and WTP on a range of Rp60.000 to Rp79.999 as in figure 5. The result shows the intersection of ATP and WTP is located on Rp66.000 with as much as 58% of respondents are able and willing to pay a miniature vehicle from recycled telephone card waste at Rp66.000. This means the price is in accordance with the ability and willingness to pay of the collectors for a recycled miniature product type N4E tank at Rp 66.000.
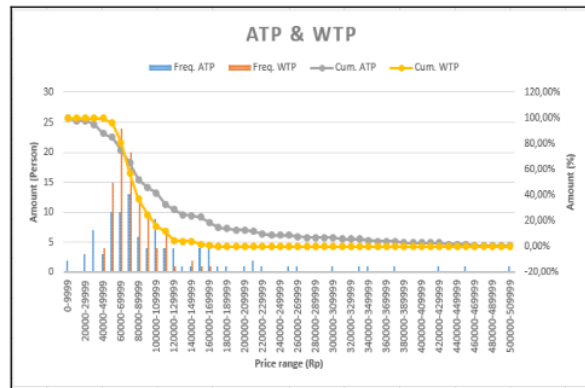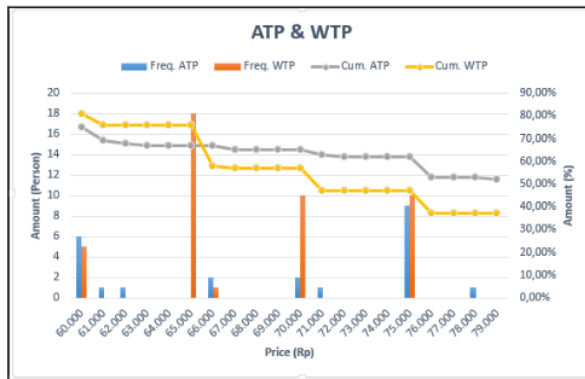
Figure 4. ATP and WTP respondents

Figure 5. Respondents's ATP and WTP on price range of Rp60.000-Rp79.000

3.7 Calculation of Products' COGS

Determining the core cost of production is more accurate, by using activity based costing system (ABC). Activities that occur in the creation of a recycled miniature vehicle type N4E tank are grouped in 3 cost drivers namely assembly, coloring, and packaging. COGS is divided into three main elements which are raw material cost (RMC), labor cost (LC), and overhead cost (OC). The main element of the first cost is raw materials. All the raw materials used in the making of a recycled miniature vehicle type N4E tank are obtained from the results of waste donations, donated by the community so the raw materials costs used is Rp0. The details of raw materials used can be seen in table 5.

Meanwhile, the second key element is labor cost. Labor costs are the directly issued wages of labor to produce a recycled telephone card miniature vehicle product each month. Product creation is done by the business owner without any additional labor. So the amount of labor in the manufacture of products is 1 person.

Table 5. Raw Materials of Recycled Miniature

No	Raw Materials	Number of Purchase	Prices of Raw Materials (Rp)	Total Raw Materials Costs (Rp)
1	Telephone card	625 Pcs	Rp 0 (garbage Donation)	Rp 0
2	Mineral water bottle cap	275 Pcs	Rp 0 (garbage Donation)	Rp 0
3	Electronic Waste Parts	150 Pcs	Rp 0 (garbage Donation)	Rp 0
		Total		Rp 0

The labor cost determined based on minimum wage of Central Java 2017 is 1,367,000 to 40 working hours in one week. Based on four weeks in a month, so wages based on direct working hours is Rp. 8.543,75. The average production of miniature type N4E tank in one month is 25 units with a production time 2 hours per product. The number of direct working hours for the miniature vehicles type N4E tank per month is 50 hours (2 hours x 25 units / month), so the labor cost of type N4E tank products is Rp.427.187,5/ month.

The third main element is overhead cost. The cost included in the overhead costs are costs that are not directly influential in determining the core product cost. This costs happens because of activities done in producing a recycled miniature vehicle, it counts from the start, from raw materials to the end product. Now the overhead cost on every activity to create a recycled miniature type N4E tank can be seen in table 6.

Table 6. Overhead Cost of Recycled Miniature type N4E tank

No	Cost group	Total Cost (Rp)
1	Assembly Activities	Rp109.027,5
2	Coloring Activities	Rp 100,000
3	Packaging Activities	Rp750,000
	The Total Overhead Cost	Rp959.027,5

After adding the cost of raw materials, labor and overhead, then obtained the COGS of miniature type N4E tank at Rp.1.386.215 or Rp.55.448,6/unit. The result this COGS will be lower limit in determining the price of a miniature vehicle type N4E tank based on respondents' ATP and WTP.

3.8 Comparison of ATP and WTP towards COGS

It is concluded that the result of COGS type N4E tank is at Rp.55.448,6/unit. When coupled with sales margins of 20% the selling price of the product based on COGS calculation is Rp46.033,32. The value of COGS is the lower limit of the price determination based on ATP and WTP. Meanwhile, based on the determination of the price through ATP and WTP, 58% of respondent are able and willing to pay the price of Rp66.000. It is known that the results of the determination of price based on the value of respondents' ATP and WTP are greater than the products' COGS value This may indicate that the price determination based on ATP and WTP does not result in a loss for the manufacturer.

The price of miniature N43 sold by craftsmen was at 150.000/unit, far above the value of respondents' ATP and WTP. This may indicate that the current price of the miniature is not in accordance with the ability and willingness of collectors in Semarang to pay and purchase the product. A review related to the selling price of products to match with the ability and the willingness of consumers to buy need to be done so that the interest toward recycled products can increase. For more details can be seen in figure 6.

3.9 Products Value

Analysis of the product value is an information that the researcher wants to know to obtain the value or benefits of the product that will be enjoyed when consumers buy the product. 43% of respondents answered, by purchasing recycled miniature products they are reducing waste or waste thrown into the environment. 38% of respondents answered recycled miniature vehicle is unique and unthinkable, 10% of respondents said there is a certain satisfaction when buying a recycled miniature vehicle, 2% of respondents said that they got new education about waste management, 2% of respondents said that they are now more motivated to become more creative in making handicrafts from garbage, but there are 5% of respondents that said they will not receive the value or benefits of anything because the product less attractive. Respondents also stated that the shape of recycled miniature is not quite telephoneilar to the original object, the product was less smooth in finishing, and the details less visible. There were some respondents that said that recycled collections can't be invested.

According to craftsmen of telephone card products waste, his products have advantages in terms of the scarcity of product. Telephone card waste miniatures are still very rare circulating in the wider markets so when they can buy this product there is a certain sense of satisfaction. In addition, recycled miniature product have high artistic value because it is a handicraft (handmade) and a result of creativity unthinkable by many people. This product also contains the educational value and motivation for customers and the community in order to be more responsible in waste management to maintain the environment and produce products that has selling value. So recycled products are no less competitive than non-recycled products.
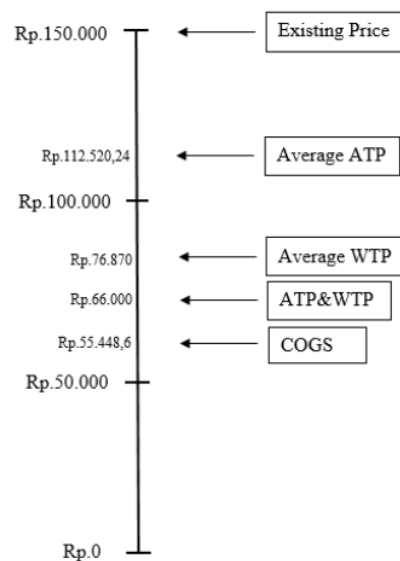

Figure 6. Comparison of ATP and WTP with COGS

4. Conclusions

Average respondent ATP value fof 1 unit of miniature vehicles is Rp112.520,24. This means that the respondent's ability in buying a miniature vehicle is Rp112.520,24. It is known as much as 31% respondent able to pay and as much as 69% respondent has not been able to pay the miniature vehicles at Rp112.520,24. The main purpose of respondent in buying the miniature product is for collection,

modification, decoration, contest, photography, or investment. While the major considerations for most respondents in buying the miniature is its high artistic value.

Based on the WTP calculations, the average WTP value of respondents for one miniature product type N4E tank is Rp76.870. This means that the respondent's value of willingness to pay in buying a miniature product type N4E tank is Rp76.870. It is known as much as 37% respondent is willing to pay and as much as 63% respondent are not willing to pay a miniature product at Rp76.870.

The results of this study showed, as much as 58% of respondents are able and willing to pay a recycled miniature vehicle type N4E tank at the price of Rp 66.000. It is known that the results of that price value are greater than the lower limit of the COGS price product. Determining the price in accordance with the ability and willingness to pay for a recycled miniature vehicle type N4E tank at Rp66.000. There are also values in the products according to respondents which are the uniqueness of the value of education and motivation in waste management to maintain and reduce environmental pollution. In addition, there are also respondents complaining of the smoothness of the product, less detail, and the product cannot be used for future investment.

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