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NATIONAL UNIVERSITY OF MANAGEMENT

THESIS

EXAMINING BENEFITS OF A UNIQUE
DIGITAL IDENTITY TO ADDRESS
CHALLENGES OF HAVING MULTIPLE
IDENTIFICATION CARDS AND NUMBERS
CASE STUDY: PHNOM PENH, CAMBODIA

BY

KHUT LANGDY

Phnom Penh
2023



FACULTY OF
DIGITAL ECONOMY

MINISTRY OF EDUCATION, YOUTH, AND SPORT



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Challenges of Having Multiple Identification Cards and Numbers
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**Project Thesis Submitted in Partial Fulfillment of the Requirements for the
Degree of Bachelor of Digital Economy
(English-Based Program)**

**SPECIALIZATION IN
FINANCIAL TECHNOLOGY**

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DECLARATION

I declare that this thesis is my own work and has not been submitted for a degree at any university. Information derived from the published or unpublished work of others has been acknowledged in the text and a list of references is given.



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ABSTRACT

Possessing multiples identification cards and numbers has created challenges and difficulties for citizens. The study has two objectives, one is to identify the challenges and difficulties of having multiple identification cards and numbers encountered by citizens and two is to presents a novel solution, the NFT-based Identity (NID) project, to expedite identification processes by allowing individuals to have a single digital identity, removing the need for various identification numbers. The study used a quantitative research technique, with 171 respondents. A standardized questionnaire was delivered both physically and online to collect the data. Respondents from diverse age groups, occupations, and income levels related their experiences with handling several identity cards and numbers. Descriptive statistics were used to examine the average number of ID cards issued, frequency of usage, challenges encountered, and strategies used to handle identifying information. The research finding revealed that Cambodians citizens posing concerns such as increased risk of loss, restricted wallet capacity, and difficulty quickly locating the correct card. Furthermore, respondents found it difficult to remember their identification numbers, reducing productivity and perhaps generating mistakes during transactions. The proposed NID project, which provides a unique digital identification platform, presents an achievable solution to these challenges.

Keywords: Identity, Identification, NFT, Digital Identity, Uniqueness, Multi-purpose Card, Multi-purpose Identity, Blockchain

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CHAPTER ONE: INTRODUCTION

1.1. BACKGROUND OF THE STUDY

The true nature of any identity is multifaceted as its functional purpose is to prove the uniqueness of an individual, ensure accountability, establish trust, and provide a point of reference for legal, social, and economic transactions. People frequently find themselves carrying numerous identification cards and need to remember those identification numbers for some cases in the digital world to fulfill varied responsibilities and access necessary services. This phenomenon results from the demand for identity verification and authentication across a range of industries, including government, healthcare, banking, education, and employment. King Henry V of England established the use of physical ID cards for the first time with the Safe Conduct Legislation of 1414 (Benedictus L, 2006). The ID card contains personal details, including the person's complete name, picture, gender, date of birth, and identification number (Camp, 2004).

Identification cards are issued by governments, organizations, and the private sector for different purposes. For instance, government-issued identification cards, such as driver's licenses, passports, and national identification cards, function as identification documents and are commonly accepted for a variety of official tasks. Employee ID cards are used in certain businesses or organizations to control access to specified locations, monitor attendance, and maintain workplace security. Banks also create cards for customers to present their bank account number when making transactions. Shop owners also create a marketing strategy by issuing membership cards to make buyers save points to redeem rewards from the shop. Different sectors will issue different identification cards for different use cases.

1.2. RESEARCH PROBLEM

Many issues have been raised by the spread of numerous identification cards and ID numbers. Conceptually, individuals may face identity confusion because of the similarity of card designations. Having to carry and present several identification cards can be cumbersome for people, which can lead to misunderstandings during administrative procedures and possible delays in receiving services. The fragmented structure of many identification systems can make it challenging to confirm a person's identity across different industries, which adds to paperwork redundancy and raises the possibility of identity theft or misuse. Keeping the ID cards in the wallet or bag is prone to loss and damage (UK.gov, 2022; Harvard Service Center, n.d).

Another disadvantage of physical ID cards is requiring human management and storage. People frequently struggle with practical issues, such as carrying and managing several cards and gaining access to services that demand special identification, which might cause problems for the cardholder while using them (Smith, Brown, & Johnson, 2020). Physical ID cards are prone to being damaged by heat, water, time, pressure, and other factors (Darmawan & Santoso, 2019). Having multiple cards also leads to frustration due to the increase in thickness of the wallet (Islam, 2009).

In Cambodian context, citizens may or are required to carry multiple cards to access certain services or purposes. These include the national ID card, driving license vehicle identity card, and bank cards.

1.3. RESEARCH OBJECTIVE

The study has two objectives which are:

1. to identify the challenges, difficulties, and possible risks associated with possessing multiple identification cards and numbers, and
2. to propose an NFT-based identity (NID) to tackle the challenges of having multiple identification cards and numbers.

1.4. RESEARCH QUESTION

The study employs two research questions:

- 1) What are the challenges and difficulties of having multiple identification cards and numbers among citizens in Cambodia.
- 2) How can the NID tackle the challenges and difficulties of having multiple identification cards and numbers.

1.5. RESEARCH SIGNIFICANCE

This study has significant implications for both academic and practical fields. The study will not only provide insights on challenges and difficulties encountered by the citizens due to the possession of multiple identification cards and numbers, but also propose an innovative platform to tackle the challenges. The study will also contribute to academic knowledge for future researchers.

CHAPTER TWO: LITERATURE REVIEW

2.1. DIGITAL IDENTITY

A digital identity is a one-of-a-kind depiction of a subject involved in an online transaction. In the context of a digital service, a digital identity is always unique. Shortly, gadgets' digital identities will be crucial in performing transactions, especially since the devices will be able to interact somewhat independently of people. It also had some definition from NIST, which stated that it is "the unique representation of a subject engaged in an online transaction. Digital identity is always unique in the context of a digital service, but it does not necessarily need to uniquely identify the subject in all contexts. In other words, accessing a digital service may not mean that the subject's real-life identity is known". And from the World Bank Group (2016), stated "A collection of electronically captured and stored identity attributes that uniquely describe a person within a given context and are used for electronic transactions". The last from the World Economic Forum stated, "Digital identity enables transactions in the digital world and offers improved functionality for its users."

Digital identity has developed into a key and complicated part of today's digital world. It is a distinct representation of a human involved in online transactions, distinguished by its uniqueness in the context of digital services. Uniqueness entails ensuring the uniqueness of any method's user population. The degree of risk produced in any transaction where identification is critical is proportionate to the level of uniqueness. As a result of the increased risk, higher identity assurance is required. Uniqueness contributes significantly to the fight against identity theft by strengthening the credibility of the identification (Simon, 2022).

Combining digital identity with decentralized systems can make it secured and useful. A decentralized, open identity system allows public and private sector organizations to create, use, and administer their own digital identities within a self-regulated framework. In the United States, for example, the National Strategy for Trust Identities in Cyberspace (NSTIC) has taken steps to establish a user-centric "Identity Ecosystem" of public and private sector organizations that use secure, efficient, and interoperable identity solutions to access online services in ways that promote trust, privacy, choice, and innovation. The plan is entirely voluntary, to offer high-level direction to the private sector (World Bank Group, 2016).

2.2. RELATED WORK

The Malaysian government publicly unveiled the "MyKad" 12-digit multipurpose smart identity card in September 2001. This MyKad comprises information about the

cardholder's identification that fits on a single card and has various functions and sets of information. The MyKad initiative is the first smart gadget backed by the government. It has been hailed as a major development in information technology, both domestically and abroad, (Thomas, 2004). The first multi-purpose card that was implemented by the Malaysian government can serve different public and private services.

The four applications that are part of MyKad are for health information, driver's license, passport, and national identity card information. These four apps have been supplemented by four additional ones since they are still insufficient to offer customers convenience. The four applications include the Public Key Infrastructure (PKI) functionality for online transactions, the electronic wallet, ATM access, the transportation application (with the "Touch and Go" feature), and the electronic wallet. The use of the applications is permitted for official and business-related purposes, and it facilitates speedy payment for small transactions (Ai Kee et al., 2012; Ahmad, 2010).

In Japan, My Number can be used for multiple purposes such as a driver's license and an ID card. It can be used at the convenient stores, to print the certifications, as health insurance Proof of COVID-19 vaccination, or to redeem my number point (Mapoint). All inhabitants of Japan are given a 12-digit number called My Number, which is used and maintained by certain guidelines for social security, taxation, and disaster response laid out in the My Number Act. My Number is used to verify if a person's personal information is the same as that stored by other organizations.

My Number has made life in Japan easier, reduced the use of paper documents and cards for resident information, and improve the administration service. During COVID-19, a special flat-sum cash benefit program of 100,000 yen was implemented for every resident of Japan who used my number. Two of the three components of My Number are My Number, which makes it possible to identify reliably and quickly an individual online, and MyPortal, a personal online site run by the government that allows individuals to view and use administrative services online (Iwasaki, 2020; Citizen Services Division, 2022).

Islam (2009) investigates the challenges faced by Swedish people when using multiple identities. His study finds that many Swedish people experience difficulties and inconveniences due to having multiple cards and numbers. These include the feeling of frustration and confusion. Many claim to have lost the cards. To tackle these problems Islam proposes the Swedish government to implement a multi-purpose card system, combined with

new technology like biometric fingerprints. The study by Darmawan and Santoso (2019) also found that physical ID cards can affect the environment and create user inconveniences. The authors surveyed to evaluate the use of these digital ID cards.

CHAPTER THREE: METHODOLOGY

The study design, data collection techniques, and analytical procedures used to fulfill the research objectives and answer the research questions are described in this section.

3.1. QUANTITATIVE APPROACH

Quantitative research is described as "research that employs a standardized set of questions with a large sample of people to generate data that can be coded and expressed numerically" (Elliott, 2005). To address certain queries or hypotheses, it also provides numerical descriptions of the phenomena. Providing accurate and objective descriptions of a phenomenon and how it might be controlled by adjusting the variables is another important goal of quantitative research.

The design questionnaire in this survey has been divided into 3 sections. First, it focuses the responses; second it focuses on the challenges of using multiple identities; and third, it focuses on the challenges of using and remembering the ID number.

Both physical and online surveys were distributed to participants. The survey aimed at collecting data from those who had faced challenges in using and managing multiple ID cards and ID numbers. Descriptive statistics were used to analyze and interpret the data.

3.2. SAMPLING

This study aimed at people who carry identity cards and remember their ID numbers for this study. The population in this study was unknown. Based on Conroy (2016), assuming the population is greater than 5000, with a margin of error of 7.5%, the sample size for the research was 171. Both physical and online survey were distributed. Physical surveys were distributed at a few locations such as the National University of Management (NUM), the Institute of Technology of Cambodia (ITC), the Royal University of Phnom Penh, the riverside in front of the Royal Palace, and the central market.

Table 1: Sample size by Canroy

Acceptable Margin of Error	Size of population					
	Large	5000	2500	1000	500	200
±20%	24	24	24	23	23	22
±15%	43	42	42	41	39	35
±10%	96	94	93	88	81	65
±7.5%	171	165	160	146	127	92
±5%	384	257	333	278	217	132
±3%	1067	880	748	516	341	169

(Source: Conroy (2016), The RCSI Sample Size Handbook)

CHAPTER FOUR: RESEARCH FINDING

4.1. DEMOGRAPHIC PROFILE

Below is the general information from the respondent including age, gender, occupation, income, and current residence.

Table 2: Table of Demographic profile

	Detail	N=168	Frequency (%)
Age	15-24	67	39.88%
	25-44	89	52.98%
	45-64	11	6.55%
Gender	Male	91	54.17%
	Female	77	45.83%
Occupation	Staff	45	25.79%
	Student	53	31.55%
	Vendor	21	12.50%
	Self-owned Business	21	12.50%
	Tri-cycle Driver	11	6.55%
	Teacher	8	4.76%
	Other	9	5.36%
Income	Under \$250	41	25.60%
	\$250-\$500	64	38.10%
	Over \$500	61	36.31%
Current Resident	Phnom Penh	169	100%

(Source: Author Survey)

The surveyed population spans various age groups, with 39.88% falling between 15 to 24 years, 52.98% between 25 to 44 years, and 6.55% aged 45 to 65 years. Gender distribution is nearly equal, with 54.17% identifying as male and 45.83% as female, indicating a balanced sample. In terms of occupation, students represent 31.55% of respondents, followed by staff at 26.79%. Self-owned business owners and vendors both account for 12.5%, while tricycle drivers constitute 6.55%, teachers 4.76%, and other occupations 5.36%. Regarding income levels, 38.10% fall within the \$250 to \$500 bracket, while 36.31% earn around \$500, with the remaining 25.6% earning less than \$250. Notably, the study is focused in Phnom Penh, making it the residence for all participants, resulting in a 100% response rate from the city.

4.2. DESCRIPTIVE STATISTICS

The Average of ID Cards and ID Numbers

The below table shows the average ID number and ID card that respondents have.

Table 3: The average of ID cards and ID numbers

	ID number	ID card
Count	168	168
Average	5.38	4.70

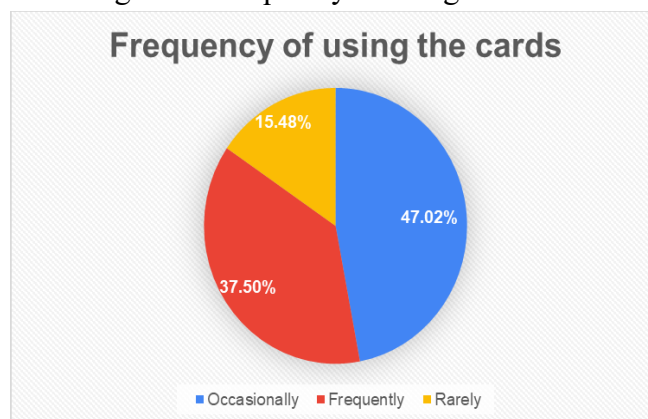
(Source: Author Survey)

Every day, the ID number of the person is important information that they need to know, or sometimes they need to remember that number. In average a person carries up to five ID cards or numbering.

Frequency of Use

The below graph shows the frequency of use of the cards. The level of frequency used is divided into rarely, occasionally, and frequently. From the 79 (47.02%) of 168 respondents, they use their card occasionally, followed by the 63 (37.5%) who use it frequently, and the 26 (15.46%) from all participants who rarely use it.

Figure 1: Frequency of using the cards



(Source: Author Survey)

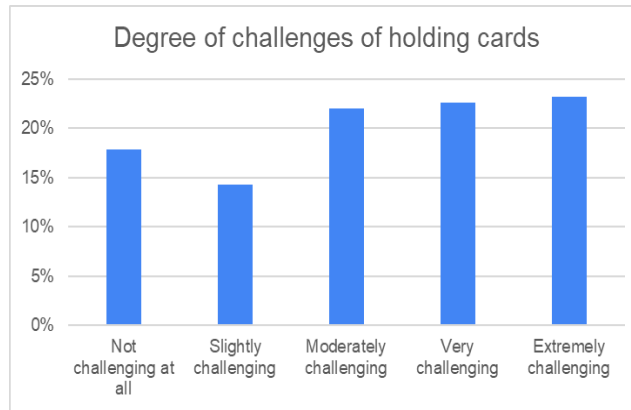
This data shows the use of cards, some of which they do not use daily and some of which they just use for specific purposes. But they still have some information on the card they need to use for daily use.

Degree of challenges of holding ID cards

After knowing the average card and the frequency of use of the card that people have, set the degree of challenge from 1 to 5, from not challenging to extremely challenging. The table below shows the challenges of managing so many cards. Most of them face three different

levels of challenges: moderately challenging is 22.02%, very challenging is 22.62%, and extremely challenging is 23.21%.

Figure 2: Degree of challenges of holding cards



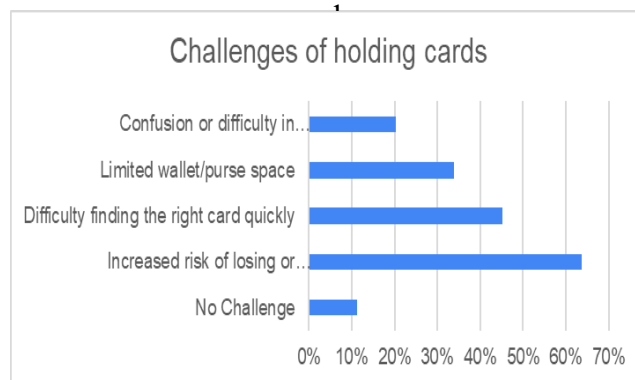
(Source: Author Survey)

People face a degree of challenge while carrying the card because it can make it difficult to manage or take the card while using or providing information to the service provider or sender. It will also face the risk of being lost or damaged. Sometimes they also forget the card and the information on it.

Challenges of holding ID cards

The most common challenge of carrying ID cards that got from the survey is the increased risk of losing or misplacing them is 63.69%. This is followed by the difficulty of finding the right card quickly (45.24%) and limited wallet or purse space (33.93%). Overall, the challenges of carrying ID cards can be significant, and it is important to weigh the risks and benefits of doing so before deciding whether to carry an ID card.

Figure 3: Graph showing challenges of holding

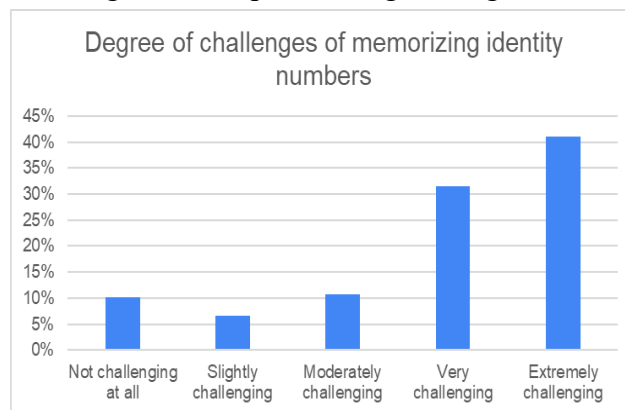


(Source: Author Survey)

Degree of challenges of memorizing ID number

The graph shows that most people find it challenging to memorize identification numbers. The percentage of people who find it extremely challenging (41.07%) is even higher than the percentage of people who find it very challenging (31.55%).

Figure 4: Graph showing the degree of



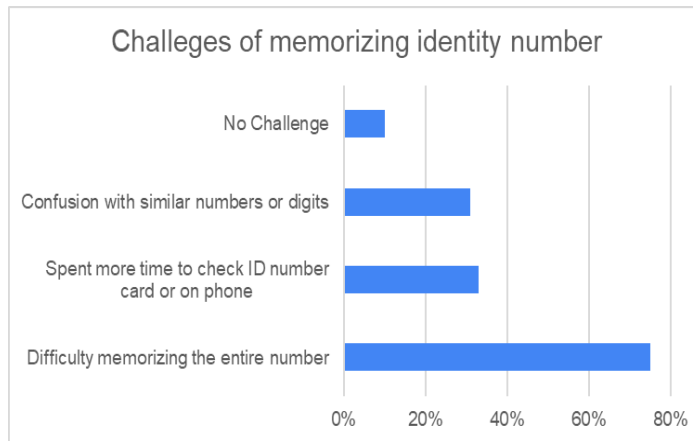
(Source: Author Survey)

This suggests that a significant number of people have difficulty remembering their identification numbers. However, there are a few possible reasons. One possibility is that the numbers are simply too long and complex to remember. Another possibility is that people do not use their identification numbers very often, so they do not have a chance to practice remembering them.

Challenges of memorizing ID number

The data shows the challenges that individuals face when dealing with identification numbers. The most common challenge is difficulty memorizing the entire number (75%), followed by spending more time checking ID number cards or on the phone (33.33%), and confusion with similar numbers or digits (30.05%). Difficulty memorizing the entire number is a common challenge because identification numbers are often long and complex. It can be difficult to remember a long string of numbers, especially if you do not use them very often.

Figure 5: Challenges of memorizing identify



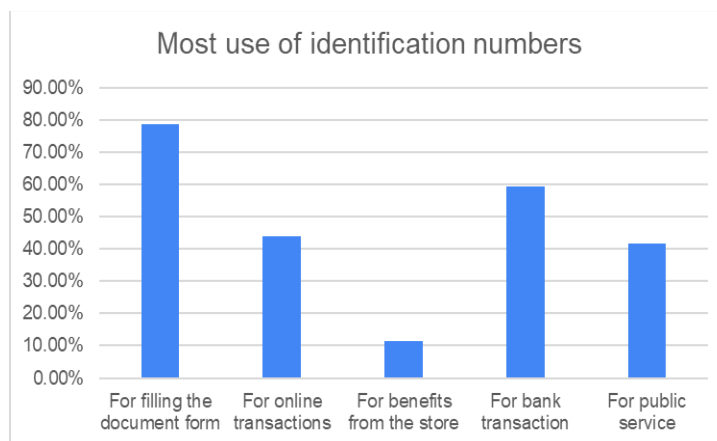
(Source: Author Survey)

Spending more time to check ID number cards or on the phone is another common challenge because it can take time to find your ID card or to enter their identification number on the phone. This can be especially frustrating if people are in a hurry, or they are not familiar with the process. Confusion with similar numbers or digits: This is a challenge that can occur if the identification number has similar numbers or digits. For example, if the identification number is 123456789, a user might confuse it with 123456790. The data suggests that identification numbers can be challenging to deal with. This can be a problem for individuals who need to use their identification numbers frequently.

Identity number use case

The most common use cases for identification numbers. The most common use case is filling out document forms (78.57%), followed by bank transactions (59.52%), online transactions (44.05%), and public service (41.67%).

Figure 6: Most use of identification numbers



(Source: Author Survey)

These four use cases have almost the same purpose, which is to verify the identity of the person involved in the transaction or activity. For example, when people fill out a document form, they need to provide the identification number to verify who they are. Similarly, when users make a bank transaction, they need to provide an identification number to verify that they are the account holder. The other use cases for identification numbers are less common, but they are still important. For example, students may need to provide their identification number to get a library card or vote in an election. The data suggests that identification numbers are used in a variety of contexts to verify the identity of individuals. This is important for ensuring the security and integrity of these transactions and activities.

The average cards and ID numbers by occupation

The following table shows the average card, the challenges of carrying a card, the average identity number, and the challenges of having an identity number. But I just arranged it by occupation. In the table, the Self-owned businesses have an average card size of around 6 and an average ID number of around 7. The challenges that they face are 4.1 for the card and 4.4 for the ID number. And for vendors and staff, the average is 6, and the ID number is also 6. The challenges for vendors are 3.9 and 4.4, while for staff they are 3.0 and 3.7. For the rest of the occupations, they have at least 4 cards; some will have 4 ID numbers, and some have 5 or 6. The challenges are not different from those of other occupations.

Table 4: Average of Id card and Id number by occupation

	Occupation	Frequency of use		Average of card	Challenges of carry	Average of ID number	Challenges of ID number
Occupation	Student	Frequently	10	4	2.7	4	4.4
		Occasionally	33				
		Rarely	10				
	Vendor	Frequently	12	5	3.9	6	4.4
		Occasionally	8				
		Rarely	1				
	Staff	Frequently	14	5	3.0	6	3.7
		Occasionally	22				
		Rarely	9				
	Self-owned business	Frequently	15	6	4.1	7	4.4
		Occasionally	5				
		Rarely	1				
	Tri-cycle driver	Frequently	4	4	3.7	6	4.4
		Occasionally	4				
		Rarely	3				
Teacher	Frequently	4	4	3.6	5	4.0	
	Occasionally	4					

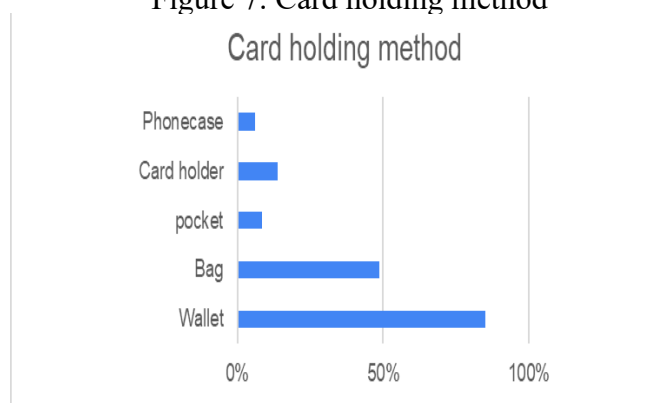
	Other	Rarely	0	4	2.2	4	3.7
		Frequently	3				
		Occasionally	4				
		Rarely	2				

(Source: Author Survey)

Card holding method

The graph shows that the most common place to keep ID cards is in a wallet (85.12%). This is followed by keeping them in a bag (48.81%), some they keep with card holder, pocket, and phone case are below 15%. The data suggests that most people keep their ID cards such as a wallet or bag. This is important because ID cards can be used to verify your identity. However, the risk of losing that information still happens for them because all of the cards can have the risk of loss and damage. And identity theft.

Figure 7: Card holding method

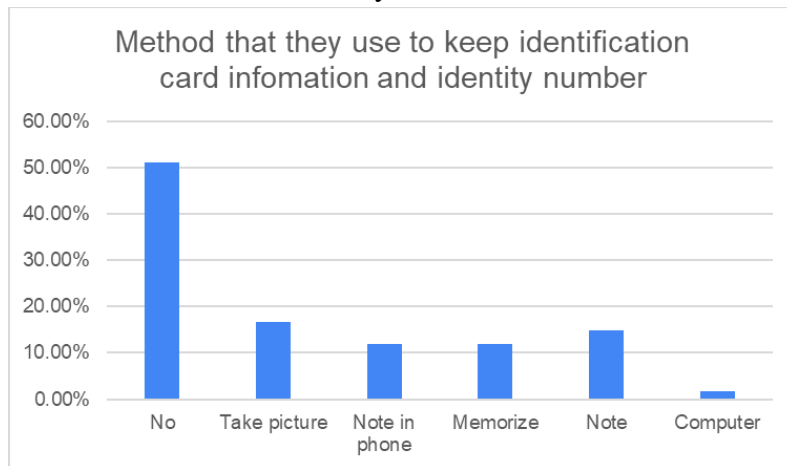


(Source: Author Survey)

Methods used to keep ID cards and ID numbers

The percentage of people who use different methods to keep their ID information. Most of the participants don't have any method to keep the information on the card the answer "No" is (51.19%). This is followed by taking a picture of the information (16.67%) and writing it down in a note (14.88%). Fewer people use other methods, such as memorizing the information (11.90%) or taking a picture of the information and saving it on their phone (11.90%).

Figure 8: Method that they use to keep identification card information and identity number



(Source: Author Survey)

This data suggests that many people find it difficult to memorize their identification numbers. This could be because the numbers are long and complex, or that people do not use them very often. The data also suggests that there is no one-size-fits-all solution to the problem of memorizing identification numbers. Some people may find it helpful to use mnemonic devices, while others may prefer to take a picture of the card or keep it in a safe place. More than that this could be a security risk, as it could make it easier for someone to steal their identity. More than that they will forget the information on the card or hard to find the right one when they use some service that requires an ID number or ID information.

CHAPTER FIVE: DISCUSSION

5.1. PEOPLE CARRYING MULTIPLE ID CARDS

The aim of the survey is to explore the challenges faced by Cambodians who hold multiple identification cards and have a lot of identification numbers. Respondents in the survey reported an average usage of approximately 5 ID cards. It shows that people frequently find themselves carrying several identification cards for different reasons, such as work, personal identity, payment or financial service, and service access. The variety of cards they carry suggests that navigating through a daily routine requires managing an array of identification documents.

Carrying several ID cards increases the risk of losing the cards. The anxiety of misplacing crucial cards emphasizes the dangers of losing personal and professional identification. The difficulty in finding the card is that almost half of respondents said it was difficult to find the proper card quickly when needed. This challenge highlights the utility of swiftly accessing the relevant card in a variety of circumstances. The constraint of wallet space was highlighted as a serious difficulty. As people create more cards, actual storage space becomes limited, potentially resulting in annoyance and disorder. From the above result, many people face the problems of loss, inconvenience, time-consuming, and human error.

The above result is the same as the study by Islam (2009) he conducted the research in Sweden, the problems that he identified were frustration at carrying so many cards at the same time, limited wallet space, and inconvenience.

5.2. PEOPLE WITH MANY IDENTIFICATION CARDS

The average number of identification numbers reported as memorized by our respondents is around 5. This means that people need to remember and use their memory, which might cause cognitive issues. Several key obstacles arise from the challenges respondents experienced in identifying numbers. The difficulty recalling ID numbers is the most critical challenge. This emphasizes the cognitive load and mental effort necessary to memorize a range of identification numbers constantly. Time spent checking ID numbers to confirm accuracy, typically from mobile phones or other sources, surfaced as a difficulty.

Identification number use cases vary greatly, reflecting the vast range of scenarios in which people are compelled to furnish these numbers. When filing paperwork, respondents said they used identifying numbers while filing paperwork. This implies that identifying numbers is

important in administrative chores and record-keeping. Bank transactions about 60% of respondents said they use identification numbers for bank transactions. The need for correct recollection for secure and smooth transactions is highlighted by the high frequency of usage in financial interactions. Online transactions and public services Approximately 40% of respondents reported utilizing identification numbers for online transactions and interactions with government agencies. These findings demonstrate the digital change in many identification verification methods.

These difficulties might have an impact on personal organization, security, and even mental burden. The findings emphasize the necessity of designing solutions that address these problems as individuals navigate a fast-paced environment. Technical developments or other techniques for identification may provide options to lessen the stress that people face.

The following sections go deeper into the issues respondents encounter when it comes to carrying and remembering identification numbers, providing a thorough knowledge of the multi-dimensional nature of handling identity in today's dynamic world.

The findings concerning identification numbers highlight the cognitive hurdles that people confront while retaining several ID numbers. The frequency of difficulties such as trouble remembering, and digit sequence confusion highlights the need for effective memory procedures or other approaches to lessen cognitive stress.

The data from use cases indicates the broad usage of identification numbers in a variety of disciplines, ranging from administrative procedures to financial and digital connections. These findings highlight the importance of simple, safe, and user-friendly techniques for memorizing and utilizing identification numbers.

Identification number issues can have ramifications for personal efficiency, security, and accuracy. Digital identification and secure single ID are two examples of innovations that might help people overcome these issues. In a world where identification is becoming increasingly important in a variety of scenarios, these findings provide a significant viewpoint for improving the user experience and alleviating cognitive problems.

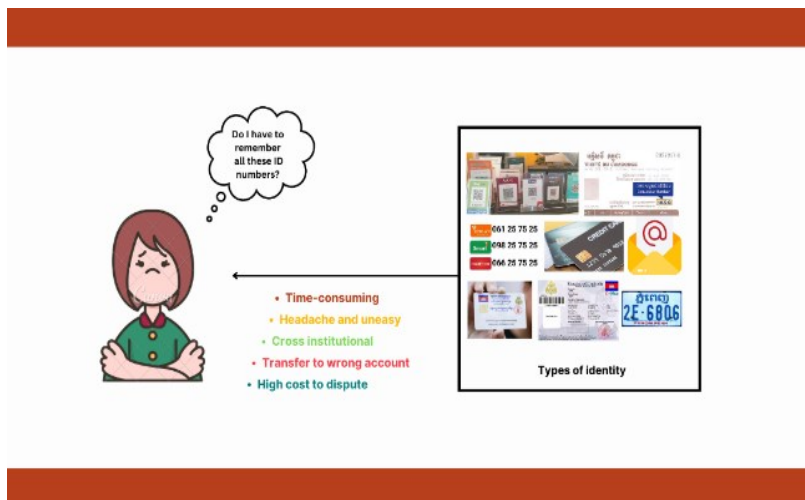
CHAPTER SIX: IMPLICATION TO PROPOSE NID PROJECT

6.1. INTRODUCTION TO NID PROJECT

NID is a Web3 platform that allows users to create a digital ID that links several IDs in one place, such as a national ID card, bank account, utility bill ID, phone number, email address, and many more.

Problem: people need to carry many types of identification cards to access the service and they cannot remember all their IDs when carrying out transactions and attempting to use them. As a result, several concerns may occur concurrently, such as the possibility to transfer to wrong account ID, time-consuming, high cost to dispute, cross-institutional Uneasy in organizing IDs, and the Risk of losing the card.

Figure 9: Problem if having many identification cards



(Source: NID problem, nid-whitepaper, 2023)

Feature: NID enables users to create a digital ID that can be used to connect all of the above-mentioned vital information in one place. Users no longer need to worry about security, losing and forgetting their IDs, or dealing with the inconveniences of carrying multiple ID cards, because of the ability to generate unique digital IDs based on user preferences and securely store all important identity information in newly digitalized.

Figure 10: NID solution framework



(Source: NID feature, nid-whitepaper, 2023)

What NID will help users?

Users can link more than one account ID due to the NFT feature that allows NID to securely and easily attach all of the user's vital information in one location. Users do not copy and paste an account number when processing transactions, paying utility bills, accessing public and private services, and transferring money. Users only need to enter their NID, and it will automatically search for their account ID in a matter of seconds. Users may link more than one identity number, allowing NID to safely and conveniently attach all of the user's critical information in one area. When completing transactions, paying utility bills, or transferring money. Users simply need to provide their NID, and the system will search for their account ID in seconds.

This project was developed on Polygon Blockchain for various reasons, including usability, functionality, stability, and security. Polygon is the first well-structured, user-friendly Ethereum scaling and infrastructure development platform. Polygon SDK, a modular, adaptable framework that facilitates the development of many sorts of apps, is its main component. Polygon is quickly becoming a preferred location for apps looking to expand their ecosystems by connecting to as many different blockchains as possible.

6.2. SUGGESTION

After finding and discussing the challenges that Cambodian people face with identification cards and numbers, it's not different from other countries. The survey results show the concerns and challenges.

6.2.1. PROBLEM WITH CARRYING IDENTIFICATION CARD

People always take their cards out daily and store them in their wallets or bags. Some cards are not used frequently, which can make their wallet thick and inconvenient, and they will face the risk of losing the batch of cards and spending more time finding the right card. The risk of lost and damaged cards, inconvenience, time-consuming,

6.2.2. SUGGESTION TO USE NID

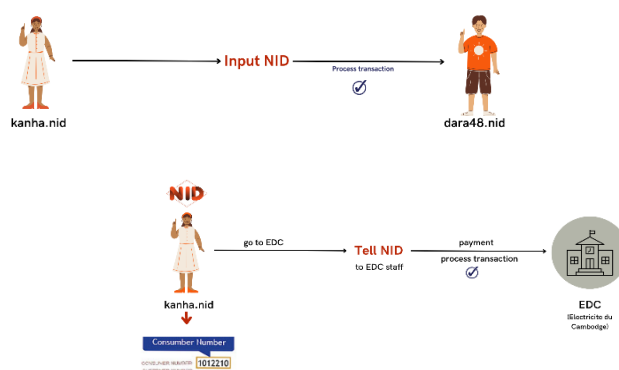
To deal with the problem of carrying multiple identification cards, the limitation of the wallet, the risk of losing and damaging the cards, user inconvenience, and human error NID has created a function that allows users to link the information on the card into digital world, so people don't need to carry multiple cards like before. They just need to remember a single unique digital identity instead of carrying those cards. Also, the unique digital identification makes it easy to represent the user's information both physically and digitally.

6.2.3. PROBLEM WITH REMEMBERING IDENTIFICATION NUMBERS

Having many identification numbers is not easy. Sometimes holders need to memorize those digits to process transactions or access some services. Human error, forgetting the ID number, or providing the wrong information are the issues that will arise during the process or activities daily.

Regarding the issue, the NID project can assist users by allowing them to link a range of identifying numbers, and users only need to know a single ID. For instance, if Dara has three ID numbers, he associates those IDs with his NID NFT name dara. nid, so that he only needs to remember his NID dara.nid when using a service or performing a transaction

Figure 11: Using NID for transaction



(Source: NID feature, nid-whitepaper, 2023)

People can take a photo of the card, some note the ID number on the paper, and most of them just take it and find the card when they need it. It's a problem with physical cards, and now that many businesses have created digital services, it's also an important part of the new economic era. People have smartphones and can access the internet, so digital identity will be a good choice for now and in the future. E-services and E-governance may need some information to access (log in). So if people don't want to waste time, an easy and consistent unique digital identity will be their first choice, and the NID project will help them.

CHAPTER SEVEN: CONCLUSION

Finally, this study investigated the difficulties Cambodians face while handling various identity cards and the need to memorize numerous identifying numbers. The findings highlight the complexities of this issue and highlight the inconveniences and risks. The NID project initiative appears to be a potential approach for efficiently addressing these difficulties. The NID initiative not only simplifies daily life by combining identity numbers and giving people a unique digital identity, but it also helps to make use of the system more secure and efficient. The user can consider the solution based on this research.

Furthermore, by offering a full evaluation of the difficulties and presenting a realistic solution based on new technology, this paper contributes to the academic conversation. This study, like any other research, has limitations because the project is now just at the idea and concept development stage. After implementing the beta testing, the future study might dive deeper into certain issues, such as the NID project's potential social impact and the practicality of implementation in the Cambodian setting.

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APPENDIX 1

Questionnaire

Section 1: General question

1. Age

2. Occupation

Student

Construction/factory worker

Farmer

Teacher

Self-owned business

Staff

Policeman/Soldier

Housewife

Vendor

Other

3. Current residence, If you living in a province please select other and fill in the name of your province.

Phnom Penh

Other

4. Income

Under \$250

\$250-\$500

Over \$500

Section 2: Identification cards

1. How many cards (Credit cards, membership cards, National ID cards, driver's licenses, vehicle identification cards, bank cards, healthcare cards, vaccination cards, student IDs, etc.) do you typically carry for various purposes or daily?

Dropbox from 1 to More than 10

2. How frequently do you have to provide your identity number in various situations?

Frequently

Occasionally

Rarely

3. Where do you primarily store or keep your card? You can choose "Other" and fill in your answer. You can choose more than one answer.

- Wallet
- Bag
- pocket
- Cardholder
- Phone case
- Other:

4. On a scale of 1 to 5, How challenging do you find it to carry multiple cards?
1 - Not challenging at all 2 - Slightly challenging 3 - Moderately challenging 4 - Very challenging 5 - Extremely challenging

Scale from 1 to 5

5. What challenges do you experience when managing multiple identification cards? You can choose "Other" and fill in your answer. You can choose more than one answer. If in question number 4 you chose number 1 "not challenging at all", then this question you need to choose only 1 answer is "No challenge."

Multiple choice

- Difficulty finding the right card quickly
- Increased risk of losing or misplacing identification cards
- Confusion or difficulty in differentiating between similar-looking cards
- Limited wallet/purse space
- No Challenge
- Other:

Section 3: Identification numbers

1. How many Identification numbers do you have? Examples: ID Numbers on membership cards, National ID cards, driver's licenses, bank cards or bank accounts, healthcare card numbers, vaccination card numbers, student IDs, vehicle identification cards, etc.

Dropbox 1 to More than 10

2. On a scale of 1 to 5, How challenging do you find it to remember your identity number?

1 - Not challenging at all 2 - Slightly challenging 3 - Moderately challenging 4 - Very challenging 5 - Extremely challenging

Scale from 1 to 5

3. What are the challenges you face when trying to recall or remember your identity number? You can choose "Other" and fill in your answer. You can choose more than one answer. If in question number 2 you chose number 1 "not challenging at all", then this question you need to choose only 1 answer is "No challenge."

Difficulty memorizing the entire number
Confusion with similar numbers or digits
Spent more time checking ID number cards or on the phone
No Challenge
Other:

4. What situations do you use your identity number? You can choose "Other" and fill in your answer. You can choose more than one answer.

Filling out forms
Verifying identity for online transactions
Verifying identity for public service
Verify for benefits from the store
Verify for bank transaction
Other:

5. Have you tried any methods or strategies to help you remember your identity number? If yes, please describe the methods you have used.

Open answer