

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 students 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 Indonesians 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, online channels are more convenient for them to donate, followed by donations 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.

Keywords: technopreneurship; donation; business model canvas; business process

Abstrak

Penelitian ini mengusulkan donasi smartphone untuk membantu pelajar Indonesia di daerah terpencil dan pelajar yang membutuhkan bantuan, seperti pelajar di panti asuhan di Indonesia, dengan menggunakan pendekatan technopreneurship. Langkah-langkah technopreneurship yang kami gunakan dalam penelitian ini dimulai dengan mengumpulkan data melalui kuesioner untuk mengetahui kesediaan masyarakat Indonesia untuk berdonasi dan preferensi mereka dalam mendonasikan smartphone bekas mereka. Kami menemukan bahwa 78,7% dari responden sangat ingin berdonasi, dan mereka mempercayai lembaga-lembaga sosial, pendidikan, dan keagamaan sebagai lembaga yang terpercaya dan kredibel sebagai tempat pengumpulan smartphone bekas. Namun, saluran online lebih nyaman bagi mereka untuk berdonasi, diikuti oleh donasi melalui lembaga keagamaan seperti masjid, gereja, vihara, dan kuil. Hasilnya, sebuah kanvas model bisnis dan proses bisnis dibangun untuk menjawab keinginan masyarakat Indonesia untuk mendonasikan smartphone bekas mereka.

Kata kunci: kewirausahaan teknologi; donasi; kanvas model bisnis; proses bisnis

1. Introduction

The number of smartphone users in Indonesia reached 183.7 million in the year 2020 [1]. Currently, 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. In addition, the standard practices that most people do when a smartphone reaches its end-of-use are to sell it to secondhand product traders, give it to family or relatives, pass it to people with lower social strata, or keep it at home. Very few unused smartphones are sent to recycling centers or disposed of as final disposals. On the other hand, the manufacturing of a new smartphone requires energy and natural resources, including rare minerals such as columbite-tantalite. Both resources are limited and 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 0, one of the circularity strategies is a product life extension (PLE), where manufacturers design their products so that they have a longer usage time. 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 not too attractive for Indonesian consumers compared to a new low-end smartphone 00. Therefore, the better strategy to extend a product's life is direct reuse or donation. In response 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 a pandemic, the smartphone is considered a very effective instrument of learning 0. Most teachers use mobile phones in the online learning process, and the highest proportion of platforms used is WhatsApp 0. In addition, smartphone-based learning can improve students' critical thinking skills. There are four essential skills of thinking indicators used in this study: understanding, applying, analyzing, evaluating, and generalizing 0. 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-of-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 0.

The studies on smartphone donations as an initiative to implement circularity is still limited. There are studies related to donation, such as a study that highlighted the reuse of digital devices where one of the reuse options is donations 0. Another study highlighted consumer behavior with respect to the consumption and recycling of smartphones and tablets, and one of the projects presented is Entreajudada. This project manages EEE (Electrical and Electronic Equipment) donations to be distributed to social institutions so that they can be reused 0. However, to the best of 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 adopt the right technologies and adopt innovative strategies to meet market demand [16].

2. Methods

Business Model Canvas is important 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 the reason 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, key resources (physical, financial, intellectual, or human) are the most important assets required to make a business model work. Seventh, key activities describe the most important things a company must do to run the business. Eight, key partnerships describe the

partner we need to run our business. And finally, cost structure describes all costs incurred to run the business. The research methodology consists of studying Indonesian consumer's behavior [18] toward used smartphones, and the consumer's preferences for donating used goods, especially smartphones, and then constructing a questionnaire and collecting data using the questionnaire. We then built the Business Model Canvas 0, Business Process [19], and the Document Flow Diagram [20] of the proposed business model of smartphone donation for education.

3. Results and Discussion

The data were collected through online questionnaires shared 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. Most of the respondents use mid-range smartphones (44.4%), 26.4% use high-end smartphones, 27.3% use low-end smartphones, and only 0.9% have second-hand smartphones. The tabulated between the first time they have a smartphone, and their age is presented in Table 2. The youngest respondent, at 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 4 years, and only 3.4% used their smartphones for less than 1 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 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%	>= 5,000	48.1%
Outside Java	18.1%		

Table 2. Tabulated between the first time having a personal smartphone vs the respondent's 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
>=23 years		1	4	27	32
Total	69	107	10	30	216

3.1. The willingness to donate

The respondents (78.7%) are eager to donate their used smartphone for the 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 of them are willing to donate low-end smartphone (48.1%) and mid-range used smartphone (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%		

3.2. Information

Having the information of the donation recipients is important for the 76.9% of respondents. Transparency in the documentation, data of the donation recipients, and financial and donation reports is crucial for the potential respondent. Incognito donators are preferred by 60.6% of respondents in this survey. Moreover, the social institution is trusted as a credible institution, then the education institution and the religious institution. However, online channels are more convenient for them to donate, followed by donations through religious institutions such as mosques, churches, viharas, and temples. Schools and social institutions are also convenient channels to donate used smartphones, according to half of the respondents. The donation information will attract more donors if it is shared via social media rather than via the website. The donators prefer if a safety donation drop kiosk follows a pick-up facility in public facilities such as railway stations, airports, and malls.

3.3. 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.

Business Model Canvas		Designed for: Smartphone donation institution	Designed by: Jessie	Date: 3-Nov-21	Version: 1
Key Partners -Smartphone Component Store -Freight Forwarding -Social Institutions, Religious Institutions and Educational Institutions	Key Activities -Donation activity campaign -Smartphone and fund raising -Smartphone repairing -Smartphone distribution -Advertising Key Resources -Office -Operational vehicle -Laptop/computer -Service machine/tools -Website & Internet -Human resource -Capital (money)	Value Propositions 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)	Customer Relationships 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)	Customer Segments 1.Donor (individual, company, institution) 2.Donation recipient 3.Advertiser	Channels - Campaigns on TV, radio, social media, etc
Cost Structure -Office rent expense -Domain rental fee -Marketing expense -Operational expense (employee salary, transportation cost, administration cost)		Revenue Streams -Donation from fixed donor -Advertising revenue			

Figure 1. Business Model Canvas of Donation Institution

Focus of BMC in this study is based on the donor's preferences gathered from previous questionnaires. Target market of online donation institutions are 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 official institution websites, 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 include 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. Key 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, and 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.

3.4. 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 then giving them to Website Administrator. Public Relations and Shipping is also responsible for searching for a donor.

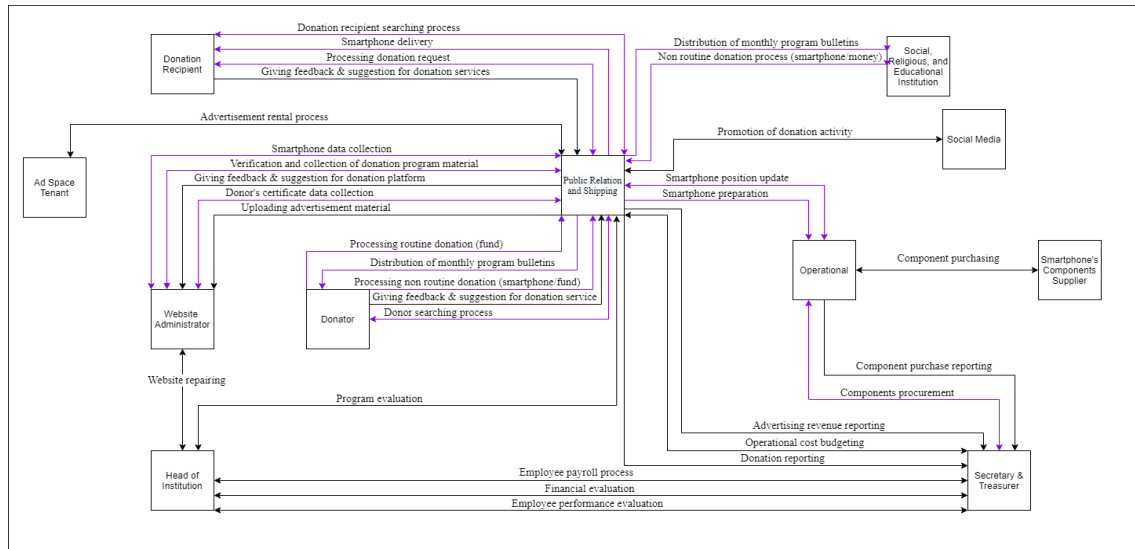


Figure 2. Business process of donation institution

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 routine 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. The Public Relations and Shipping division will receive donations 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; and 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 process. This news will be submitted to the Website Administrator to be uploaded to the website. A donor certificate will also be forwarded 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 on the website.

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 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. The secretary and Treasurer will also be responsible for the institution's financial evaluation, employee payment, and employee performance evaluation (see Fig 2).

4. Conclusion

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

References

- Statista, 2021. Number of smartphone users in Indonesia from 2017 to 2020 with forecasts until 2026. <https://www.statista.com/statistics/266729/smartphone-users-in-indonesia/> (accessed on 25 September 2022)
- H. Maheswari, G. Yudoko and A. Adhiutama A. Stakeholder engagement in quattro helix model for mobile phone reverse logistics in Indonesia: A conceptual framework. In IOP Conference Series: Materials Science and Engineering, 277:1, (2017 December), p. 012062. IOP Publishing
- A.Q. Mairizal, A.Y. Sembada, K.M. Tse, and M.A. Rhamdhani. Electronic waste generation, economic values, distribution map, and possible recycling system in Indonesia. *Journal of Cleaner Production*, 293 (2021), 126096
- R. Siringo, H. Herdiansyah, and R.D. Kusumastuti. Underlying factors behind the low participation rate in electronic waste recycling. *Global Journal of Environmental Science and Management*, 6:2, (2020) 203-214.
- P. Andarani, and N. Goto. Potential e-waste generated from households in Indonesia using material flow analysis. *Journal of Material Cycles and Waste Management*, 16:2 (2014) 306-320.
- A. Atasu, C. Dumas, and L.N. van Wassenhove. The circular business models. *Harvard Business Review*, 99:4 (2021), 72-81
- S. Halim, S.S Gan and J.M. Oentoro. Identifying factors that influence customers' interest in buying refurbished smartphones: An Indonesian context. *Asia-Pacific Journal of Science and Technology*, 27:4 (2022), APST-27. <https://doi.org/10.14456/apst.2022.63>
- S.S. Gan, A. Halim, and D.S. Anggraini. Hierarchy of Reuse Options in Smartphone Selection and Strategies to Support Circular Economy. Presented at the 2nd International Conference on Science, Engineering, and Technology (ICSET 2022) on July 6th, 2022. <https://sites.google.com/unimap.edu.my/icset2022>
- F.B. Sole, and D.M. Anggraeni. Effectiveness of the use of smartphone communication technology as mobile-based learning media for STKIP Weetebula students in the Covid-19 pandemic period. In *International Joint Conference on Arts and Humanities (IJCAH 2020)* (pp. 338-343). Atlantis Press.
- H. Zaini, A. Hadi, F.A. Sofyan and A. Hamzah A. Covid-19 and Islamic education in school: Searching for alternative learning media. *Webology*, 18:1(2021), 154-165.
- A. Sa'diyah, I. Wilujeng and N. Nadhiroh, March. The Effect of Using Smartphone-Based Learning Media to Improve Students' Critical Thinking Skills During Covid-19 Pandemic. In *6th International Seminar on Science Education (ISSE 2020)* (pp. 374-379). Atlantis Press.

- S.S Gan and S. Halim. Hierarchy of End-of-use Options: Smartphones Reuse to Support Online Learning During COVID-19 Pandemic in Indonesia. Presented at the 4th International Conference on Logistics and Supply Chain Management (IC-LSCM, 2021) on October 2nd, 2021. <https://mconf-fti.petra.ac.id/>
- D. Franquesa, L. Navarro and X. Bustamante. A circular common for digital devices: Tools and services in reuse. In Proceedings of the Second Workshop on Computing within Limits (2016 June) pp. 1-9.
- G. Martinho, D. Magalhães, and A. Pires A. Consumer behaviour with respect to the consumption and recycling of smartphones and tablets: An exploratory study in Portugal. *Journal of Cleaner Production*, 156 (2017) 147-158
- A. Jubilo, *The Explainer: Technopreneurship*, Lulu.com (2018).
- Okorie N.N, Kwa D.Y., Olusunle S.O.O., Akinyanmi A.O., and Momoh I.M. Technopreneurship: An Urgent Need in the Material World for Sustainability in Nigeria. *European Scientific Journal*, 10:30 (2014) 59-73
- A. Osterwalder and Y. Pigneur, *Business Model Generation* (2nd ed.), Modderman Druckwerk (2010).
- P. Kotler, *Marketing Management*. Edisi Milenium, Prentice Hall Intl, Inc New Jersey (2000).
- M. Weske, *Business Process Management*, Springer (2007)
- S. Senft and F. Gallegos, *Information Technology Control and Audit* (3rd ed.), CRC Press (2008).
- C. Johnson, 20 Ways to Donate Old Cell Phones, <https://clark.com/cell-phones/donate-old-cell-phones> (accessed on 25 September 2022). Summary