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# 1 Cashless Tapping Behavior: Customer Decision-Making Process of Chip-Based Electronic Money in Indonesia

*International Conference on Emerging Challenges: Smart Business and Digital Economy*

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## 1 Abstract

*Electronic payments offer secure and convenient fund access, reducing cash and check reliance for merchants and attracting wider customer bases. Non-cash transactions surge, outpacing cash. An electronic money chip securely stores values on a chip or server. This research examines factors driving electronic money development in Indonesia, focusing on chip-based systems. Using the Customer Decision Making Process, consumer behavior in selecting and using electronic money is analyzed. This study deeply explores consumer decision-making behavior in chip-based electronic money usage in Indonesia. Electronic payments replace cash and checks for merchants, drawing more customers. Non-cash transactions grow, propelled by the electronic money chip securely storing values on chips or servers. The core aim is to understand factors driving electronic money growth in Indonesia, with a chip-based focus. The Customer Decision Making Process framework uncovers consumer behavior in electronic money selection and use, aligned with individual needs. Through problem recognition, information search, alternative evaluation, purchase decision, and post-purchase behavior, this research unveils motivations shaping the digital financial landscape.*

### **Research purpose:**

*The primary aim of this study is to probe into the consumer decision-making process prevalent in the usage of chip-based electronic money in Indonesia. By comprehending the factors driving consumer choices, their attitudes towards this payment mode, and the holistic decision-making trajectory, this research seeks to illuminate the complex web that guides consumer behavior in this context.*

### **Research motivation:**

*The impetus behind this research springs from the burgeoning growth of chip-based electronic money adoption in Indonesia. As this mode of payment gains increasing prominence, a comprehensive understanding of how consumers traverse their decision-making journey holds immense significance for businesses and policymakers alike. By delving into the factors influencing consumer choices and perceptions, this study endeavors to offer insights that can refine electronic money services, shape marketing strategies, and contribute to a deeper comprehension of consumer conduct within the realm of contemporary digital transactions.*

### **Research design, approach, and method:**

*Employing a quantitative approach, this study utilizes primary data garnered through questionnaires distributed among chip-based electronic money users. The sampling methodology involves a non-probability technique, specifically purposive sampling, chosen to ensure a deliberate and representative selection of participants. As the research proceeds, the intricate interplay of factors that shape consumer decisions, attitudes, and behaviors in the realm of chip-based electronic money will be unveiled. Crosstabulation, Chi-Square analysis, and Descriptive statistic are presented to answer the research questions.*

### **Main findings:**

*Through an extensive exploration of the consumer decision-making process surrounding chip-based electronic money utilization, several key findings have emerged, shedding light on the multifaceted factors influencing user choices and behaviors within the realm of digital financial transactions. Firstly, there is a shared awareness among users across all electronic money chip-based types about the crucial role electronic money chips play in modern transactions, highlighting a paradigm shift towards the recognition of their significance. Secondly, diverse information-seeking behaviors prevail, with users engaging with online platforms and recommendations, underscoring the importance of tailored information dissemination. Moreover, users exhibit a discerning approach during alternative evaluation, considering factors like usability, pricing, and institutional trust, reflecting a nuanced decision making process. Purchase*

decisions are notably driven by specific product attributes, such as NFC top-up convenience, aesthetics, accessibility, and affordability. Importantly, post-purchase behavior reveals a continuous cycle of evaluation as users scrutinize electronic money chip based' utility, promotions, discounts, and admin fees. Collectively, these findings provide insights crucial for businesses and policymakers, informing strategies that align with evolving user expectations and contributing to the evolution of electronic money adoption in Indonesia's digital financial landscape.

**Practical/managerial implications:**

The research offers actionable insights for businesses, financial institutions, and policymakers in the field of electronic money adoption. Tailored marketing strategies, innovative product attributes, and trust-building measures can enhance adoption. Sustained engagement strategies and collaborations with digital platforms are essential for post-purchase engagement. Policymakers can use the insights to formulate regulations for secure electronic money environments. Embracing continuous innovation ensures relevance. Integrating these implications can lead to increased adoption, enriched experiences, and a robust electronic money ecosystem in Indonesia.

**Keywords:** Consumer Behavior, e-money, cashless, e-payment, tapmoney

**1. INTRODUCTION**

Bank Indonesia (BI) announced the National Non-Cash Movement (GNNT) on 14 August 2014 with the aim of creating a safe, efficient and smooth payment system. This movement aims to support the performance of the national financial system so that it runs effectively and efficiently. GNNT is also expected to be able to reduce obstacles in paying with cash, such as money that is damaged, torn, or unfit for circulation, as well as increasing transaction efficiency so that people do not need to carry large amounts of cash. Thus, GNNT can increase the effectiveness of transactions and avoid miscalculations or human errors. In the end, GNNT will encourage the realization of a cashless society.

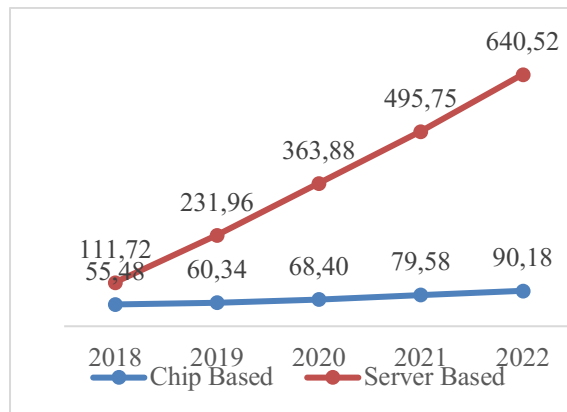


Fig. 1 The development of electronic money in Indonesia from 2017 - 2022

According to data provided by Bank Indonesia in the year 2021, a notable and favorable upward trajectory in both transaction volume and transaction value can be observed spanning the period from 2017 to 2021. Notably, the aggregate count of electronic monetary chip based in circulation within Indonesia surged to a magnitude of 575 million chip-based units, reflecting an impressive escalation of 75% over the year-on-year interval from December 2020 to December 2021. Concurrently, the monetary value of transactions facilitated by the electronic monetary chip-based sector exhibited a corresponding increment, reaching an approximate sum of Rp. 786 trillion. This particular value escalation translates to a substantial growth of 64% during the same year-on-year period from December 2020 to December 2021.

Electronic money chip based on the scope of implementation consist of closed loop and open loop. Electronic cash chip based is closed loop, namely electronic money that can only be used as a payment instrument to a Goods and/or Service Provider who is an Issuer of said Electronic Money, meanwhile an electronic money chip based open loop, namely electronic money that can be used as a payment instrument to Goods and/or Service Providers who are not issuers of said electronic money. Based on the storage media, electronic money chip based are divided into server based and chip based, server based namely electronic money with storage media in the form of servers, chip based is electronic money with a chip as a storage medium. Based on the recording of the user's identity consisting of unregistered and registered. Electronic money chip based unregistered is an electronic money chip based whose user identity data is not registered and not recorded at the issuer. Electronic money chip based registered is electronic money whose user identity data is registered and registered with the Issuer. According to Bank Indonesia in 2021 there are 18 financial institutions and 45

non-bank institutions issuing electronic money chip based

The proliferation of electronic money chip based within Indonesia has showcased a compelling narrative of growth and transformation in the financial landscape. As these chips based become increasingly integrated into daily transactions, an intriguing challenge arises: understanding the intricate web of factors that shape customers' decisions to embrace and engage with electronic money chip based. This study seeks to untangle the multifaceted influences—ranging from socio-cultural norms and technological readiness to perceptions of security and regulatory environments—that impact the choices consumers make regarding electronic money chip based. By delving into this intricate tapestry of customer decision-making, the research endeavors to shed light on pivotal touchpoints for businesses, policymakers, and industry stakeholders, ultimately contributing to the optimization of strategies aimed at fostering wider adoption and sustainable usage of electronic money chip based in Indonesia's dynamic financial ecosystem.

## 2. LITERATURE REVIEW AND HYPOTHESIS DEVELOPMENT

### 2.1 Electronic Chip based Chip Based

According to the Bank Indonesia (2020), innovations in electronic payment instruments using chip based have developed into more practical forms. Currently in Indonesia is developing a payment instrument known as electronic money. Even though it contains slightly different characteristics from other payment instruments such as credit chip based and ATM/Debit chip based, the use of these instruments remains the same as credit chip based and ATM/Debit chip based, which are intended for payment.

In simple terms, electronic money is defined as a payment method that uses an electronic form, where the value of the money is stored in an electronic form of media. Users have to deposit money to publisher advance and store it in electronic media before being able to use it to make transactions. electronic money (*electronic money*) is a means of payment that meets the following elements (Bank Indonesia, 2020):

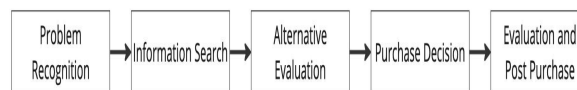
- Published on the basis of the value of money paid in advance to the publisher;
- Value of money is stored electronically in a medium such as *server* or *chip*; and
- The value of electronic money managed by the issuer is not a deposit as referred to in the law that regulates banking.

Electronic Money *Chip Based* is the amount of electronic money that uses a form of data storage media *chip* as a storage medium for the value of electronic money at the end of the reporting period. Electronic Money *Server Based* is the amount of electronic money that uses data storage media in the form of *server* or other computer media managed by the issuer as a storage medium for electronic money values at the end of the reporting period (Zandi, et., 2016),.

### 2.2 Customer Decision Making Process

There are two factors that influence purchases made by consumers, namely internal factors and external factors. However, besides these factors, there are also individual behaviors that reflect a person's self-confidence and lifestyle, which influence the buying process and consumer behavior in decision making. Therefore, it is important to consider carefully before making a purchase because the main goal is to get satisfaction.

In addition to the factors previously mentioned, the buying process is also influenced by the decision-making process which is influenced by the situation being faced by consumers at that time. *Customer decision making process* is a process by which consumers evaluate the attributes of a set of brands or services before deciding to buy or use them (Mothersbaugh & Hawkins, 2016). The following is an overview of the sequence of decision making by consumers.



**Fig. 2** Consumer Decision Making Process

Source: Mothersbaugh dan Hawkins (2016)

#### A. Problem recognition

The buying process begins when consumers are aware of a problem or need that arises from internal factors that encourage them to immediately fulfill these needs, such as feeling thirsty or hungry. In addition, the buying process can also be influenced by external factors, such as seeing advertisements that encourage consumers to buy. Therefore, marketers must conduct research first to find out the needs or problems that arise from consumers, the causal factors that trigger these needs or problems, and how consumers can obtain the products offered.

#### B. Information Search

Once consumers feel that they need to buy a product or service, they will start looking for information about that product. However, if the urge to buy the product is very strong or if they are already satisfied with the product, they are unlikely to seek further information before purchasing. Consumers can also save their needs in memory and perform information searches related to these needs.

### C. *Alternative Evaluation and Selection*

Once consumers have gathered information, they will evaluate the available options from their individual perspective. Each consumer has a different preference for various factors such as perceived value, brand, price, speed of service, and social consequences. It is very important for companies to understand their consumer preferences so that they can assist consumers in evaluating available product alternatives.

### D. *Purchase Decision*

Purchasing is the last stage in the consumer decision-making process. At this stage, the consumer makes a decision about what to buy. If consumers have used a product before, they will likely decide to purchase it again in the future, and will skip straight to this stage. There are two factors that influence purchasing decisions, namely the intention to buy (*purchase intention*) and the decision to buy (*purchase decision*). The first factor that influences is the attitude of other people towards the product. If important people to consumers suggest buying a cheaper product, then the desire to buy a more expensive product will decrease. The second factor is unforeseen situational factors, such as changes in price, income, or previously desired product benefits.

### E. *Post Purchase Behavior*

After consumers buy a product, they may feel disappointed with certain features that did not match their initial expectations. However, consumers may also hear positive comments about similar brands, which can shake their confidence in a recently purchased product. The consumer's feelings of satisfaction or dissatisfaction will then influence post-purchase behavior. *Post purchase processes* will be determined by consumer perceptions and expectations of product performance. The greater the negative difference between perception and performance, the greater the consumer's dissatisfaction. Therefore, marketers need to strengthen consumer choices and make them feel comfortable with certain brands by promising only products that meet specifications, so that consumers do not have too high expectations and are satisfied with the products purchased.

## 3. METHODOLOGY

### 3.1 Type of Research

This study employs a conclusive research design to comprehensively investigate the customer decision-making process regarding chip-based electronic money chip based in Indonesia. A cross-sectional survey approach will be utilized to collect primary data through a structured questionnaire. The primary objective is to understand the factors influencing customers' decisions to adopt and use chip-based electronic money chip based in Indonesia, providing insights into the decision-making journey.

### 3.2 Sampling and Data Collection

The population is an area consisting of objects or subjects that have certain characteristics and qualities determined by researchers to be studied and then the results will be drawn conclusions (Malhotra, 2017). The population of this research is the number of electronic money users in Indonesia. In 2022, the number of electronic money users in Indonesia will reach 575,320,000 users. Jaya (2020) defines a sample as a part that is considered to represent a portion of the population of respondents to be studied. If seen from the Krejcie Morgan table in when calculating the size of the sample, there will be a 5% error probability. Where the remaining 95% is the confidence level for the related population being sampled. So if you look at the research, from a population of 575,320,000 users, the minimum number of samples obtained is 385 samples.

## 4. RESULT AND DISCUSSION

### 4.1 Respondents Profile

In accordance with research methodology, the Krejcie and Morgan table was employed to determine the optimal sample size, maintaining a 5% error probability and a 95% confidence level, with respect to the population of 575,320,000 users. The calculated minimum sample size stood at 385 respondents. However, the study encountered a limitation as the actual number of respondents amounted to 196, falling short of the anticipated sample size. This disparity can be attributed to practical constraints, including response rates, accessibility, and potential demographic limitations.

While the obtained sample size is less than ideal, the research enriches the understanding of consumer behaviors pertinent to chip-based electronic money. It also highlights the potential for future investigations to validate these insights across larger and more diverse samples, thus contributing to the advancement of knowledge in this domain. There are 196 respondents for analysis *Customer Decision Making Process*. Pre-screening for questions includes age, address, occupation, monthly expenses, type of electronic money chip based used and expenses for reloading electronic money chip based

**Table 1.** Respondents Profile

Parameter	Item	Frequency	Percentage
Age	17 - 20 Years	17	8,67%
	21 - 27 Years	124	63,27%
	> 27 Years	55	28,06%
	Total	196	100,00%
Domiciles	Banten	19	9,69%
	DKI Jakarta	112	57,14%
	Jawa Barat	41	20,92%
	Jawa Timur	7	3,57%
	Sulawesi Selatan	4	2,04%
	Sulawesi Utara	2	1,02%
	Others	11	5,61%
	Totalq	196	100,00%
Occupation	Doctor	5	2,55%
	Freelancer	13	6,63%
	Employee	107	54,59%
	Civil Servant	10	5,10%
	Student	49	25,00%
	Enterpreneur	8	4,08%
	Others	4	2,04%
	Total	196	100,00%

The presented data represents the outcomes of a comprehensive survey conducted among users of chip-based electronic money chip based. The survey aimed to capture various demographic characteristics of the participants, shedding light on the profile of individuals engaging with this form of digital payment. Regarding age distribution, the survey encompassed a total of 196 participants. Of these, 17 participants (8.67%) fell within the 17 to 20 years age bracket, while a substantial majority, comprising 124 participants (63.27%), belonged to the 21 to 27 years age range. Notably, 55 participants (28.06%) were categorized as being above 27 years of age.

The survey also collected data on the domicile locations of the participants. Among the respondents, 112 individuals (57.14%) were based in DKI Jakarta, signifying a significant concentration. Other prominent locations included Jawa Barat with 41 participants (20.92%), Banten with 19 participants (9.69%), and Jawa Timur with 7 participants (3.57%). Additionally, smaller portions of the respondents were situated in Sulawesi Selatan (2.04%), Sulawesi Utara (1.02%), and various other unspecified locations (5.61%).

Furthermore, the survey explored the occupational backgrounds of the participants. Among the 196 respondents, the most prevalent occupation was that of an employee, accounting for 107 participants (54.59%). Following closely were students, constituting 49 participants (25.00%). Freelancers comprised 13 participants (6.63%), while civil servants represented 10 participants (5.10%). A smaller portion of the participants included doctors (2.55%), entrepreneurs (4.08%), and individuals in other occupations (2.04%).

**Table 2.** The Electronic Money Chip Based Used By The Respondents

Type of Electronic Money Chip Based	Frequency	Percentage
BCA Flazz	55	28%
BRIZZI	22	11%
Others	1	1%
E-money mandiri	107	55%
Tap Cash BNI	11	6%
Grand Total	196	100%

The provided data illustrates the distribution of electronic money chip based types used by the respondents. The survey encompassed a total of 196 participants, each utilizing various electronic money chip based for their transactions. Notably, the data reveals that the highest percentage of respondents, constituting 55 participants (28%), employed the BCA Flazz electronic money chip based for their transactions. E-money Mandiri emerged as another significant choice, with 107 participants (55%) favoring this particular chip based type. Additionally, 22 participants (11%) indicated their preference for BRIZZI, and 11 participants (6%) opted for Tap Cash BNI. A small percentage of respondents, representing 1 participant (1%), reported using other electronic money chip based types that were not specified in the data. This

breakdown of electronic money chip based usage among the surveyed individuals underscores the popularity of E-money Mandiri and BCA Flazz chip based, followed by BRIZZI and Tap Cash BNI, which collectively contribute to a comprehensive understanding of the prevalent electronic money chip based preferences among the respondents.

**4.2 Problem Recognition**

The buying process begins when consumers are aware of a problem or need that arises from internal factors that encourage them to immediately fulfill these needs.

**Table 3.** Problem recognition

Variable	Item	Chi Square	Flazz	Brizzi	E-money	Tapcash
Realize that electronic money chip based are needed for transactions	1	0.350	2	0	0	0
	2		0	0	1	0
	3		1	0	1	0
	4		5	4	9	2
	5		48	18	96	9
Realize that Electronic Money Chip based are a substitute for cash in cashless transactions	1	0.267	1	0	0	0
	2		1	1	1	0
	3		2	1	2	1
	4		4	4	11	3
	5		48	16	93	7
Need an Electronic Money Chip based for transactions	1	0.566	1	0	4	0
	2		4	1	5	1
	3		5	1	14	0
	4		16	4	41	5
	5		30	16	43	5
Need an Electronic Money Chip Based as a substitute for cash in a cashless transaction	1	0.878	1	0	2	0
	2		1	0	2	0
	3		7	1	11	0
	4		13	5	37	3
	5		34	16	55	8

The data provided encompasses respondents' perspectives on electronic money chip-based transactions, employing a Likert scale that measures their levels of agreement with statements. This scale ranges from "Strongly Disagree" to "Strongly Agree," and the responses are stratified by the electronic money chip based types utilized by the participants: Flazz, Brizzi, E-money, and Tapcash. The Chi-Square test is applied to evaluate whether an association exists between the respondents' chip based preferences and their responses to the statements. Delving into the results, it becomes evident that participants across all chip based types predominantly express agreement or strong agreement with statements related to recognizing the necessity of electronic money for transactions and its role as a cash substitute in cashless transactions.

***"Realize that electronic money chip-based are needed for transactions"***

This Likert scale item assesses respondents' awareness of the necessity of electronic money chip-based transactions. The responses are categorized into five levels: Strongly Disagree, Disagree, Neutral, Agree, and Strongly Agree. Looking at the data, among users of the Flazz chip based, 2 participants (approximately 3.64%) strongly disagreed, and 48 participants (87.27%) strongly agreed that electronic money is essential for transactions. Among Brizzi users, no one strongly disagreed, and 18 participants (81.82%) strongly agreed. For E-money users, 9 participants (84.11%) strongly agreed, while among Tapcash users, 2 participants (18.18%) strongly agreed. The Chi-Square values associated with these responses suggest weak associations between chip based types and participants' perceptions.

***"Realize that Electronic Money Chip-based are a substitute for cash in cashless transactions"***

This item evaluates whether respondents consider electronic money chip-based transactions as substitutes for physical cash in cashless transactions. Among Flazz users, 1 participant (1.82%) strongly disagreed, and 48 participants (87.27%) strongly agreed. Among Brizzi users, no one strongly disagreed, and 16 participants (72.72%) strongly agreed. E-money users exhibited 93 participants (86.91%) strongly agreeing, while 7 participants (65.45%) among Tapcash users strongly agreed.

***"Need an Electronic Money Chip based for transactions"***

This item explores respondents' feelings regarding the necessity of having an electronic money chip based for conducting transactions. Among Flazz users, 1 participant (1.82%) strongly disagreed, and 30 participants (54.54%) strongly agreed. Brizzi users had 16 participants (72.72%) strongly agreeing, and E-money users showed 43 participants (40.18%) strongly agreeing. Among Tapcash users, 5 participants (45.45%) strongly agreed. The Chi-Square values suggest minor associations between chip based types and participants' needs for an electronic money chip based.

***"Need an Electronic Money Chip-Based as a substitute for cash in a cashless transaction"***

This item gauges respondents' inclination towards using electronic money chip-based as a substitute for physical cash in cashless transactions. For Flazz users, 1 participant (1.82%) strongly disagreed, and 34 participants (61.81%) strongly agreed. Among Brizzi users, no one strongly disagreed, and 16 participants (72.72%) strongly agreed. E-money users indicated 55 participants (51.40%) strongly agreeing, while 8 participants (72.72%) among Tapcash users strongly agreed. Chi-Square values again indicate moderate associations between chip based types and perceptions.

### 4.3 Information Search

According to Kotler & Armstrong (2018), after consumers feel that they need to buy a product or service, they will start looking for information about the product. Based on the factors presented in the questionnaire, consumers seek CUE information through *website/internet* and *social media*. Seeking information through recommendations, and finally seeking information about Electronic Money Chip based through issuing institutions (banks and non-banks)

**Table 4. Information Search**

Variable	Item	Chi Square	Flazz	Brizzi	E-money	Tapcash
Search for information about chip-based electronic money from websites or the internet and social media	1	0.010	3	1	6	0
	2		8	0	14	0
	3		24	5	36	0
	4		11	5	29	4
	5		10	11	22	7
Search for information about Electronic	1	0.216	4	1	1	0
	2		6	1	12	0



Money chip based through recommendations	3	0.407	13	3	16	1
	4		6	3	26	4
	5		27	14	52	6
Search for information regarding Electronic Money Chip based through issuing institutions (banks and non-banks)	1	0.407	4	0	6	0
	2		7	0	14	0
	3		13	5	21	2
	4		6	4	15	4
	5		6	2	12	3

Based on data from table 4 The description describes the method used by Electronic Money Chip Based users in searching for based on:

***"Search for information about chip-based electronic money from websites or the internet and social media"***

This item measures respondents' behavior in seeking information about chip-based electronic money through online sources. The responses range from Strongly Disagree to Strongly Agree. Among Flazz users, 6 participants (10.90%) strongly agreed, while 1 participant (1.82%) strongly disagreed. Among Brizzi users, no one strongly disagreed, and 14 participants (63.63%) strongly agreed. E-money users exhibited 36 participants (33.64%) strongly agreeing, and Tapcash users showed 7 participants (63.63%) strongly agreeing. The Chi-Square values suggest weak associations between chip based types and the likelihood of using online sources for information gathering.

***"Search for information about Electronic Money chip-based through recommendations"***

This item gauges how participants acquire information about electronic money chip-based transactions through recommendations. Flazz and Brizzi users largely exhibited agreement, with 27 participants (49.09%) and 14 participants (63.63%) strongly agreeing, respectively. E-money users strongly agreed (48.14%), while Tapcash users showed moderate agreement (54.54%). The Chi-Square values indicate limited associations between chip based types and the reliance on recommendations for information.

***"Search for information regarding Electronic Money Chip based through issuing institutions (banks and non-banks)"***

This item examines respondents' inclination to gather information about electronic money chip based from the institutions that issue them. Among Flazz users, 13 participants (23.63%) strongly agreed, while 6 participants (10.90%) strongly disagreed. Brizzi and E-money users showed similar patterns, with around half of participants indicating agreement. Tapcash users exhibited mixed responses. The Chi-Square values suggest minor associations between chip based types and the preference for obtaining information from issuing institutions.

#### 4.4 Alternative Evaluation and Purchase

According to Kotler & Armstrong (2018), after consumers have gathered information, they will evaluate the available options based on their individual perspective. Each consumer has a different preference for various factors such as perceived value, brand, price, speed of service, and social consequences. Based on the factors presented in the questionnaire, creating a Electronic money list has the potential to be used. Consumers select and choose Electronic money based on product price and convenience *top up*, based on the company's reputation, what banking provides compared to other providers, which is easy to get, which can be done in many transactions *merchant/reader*, and who has *tap in tap out* the fast one.

**Table 5.** Alternative Evaluation and Purchase

Variable	Item	Chi Squa	Flaz z	Briz zi	E-mon	Tapca sh
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		re			ey	
Making a list of Electronic Money Chip based products that have the potential to be used	1	0.14 0	7	2	14	0
	2		11	0	14	0
	3		14	5	30	2
	4		11	4	25	5
	5		13	11	24	4
select and choose Electronic Money Chip based products based on product price and ease of top up	1	0.56 2	4	3	5	0
	2		4	0	8	0
	3		8	2	13	0
	4		12	4	30	5
	5		28	13	51	6
selecting and choosing Electronic Money Chip based products provided by banks compared to other providers	1	0.26 2	2	1	6	0
	2		5	0	3	0
	3		6	2	16	1
	4		11	2	29	5
	5		32	17	53	5
selecting and choosing Electronic Money Chip based products that can be made transactions at many merchants/readers	1	0.97 4	2	1	3	0
	2		1	1	2	0
	3		4	1	8	0
	4		11	4	28	4
	5		38	15	66	7
selecting and choosing Electronic Money Chip based products	1	0.82 4	2	1	1	0
	2		2	0	2	0

that have a fast tap in/tap out	3		5	2	16	0
	4		14	6	24	2
	5		33	13	64	9

Based on Data table 5 describes the evaluation process and alternative selection carried out by Electronic Money Chip based users based on *Alternative Evaluation & Selection*

***"Make a list of Electronic Money Chip based products that have the potential to be used"***

This item assesses respondents' perceptions of potential electronic money chip based usage. The responses range from identifying potential usage to a lack thereof. Across all chip based types, respondents generally indicated agreement. E-money Mandiri users showed strong agreement, with 30 participants (28.04%), followed by BCA Flazz (14 participants or 25.45%), BRIZZI (5 participants or 22.72%), and Tap Cash BNI (2 participants or 18.18%). The Chi-Square values suggest weak associations between chip based types and the perception of potential usage.

***"Select and choose Electronic Money Chip based products based on product price and ease of top-up"***

This item explores respondents' inclination to choose electronic money chip based products based on pricing and top-up convenience. Responses are generally inclined toward agreement. E-money Mandiri users showed strong agreement, with 51 participants (47.66%), followed by BCA Flazz (28 participants or 50.90%), BRIZZI (13 participants or 59.09%), and Tap Cash BNI (6 participants or 54.54%). The Chi-Square values suggest limited associations between chip based types and considerations of pricing and top-up ease.

***"Selecting and choosing Electronic Money Chip based products provided by banks compared to other providers"***

This item examines respondents' tendencies to opt for electronic money chip based products offered by banks over other providers. While variations exist, the majority within each chip based type expressed agreement. E-money Mandiri users showed strong agreement, with 53 participants (49.53%), followed by BCA Flazz (32 participants or 58.18%), BRIZZI (17 participants or 77.27%), and Tap Cash BNI (5 participants or 45.45%). The Chi-Square values suggest weak associations between chip based types and preferences for bank-provided chip based.

***"Selecting and choosing Electronic Money Chip based products that can be made transactions at many merchants/readers"***

This item assesses respondents' consideration of electronic money chip based usability across various merchants and readers. The majority within each chip based type indicated agreement. E-money Mandiri users showed strong agreement, with 66 participants (61.68%), followed by BCA Flazz (38 participants or 69.09%), BRIZZI (15 participants or 68.18%), and Tap Cash BNI (7 participants or 63.63%). The Chi-Square values suggest weak associations between chip based types and preferences for broad usability.

***"Selecting and choosing Electronic Money Chip based products that have a fast tap in/tap out"***

This item explores respondents' preferences for electronic money chip based with efficient tap in and tap out functionality. While responses vary, the majority within each chip based type showed agreement. E-money Mandiri users demonstrated strong agreement, with 64 participants (59.81%), followed by BCA Flazz (33 participants or 60.00%), BRIZZI (13 participants or 59.09%), and Tap Cash BNI (9 participants or 81.81%). The Chi-Square values suggest weak associations between chip based types and preferences for fast tap in/tap out capabilities.

#### **4.5 Purchase Decision**

According to Kotler & Armstrong (2018), purchasing is the final stage in the consumer decision-making process. At this stage, the consumer makes a decision about what to buy. If consumers have used the product before, they are likely to use it again in the future, and will skip straight to this stage.

Based on Table 6 describe the purchase decision (*Purchase Decision*) carried out by Electronic Money Chip based users based on several important factors.

***"Using Electronic Money Chip based products that can be topped up using NFC"***

This item evaluates respondents' preference for electronic money chip based products that can be recharged using Near Field Communication (NFC) technology. Among Flazz users, 20 participants (36.36%) strongly agreed, and 14 participants (25.45%) agreed. For Brizzi users, 13 participants (59.09%) strongly agreed, while among E-money users, 47 participants (43.92%) strongly agreed. The Chi-Square values suggest limited associations between chip based types and the inclination to use NFC-enabled top-ups.

**Table 6. Purchase Decision**

Variable	Item	Chi Square	Flazz	Brizzi	E-money	Tapcash
Using Electronic Money Chip based products that can be topped up using NFC	1	0.487	2	0	3	1
	2		5	2	8	0
	3		15	3	25	1
	4		14	4	24	3
	5		20	13	47	6
Using Electronic Money Chip based products that have unique and attractive designs	1	0.105	2	0	2	0
	2		1	0	10	1
	3		7	4	21	2
	4		46	18	74	8
	5		46	18	74	8
Using Electronic Money Chip based products that can be topped up at minimarkets and vending machines	1	0.443	4	2	3	0
	2		4	2	8	0
	3		7	1	20	1
	4		9	1	29	5
	5		32	16	47	5
Using the cheapest Electronic Money Chip based product	1	0.629	1	1	0	0
	2		2	0	3	0
	3		2	1	8	1
	4		14	5	18	5
	5		37	15	78	5
Using an electronic money chip based that can be used at many merchants and electronic money readers	1	0.364	4	1	2	0
	2		2	1	8	0
	3		9	1	18	3
	4		15	5	21	3
	5		26	14	58	5

***"Using Electronic Money Chip based products that have unique and attractive designs"***

This item assesses respondents' interest in electronic money chip based products with distinctive and appealing designs. While responses vary, the majority of participants across all chip based types showed agreement. Flazz, Brizzi, and E-money users indicated strong agreement (46.36%, 18.18%, and 74.01%, respectively), whereas Tapcash users demonstrated similar patterns (74.01%). Chi-Square values indicate minor associations between chip based types and preferences for unique designs.

***"Using Electronic Money Chip based products that can be topped up at minimarkets and vending machines"***

This item explores respondents' tendencies to choose electronic money chip based products that can be recharged conveniently at minimarkets and vending machines. While responses differ, the majority of participants within each chip based type showed agreement. E-money and Tapcash users exhibited strong agreement (46.83% and 47.73%, respectively). The Chi-Square values suggest weak associations between chip based types and preferences for topping up at convenient locations.

***"Using the cheapest Electronic Money Chip based product"***

This item examines whether respondents prefer the most affordable electronic money chip based products. The data indicates varied responses, with the majority within each chip based type indicating agreement. E-money and Tapcash users demonstrated strong agreement (77.78% and 78.78%, respectively). Chi-Square values suggest minor associations between chip based types and the inclination to choose the cheapest option.

***"Using an electronic money chip based that can be used at many merchants and electronic money readers"***

This item evaluates respondents' interest in electronic money chip based products usable at numerous merchants and electronic money readers. Responses differ across chip based types. E-money and Tapcash users exhibited strong agreement (57.78% and 58.78%, respectively). Chi-Square values suggest weak associations between chip based types and the preference for widespread usability.

#### 4.6 Post Purchase Behavior

According to Kotler & Armstrong (2018), after consumers buy a product, they may feel disappointed with certain features that do not match their initial expectations. However, consumers may also hear positive comments about similar brands, which can shake their confidence in a recently purchased product. Based on the factors presented in the questionnaire, namely, evaluating the current admin costs *top up*, facility *top up*, the use of electronic money chip based as a substitute for cash, and the benefits of promos and discounts in using electronic money chip based.

**Table 7. Post Purchase Behavior**

Variable	Item	Chi Square	Flazz	Brizzi	E-money	Tap Cash
Evaluating the usefulness of Electronic Money Chip based as a substitute for cash	1	0.277	26	19	51	7
	2		1	0	4	0
	3		1	0	4	0
	4		9	0	18	1
	5		7	1	17	1
Evaluate the benefits of promotions and discounts when using electronic money chip based	1	0.558	6	0	7	0
	2		4	1	13	0
	3		10	2	21	2
	4		9	6	23	3
	5		27	13	43	6
Evaluate admin fees when top up after using an electronic money chip based	1	0.039	8	0	10	0
	2		5	1	18	0
	3		16	2	26	3
	4		13	7	31	3
	5		14	12	22	5
Evaluate the convenience of top up electronic money chip	1	0.709	1	0	1	0
	2		1	0	6	0
	3		4	3	11	0

based after using them	4		14	3	31	4
	5		36	16	58	7

Based on data Figure 5.8 describe post-purchase behavior users electronic money chip based based on several aspects that are evaluated after the use of electronic money chip based,

***"Evaluating the usefulness of Electronic Money Chip based as a substitute for cash"***

This item measures respondents' perspectives on the effectiveness of electronic money chip based as a substitute for physical cash. The responses span from Strongly Disagree to Strongly Agree. Looking at the data, a considerable portion of participants across all chip based types leaned toward agreement. E-money Mandiri users showed strong agreement, with 51 participants (47.66%), followed by BCA Flazz (26 participants or 47.27%), BRIZZI (19 participants or 86.36%), and Tap Cash BNI (7 participants or 63.63%). The Chi-Square values suggest weak associations between chip based types and the perception of electronic money chip based usefulness.

***"Evaluate the benefits of promotions and discounts when using electronic money chip based"***

This item explores respondents' views on the benefits of promotions and discounts when utilizing electronic money chip based. The majority of participants within each chip based type indicated agreement. Among E-money Mandiri users, 43 participants (40.18%) strongly agreed, while 27 participants (24.77%) among BCA Flazz users and 13 participants (59.09%) among BRIZZI users expressed strong agreement. The Chi-Square values suggest limited associations between chip based types and perceptions of promotional benefits.

***"Evaluate admin fees when top up after using an electronic money chip based"***

This item assesses participants' evaluation of administrative fees when recharging electronic money chip based after usage. The majority of respondents, across most chip based types, displayed agreement. E-money Mandiri users indicated strong agreement, with 26 participants (24.30%), followed by BCA Flazz (16 participants or 29.09%), BRIZZI (2 participants or 9.09%), and Tap Cash BNI (3 participants or 27.27%). The Chi-Square values suggest minor associations between chip based types and the assessment of admin fees.

***"Evaluate the convenience of top-up electronic money chip based after using them"***

This item examines respondents' perceptions of the convenience of recharging electronic money chip based after their use. The majority within each chip based type showed agreement. Among E-money Mandiri users, 58 participants (54.21%) strongly agreed, while 36 participants (33.64%) among BCA Flazz users and 16 participants (72.72%) among BRIZZI users expressed strong agreement. The Chi-Square values suggest weak associations between chip based types and perceptions of top-up convenience.

#### **4.7 Managerial implications**

The comprehensive insights drawn from this research have far-reaching managerial implications that hold the potential to reshape the landscape of electronic money adoption, digital financial services, and customer engagement strategies in Indonesia. As electronic payments gain prominence as a secure and convenient means of accessing funds, understanding and harnessing the intricate dynamics of consumer decision-making becomes paramount for businesses, financial institutions, and policymakers alike.

##### **1. Tailored Marketing Strategies:**

The nuanced decision-making process revealed by this study necessitates a departure from one-size-fits-all marketing approaches. Businesses can leverage the awareness consumers have of electronic money's significance to craft compelling narratives that resonate with their needs and preferences. Crafting targeted messaging for specific customer segments, showcasing how electronic money addresses their unique pain points, can yield a stronger emotional connection and drive adoption.

##### **2. Enhancing Product Attributes:**

The study's finding that product attributes heavily influence purchase decisions underscores the importance of refining and innovating product features. Offering a variety of attributes that cater to different user preferences, such as convenient top-up options, attractive designs, and compatibility with a wide range of merchants, can provide a competitive edge and attract a broader customer base.

##### **3. Building Institutional Trust**

The inclination towards electronic money chip based products offered by established financial institutions signifies the significance of trust. Financial institutions can capitalize on this trend by continually emphasizing security, reliability, and transparency in their offerings. Developing robust security measures and clear communication can instill greater

confidence in users, facilitating increased adoption.

#### 4. Ongoing Post-Purchase Engagement

The ongoing evaluation and engagement displayed by users in the post-purchase phase signal the need for continuous customer relationship management. Businesses can introduce loyalty programs, regular updates, and responsive customer support to sustain user engagement and loyalty. Additionally, addressing concerns about admin fees and top-up convenience can enhance user satisfaction.

#### 5. Collaborative Ecosystems

The research highlights the diverse information-seeking behaviors among users. This suggests the value of fostering collaborations between electronic money providers and digital platforms to ensure comprehensive and accurate information dissemination. Partnerships with relevant digital channels can aid in reaching and educating diverse customer segments effectively.

### 5. CONCLUSION

This comprehensive research endeavor delves into the intricate customer decision-making process associated with electronic money chip based adoption, focusing on the BCA Flazz, BRIZZI, E-money Mandiri, and Tap Cash BNI. Through a meticulous examination of the sequential stages of problem recognition, information search, alternative evaluation and purchase, purchase decision, and post-purchase behavior, this study brings forth profound insights that resonate deeply with the contemporary landscape of digital financial interactions.

Commencing with the initial stage of problem recognition, the data underscores a significant consensus among users from all chip based types. They unequivocally recognize the pivotal role of electronic money chips in modern transactions, identifying them as essential tools and potent substitutes for conventional cash. This convergence of opinions reflects a paradigm shift toward embracing the digitization of financial interactions, underscoring the transformative nature of electronic money.

Transitioning to the information search phase, the analysis accentuates distinct information-seeking behaviors across chip based types. While all groups engage with various online platforms and recommendations, nuances in engagement levels and chosen channels become apparent. This reinforces the need for strategic information dissemination across diverse digital avenues, catering to the eclectic preferences and behaviors exhibited by users.

Progressing to the stage of alternative evaluation and purchase, a crucial conclusion emerges: users display a nuanced decision-making approach, each influenced by unique attributes. Usability, pricing, and operational efficiency emerge as pivotal considerations across all chip based types. Notably, users express a pronounced inclination toward electronic money chip based products provided by established banks, signaling a deep-rooted trust in the security and reliability of established financial institutions.

As the study moves into the purchase decision phase, a pivotal observation surfaces: users' selections are significantly influenced by specific product features. Whether it's the convenience of NFC top-up, aesthetic allure, widespread accessibility, or cost-effectiveness, users meticulously assess these facets while making their purchase choices. This reveals the multifaceted nature of user considerations, extending beyond functional attributes.

Finally, the post-purchase behavior stage provides a window into users' ongoing interactions with their chosen electronic money chip based. A remarkable trend emerges as users across all chip based types appreciate electronic money chip based as adept substitutes for cash. Additionally, users keenly evaluate the benefits of promotions, discounts, admin fees, and top-up convenience. This underscores a continuous cycle of user evaluation and engagement post-purchase, indicating an evolving and engaged relationship with their electronic money chip based.

In summation, this comprehensive study delves deep into the customer decision-making process within the realm of electronic money chip based. Through each stage, it unravels layers of user preferences, behaviors, and motivations, offering an invaluable perspective for stakeholders in the digital financial domain. These insights illuminate a path forward for tailoring strategies and offerings that align seamlessly with user expectations and aspirations. In the ever-evolving landscape of digital financial solutions, understanding user behaviors remains a cornerstone in sculpting effective, user-centric experiences.

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