

# Smartphone Donation for Education: A Technopreneurship's Approach in Indonesian Case Study

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**Abstract.** This paper proposed a smartphone donation to help Indonesian students in remote areas and those who needed help, such as students in orphanages in Indonesia, using the technopreneurship approach. The technopreneurship steps that we used in this study started with collecting data through a questionnaire to know the willingness of Indonesian to donate and their preferences in donating their used smartphones. We found that 78.7% of the respondents are eager to donate, and they trust the social, educational, and religious institutions as trusted, credible institutions as places for collecting used smartphones. However, the online channel is more convenient for them to donate, followed by donating through religious institutions such as mosques, churches, viharas, and temples. As a result, a business model canvas and a business process are constructed to answer the eagerness of Indonesians to donate their used smartphones.

## Introduction

The number of smartphone users in Indonesia reached 183.7 million in 2020 [1]. Indonesia is the fourth largest country in the smartphone market after China, India, and the United States. However, the usage period of a smartphone in Indonesia is relatively short, i.e., less than three years on average [2][3]. In addition, the standard practices that most people do when a smartphone reaches its end-of-use are to sell them to secondhand product traders, give them to family or relatives, pass them to people with lower social strata, or keep them at home. Very few unused smartphones are sent to recycling centers or disposed of as final disposals [4][5]. On the other hand, manufacturing a new smartphone requires energy and natural resources, including rare minerals such as columbite-tantalite. Both resources are limitedly available on our earth. Therefore, in recent decades, the circular economy has been a major initiative for reducing the exploitation of energy and natural resources by keeping materials, products, and services in circulation for as long as possible.

In the circular business model [6], one of the circularity strategies is a product life extension (PLE), where manufacturers design their products for more prolonged usage. Further, it is possible to reuse, refurbish, and remanufacture them. This model supports the implementation of a circular economy.

Previous studies showed that a refurbished smartphone is less attractive to Indonesian consumers than a new low-end smartphone [7][8]. Therefore, the better strategy to extend the product's life is direct reuse or donation. Responding to the Covid-19 pandemic, where many activities must be carried out online, including the teaching-learning process, the need for digital communication equipment has become higher. A study showed that during the pandemic, the smartphone is considered a very effective instrument of learning [9]. Most teachers use mobile phones in the online learning process, and the highest proportion of platforms used is WhatsApp [10]. In addition, smartphone-based learning can improve students' critical thinking skills. Four critical thinking skills indicators are used in this study: understanding, applying, analyzing, evaluating, and generalizing [11]. However, students in rural areas or marginalized societies have limited access to smartphones. A

study showed that the effort to extend a smartphone's life at its end-use could be coupled with the need for smartphones to support online learning through donations. A hierarchy of reuse options was proposed to bridge these two conditions [12].

The studies on smartphone donations as an initiative to implement circularity are still limited. Some studies related to donation, such as a study highlighting the reuse of digital devices, where one of the reuse options is donations [13]. Another study highlighted consumer behavior with respect to the consumption and recycling of smartphones and tablets, and one of the projects presented is Entreajudá. This project manages EEE (Electrical and Electronic Equipment) donations to be distributed to social institutions so they can be reused [14]. However, to our knowledge, no research focuses on the smartphone user's preference to donate used smartphones in supporting online learning. This study also proposes a business process for online donation that can support the implementation of circularity through PLE. This proposed online donation is developed using the Technopreneurship approach. Technopreneurship combines technology and entrepreneurship that focus on innovation through the excellent use of technology [15]. In Technopreneurship, we must not just study the technology of products and services. Still, we must learn the market to adapt the right technologies and adopt innovative strategies to meet market demand [16].

## Method

Business Model Canvas is essential as a starting point in Technopreneurship. A business model describes the rationale of how an organization creates, delivers, and captures value [17]. Business Model Canvas contains nine parts. First, we have to describe customer segments, a group of people the company wants to reach and serve. Second, we can define the value proposition of our business. The value proposition is why customers turn to one company over another. The value proposition is the benefits that a company offers to customers. Third, choosing the right channel is important cause the channel will be used to deliver the value proposition to our customers. Fourth, we need to clarify how we will maintain customer relationships. Fifth, the revenue stream represents the cash generated from each customer segment. Sixth, essential resources (physical, financial, intellectual, or human) are the most important assets to make a business model work. Seventh, key activities describe the most important things a company must do to run the business. Eighth, key partnerships describe the partner we need to run our business. Finally, cost structure describes all costs incurred to run the business. The research methodology consists of studying Indonesian consumers' behavior [18] toward used smartphones, the consumer's preferences for donating used goods, especially smartphones, and then constructing a questionnaire and collecting data. We then constructed the Business Model Canvas [17], Business process [19], and the Document Flow Diagram [20] of the proposed business model of smartphone donation for education.

## Result and Discussion

The data were collected through online questionnaires on social media such as Facebook, Instagram, Line, and WhatsApp. In total there are 216 respondents participated in this survey. Table 1 exhibits the respondent's profile.

**Table 1.** Respondent's profile

Gender		Education	
Man	50.0%	High school	52.8%
Woman	50.0%	Undergraduate	39.4%
Age		Graduate	7.4%
< 21	32.9%	Occupation	
21-32	49.5%	Students	63.9%
31-40	4.6%	Employee	36.1%
>40	13.9%	Allowance (in Rp 1,000)	
Domicile		< 5,000	51.9%

Java	81.9%	$\geq 5,000$	48.1%
Outside Java	18.1%		

Most respondents use a mid-range smartphone (44.4%), 26.4% use a high-end smartphone, 27.3% use a low-end smartphone, and only 0.9% have a second-hand smartphone. The tabulate between the first time they have a smartphone and their age is presented in Table 2. It is evident that the youngest respondent, the earliest age, already have their smartphones.

The respondents (42.1%) used their smartphones for 3-4 years before they changed to the new ones, 35.2% used them for 1-2 years, 19% for four years, and only 3.4% used their smartphones for less than one year before they change to the new ones. The top three reasons they change their smartphones are damage (52.8%), obsolete (27.3%), and want to update the smartphone (13%). Additionally, they keep their old smartphone (39.4%), give the phones to their family members or relatives (33.3%), sell used phones (24.1%), and only 3.2% donate their used smartphones.

**Table 2.** Tabulated between the first time having a personal smartphone vs respondent age

First time having a personal smartphone	Respondent's age				Total
	<21	21 – 30	31 – 40	>40	
<7 years	4	6			10
7-12 years	42	45			87
13-15 years	23	37	1		61
16-18 years		15	4		19
19-22 years		3	1	3	7
$\geq 23$ years		1	4	27	32
Total	69	107	10	30	216

### *The willingness to donate*

The respondents (78.7%) are eager to donate their used smartphones to Indonesian students in remote areas. The choice of donation institution is not a matter for 38% of them. Additionally, the donated smartphones are useable, even though the version is obsolete or with minor damage. Most are willing to donate low-end smartphones (48.1%), and mid-range used smartphones (26.4%). Table 3 exhibits respondents' preferences in donating their used smartphones.

**Table 3.** Preferences in donating a smartphone

Donation institution		The donated smartphone type	
Social	18.5%	Low-end	48.1%
Religion	13.0%	Mid-range	26.4%
Education	15.7%	Second-hand	17.6%
Online	14.8%	Refurbished	5.1%
Any institution	38.0%	High-end	2.8%
The donated smartphone performance		Type of damage in the donated smartphone	
In good performance but the version is obsolete	53.7%	No damage	53.5%
Slow performance	10.2%	Slow down	36.0%
Smartphone with minor damage	33.8%	Scratched screen	7.0%
Smartphone not sellable	0.5%	Broken speaker	2.6%
Smartphone is no longer needed	1.9%		

### *Information*

The donation recipients' information is essential for 76.9% of respondents. Transparency in the documentation, data on the donation recipients, and financial and donation reports are crucial for the potential respondent. Anonymous donators are preferable by 60.6% of respondents in this survey. Moreover, the social institution is trusted as a credible institution, then the educational institution and the religious institution. However, the online channel is more convenient for them to donate, followed by donating through religious institutions such as mosques, churches, viharas, and temples.

According to half of the respondents, schools and social institutions are also convenient channels to donate used smartphones. The donation information will attract more donors if it is shared via social media rather than the website. The donors prefer if a safety donation drop kiosk follows a pick-up facility in public facilities such as railway stations, airports, and malls.

### Business Model Canvas

Business Model Canvas (BMC) is a framework for defining the business model of a startup business. BMC can be used for all lines of business without being limited to the business sector. BMC can help the process of analyzing business strengths and weaknesses. The BMC of online donation institutions can be seen in Fig 1.

<b>Business Model Canvas</b>		Designed for: Smartphone donation institution	Designed by: Jessie	Date: 3-Nov-21	Version: 1
<b>Key Partners</b>	<b>Key Activities</b>	<b>Value Propositions</b>	<b>Customer Relationships</b>	<b>Customer Segments</b>	
-Smartphone Component Store -Freight Forwarding  -Social Institutions, Religious Institutions and Educational Institutions	-Donation activity campaign -Smartphone and fund raising -Smartphone repairing -Smartphone distribution  -Advertising  <b>Key Resources</b> -Office -Operational vehicle -Laptop/computer -Service machine/tools -Website & Internet -Human resource -Capital (money)	Support the sustainability through reuse of refurbished/second smartphones (for donor, recipient, and advertiser)  Transparency of the donation process with the facility of tracking the position of the donation item (for donor)  Helping students in the remote areas in Indonesia by providing devices for learning media (for recipients)	Sending email regarding news of the donation program/bulletin and giving donation certificates (for donor)  Contacting and visiting the donation recipient for direct socialization of donation activities (for recipient)  Sending email regarding the advertising progress and agreement (for advertiser)  <b>Channels</b> - Campaigns on TV, radio, social media, etc	1.Donor (individual, company, institution) 2.Donation recipient 3.Advertiser	
<b>Cost Structure</b> -Office rent expense -Domain rental fee -Marketing expense -Operational expense (employee salary, transportation cost, administration cost)		<b>Revenue Streams</b> -Donation from fixed donor -Advertising revenue			

**Figure 1.** Business Model Canvas of Donation Institution

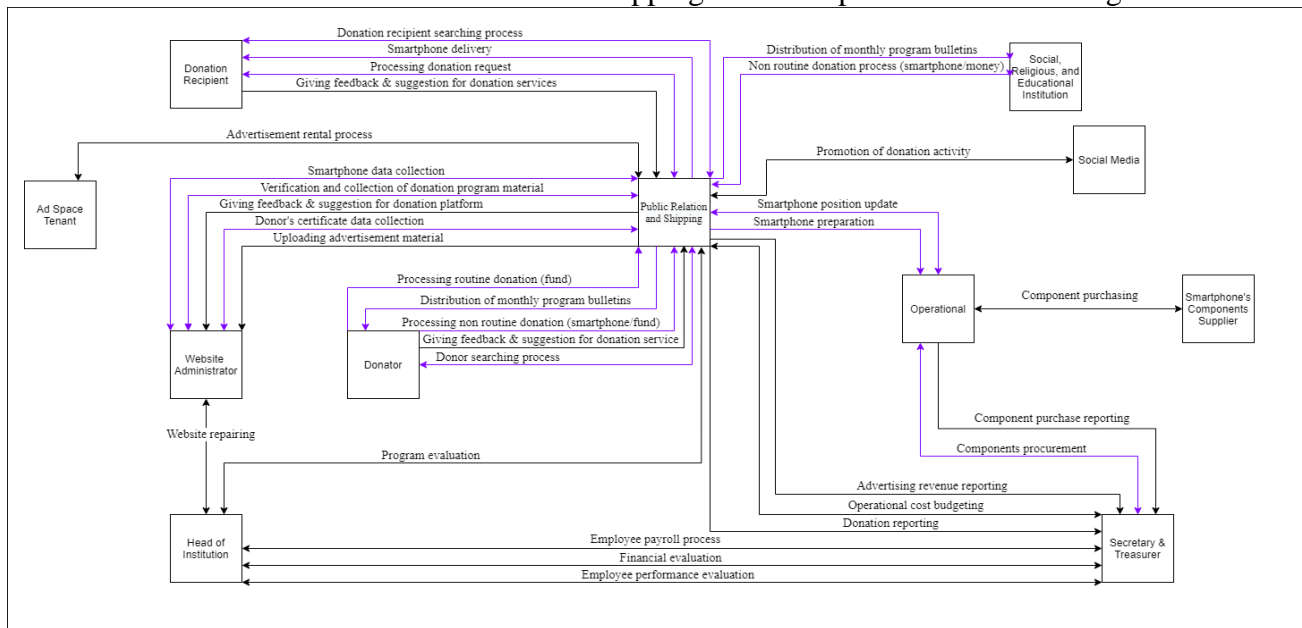
The focus of BMC in this study is based on the donor's preferences gathered from previous questionnaires. The target market of online donation institutions is donors, recipients of donations, and advertisers. The value proposition offered by the institution is supporting sustainability through the reuse of refurbished/second smartphones, giving transparency to the donation process with the facility of tracking the position of the donation item, and helping students in remote areas or the needed ones by providing devices for learning media. This online donation institution can be accessed through the official institution website, television and radio campaigns, and social media. The customer relationship is carried out by providing bulletins about the institution's program and donation certificates for donors. This institution's income comes from advertising revenue and regular donors (company, institution). The donations from regular donors will later be used for the institution's operational activities. Operational costs contain employee salaries, transportation costs, administrative costs, and the cost of purchasing components for the smartphone repair process.

The critical resource needed by this institution is an office located on Java, a motorbike as an operational vehicle, a laptop/computer to do administration and management, the internet, human resources, and money capital. Critical resources will be used for all key activities starting from the donation campaign, collecting donations and funds, repairing, and completing the needs (charges and headsets) for donated smartphones, then distributing donation smartphones to recipients and placing advertisements. The critical partnerships from this institution are smartphone component stores as sellers of smartphone components and equipment, expedition services to deliver donated smartphones outside the city, and religious institutions and educational institutions to collect donated smartphones from donors. Then the cost structure or costs that need to be incurred in running this

institution are office rental fees, employee salary rental costs, domain rental fees, activity promotion costs, and other operational costs.

### Business Process

This business process contains two activities, which are main donation activities (purple arrows) and supporting donation activities (black arrows). The main donation activities begin with finding donation recipients. Public Relations and Shipping will handle donation requests, verification, and acceptance. This division is also responsible for making donation programs and giving them to the Website Administrator. Public Relations and Shipping is also responsible for searching for a donor.



**Figure 2.** Business process of donation institution

They will create a bulletin containing donation activities and criteria that will be sent to prospective donors, social institutions, religious institutions, and educational institutions. There are two types of donations. The first is a regular donation in the form of funds for the operational cost of the donation institution. Second, a non-routine donation in the form of a smartphone or fund. Donors can also donate to social, religious, and educational institutions collaborating with this institution. Donation institution also provides a pick-up facility where donors can ask the institution to pick up the donated smartphone without additional costs. Donations will be received by Public Relations and Shipping division and then will be forwarded to the Operational division.

The operational division will check and repair the smartphone. In addition, they will procure some smartphone components and complementary devices (chargers or headsets) if necessary. Note that smartphones can be donated with the following criteria:

- They can be connected to the internet.
- They can access Zoom, Google Meet, and Google Classroom.
- They have a good speaker and microphone condition.

Operational and Public Relations and Shipping divisions are responsible for updating the smartphone's condition and position during the preparation and delivery. This news will be submitted to the Website Administrator to be uploaded to the website. A donor certificate will also be submitted to the Website Administrator by Public Relations and Shipping. Donors who have registered on the website can directly access the certificate while seeing the position of the smartphone and all documentation that has already been uploaded.

In supporting donation activities, Public Relations and Shipping will ask the donors and recipients to give feedback and suggestions about donation services. There are two types of feedback. The first is feedback about the donation process service itself, and the second is about the donation platform. Feedback about the platform will be forwarded to the Website Administrator department for website

improvements. Another supporting activity is advertising rental. This activity's objective is to support the institution's operational cost. The one who is responsible for this activity is the Public Relations and Shipping division. The advertising material will be given to the Website Administrator. Meanwhile, the advertising revenue will be reported to the Secretary and Treasurer. Secretary and Treasurer will also be responsible for the institution's financial evaluation, employee payment, and performance evaluation (see Fig 2).

## Summary

The proposed business model accommodated the eagerness of Indonesian to donate their used smartphone to Indonesian students in remote areas and the needed ones, such as in Indonesian orphanages. The potential donators need transparency in the documentation and reports. Moreover, the social institution is trusted as a credible institution, then educational and religious institutions. The last two trusted institutions differ from other worldwide smartphone donation channels, which have mode social institutions as the channel for donating used smartphones [21]. Additional to the proposed business model canvas, this paper also proposed a business process for the donation institution.

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