A Foresight Study of RFID Passive Tags on Smart Shopping

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Abstract: The existence of useful technology such as RFID passive tags can help facilitate all daily affairs such as not having to queue and wait for a long time to make payments at the counter immediately after shopping. This study aims to identify the challenges, trends, and future issues of the implementation of RFID passive tags from the perspective of the public in Malaysia, which will be obtained from target respondents such as generation Z based in Selangor, considering that Selangor is the most populous state. A descriptive questionnaire based on social, technological, economic, environmental, political, and values (STEEPV) drivers will be utilised to collect data from respondents. STEEPV analysis, scenario building, impact-uncertainty analysis, and descriptive analysis will be used in this study, and data will be analysed using the Statistical Package for Social Science (SPSS) version 22. The data analysed will determine the future images in the implementation of RFID passive tags in smart shopping. This research signifies whether the adoption of RFID passive tags is acceptable among people for future smart shopping.

Keywords: RFID passive tags, Smart shopping, System, Technology

1. Introduction

According to Adam Hayes (2020), Radio-Frequency Identification (RFID) is a technology that uses radio waves to identify passively tagged objects. From monitoring things along a supply chain to keeping track of materials checked out of a library, it's utilised in a variety of commercial and industrial applications. RFID tags can be passive, relying on the reader for power, or active, relying on a battery for power. Sophisticated technology like this should not be wasted simply because this system can be empowered to provide progress in the country. As a result, this technology may be used to assist humans with daily tasks such as smart shopping. RFID works by using a tiny electrical device, generally a microchip, that contains information.

Over time, humans have developed various types of technology to assist them in their daily activities. Shopping is one of the most challenging daily activities when we have to wait a long

time just to queue to pay for our products. When it is discovered to be extremely useful in speeding things up, the switch to Radio Frequency Identification, or RFID, is one of the initiatives that may be appreciated. RFID is a technology in which digital data encoded in RFID tags or smart labels are captured by a reader via radio waves. Returning to daily affairs like shopping earlier, with RFID tagging and tracking, it may not be necessary much longer. Amazon, for example, has already opened the world's first retail store without a checkout line. Instead, RFID technology tracks every item a buyer picks up and places in their shopping basket. The cost of those things is charged to the customer's Amazon account and billed as just that. We can also see from the cashless behaviour of customers. Customersthat tend to pay using cashless devices and gadgets prefer to not bring physical money as it takes space to bring wallets. It is much easier for one to bring only one device which is the smartphone where you can do online transactions with one click. Next, retailers or stores that want to use cashless payments to provide convenience to customers. Previously, only cash was accepted for shopping, then it was converted to a card, and finally, improvementsto online transactions were made. Industrial Revolution 4.0, often known as IR 4.0, drives advanced technology adoption, which has indirectly influenced RFID toll payments.

Security is the most important thing for all parties, whether online or offline. To begin with, there is the direct effect of an individual's awareness of the risk of viral transmission associated with handling banknotes and coins (Wisniewski et. al, 2021). Due to the spread ofthe COVID-19 epidemic that has haunted the world, everyone is afraid to come into contact with each other due the fear of giving or getting an infection. As a result, most people have switched to online transactions rather than making cash and coin exchanges. The low security of RFID technology is the first issue that this study has to address. This isbecause low security is what makes people want to switch to RFID. Confidentiality, integrity, and availability are basic security requirements that RFID should consider like any technology system (Abdullah M. Al-Faifi, 2013). The second issue is that customers' lack of informationor behaviour about RFID expenditure has an influence on RFID usage. This is due to the fact that many individuals do not want to pay attention to RFID technology or are unaware of it since they are already familiar with the present system. In reality, the RFID system is a globally recognised technological system. Companies operating on the worldwide market rated the system's benefits, cost of implementation, readiness to offer technical improvements, compatibility with other systems, and the ability to reduce database mistakes by deploying an RFID system as the most important (Laskowka, 2018). Furthermore, possibly one of thereasons for RFID's lack of public awareness is its acceptance. This is because the adoption of new technologies should begin with the most numerous group: young people. They will immediately introduce it to another generation after their level of trust has increased.

Therefore, to achieve the research objectives the challenges, trends, and issues in implementing RFID passive tags in smart shopping are determined. Furthermore, the key drivers related in the implementation of RFID passive tags in smart shopping also determined. Consequently, the future images on implementation of RFID passive tags in smart shopping is identified.

All relevant information and data gathered from numerous sources such as journals, related articles, the internet, and various sorts of research materials are applicable to the research. This research study's respondents will be supporters in the form of customers that come shopping. Because the target audience for this survey is those from generation Z, the target respondents will be chosen based on their age. The area to be covered for this study is independent of any shopping mall throughout Malaysia.

The scope of this study is important for future generations to see the growth of technology in facilitating daily affairs such as shopping. This is because this study can benefit not only the business establishments, but also all consumers who enter the mall in the future and the country to achieve the title of developing country. This study will focus on the use of RFID systems in shopping to facilitate

consumer affairs from time to time. All information and data will be collected through various sources, namely journals, government articles, the internet and all types of research materials related to this study. The questionnaires will be distributed to respondents as data collection analysis. This study has the potential to create a more developed country in terms of the use of technology in various daily activities.

2. Research Methodology

According to Sam Goundar (2019), research methodology refers to the systematic process of conducting research. The methodology chapter will cover all the processes that will becarried out throughout this research from the beginning to the end of the research. Bothqualitative and quantitative methods were used to analyse and evaluate the data in this study. For the quantitative method, survey forms such as those on the Google Forms platform will be shared with Generation Z respondents at the mall, while the qualitative method makes use of a foresight analysis methodology known as STEEPV. Both methods of this study are veryimportant to identify whether all the information provided is accurate. This chapter begins with the study design, and then moves on to the research flow chart, the process of foresight, population and sampling, process analysis, instrument and data collection, pilot test, and data analysis.

2.1 Research Design

Research design stands for the planning of the methods to be adopted for collecting the relevant data and the techniques to be used in the analysis, keeping in view the objective of the research and the audibility of staff, time, and money (Md. Inaam Akhtar, 2016). The study design will be mixed methodology, which will use both qualitative foresight and quantitative survey methods. STEEPV will be utilised to assess and analyse the possible drivers to identify the future trend; the detected trend will then be further analysed and studied quantitatively. The questionnaire will then be used to assess the identified main driver that affects the use of RFID systems in smart shopping. This study requires a larger number of respondents and investigates information regarding future possibilities to satisfy requirements as well as an opportunity for the future. To interpret the data, a mixed-method approach that included both qualitative and quantitative data was chosen. In this study, the trend, uncertainties, and impact of RFID passive tags for smart shopping in the future will be analysed using a mixed-based method through the foresight process. This foresight approach focused on evidence-based future thinking by employing a mixed-method approach to evaluate future trends for the adoption of RFID passive tags for smart shopping.

2.2 Data Collection

Primary data are data that are acquired and combined for a specific study objective. Although it only serves that purpose, it is first-hand data, which implies it is more specific and accurate for the entire research. The information on the driver that identifies the challenges, trends, and issues of implementing RFID passive tags on smart shopping in the future is the primary data for this study.

The goal of obtaining secondary data is to fulfil the research's second aim, and it's typically easy to come by. Secondary data is information gathered by a previous researcher without involving any subjects or respondents in the data collection process. To reach the study goal, one must be effective and precise in identifying the issue and trend. A large amount of secondary data must be appropriately evaluated to have a better understanding of a topic. Secondary data collection will be used as the first step of the research to gather basic information about the issues, challenges, and trends that influence the use of RFID passive tags as a smart shopping system. The analysis will be carried out by reviewing other sources such as journals, websites, articles, and newspapers using the STEEPV approach, which is separated from social, technological, economic, environmental, political, and values asps. The key

issues obtained will then be integrated to identify the primary drivers. Questionnaires will be created using the merged issues and drivers.

2.3 Population and Sampling

According to Pritha Bhandari (2020), a population is a total group about whom you want to conclude, and it does not always have to do with humans. It may refer to a collection of items from whatever you're studying, such as objects, events, organisations, countries, species, organisms, and so on. The target population for this study is 8,788,000 Malaysians with generation Z status (Nielsen, 2022), particularly those aged 18 to 25, as this age group is better suited to answering the questionnaire in this study. The target area for researchers is Selangor as the state is the most populous state (Department of Statistics Malaysia Official Portal, 2011).

The purpose of sampling is to draw inferences about populations from samples, we must employ inferential statistics, which allow us to identify the features of a population by actually seeing just a subset (or sample) of the population (Sampling In Research, n.d.). The data will be collected, analysed, and interpreted using a basic random sampling approach. This strategy was chosen for this study because it allows the researcher to focus on a specific group of people to conduct the test and obtain an accurate result. The Krejcie and Morgan approach will be used in this research so that an accurate determination can be made on the required number of samples to adequately represent a population. According to Krejcie and Morgan (1970), the total number of people in the sample for a population of 8,788,000 is 384.

2.4 Research Instrument

The instrument for this research is a questionnaire that will be used as the primary tool, which is organised into four sections as shown in Table 1. The reason for using this method is that the questionnaire may get a more accurate and honest answer from respondents since it is not influenced by the researcher's goal.

Table 1: Structure of the questionnaire

Section	Content
A	Respondent's demographic
B	The importance of using RFID passive tags on smart shopping
C	The impact of using RFID passive tags on smart shopping
D	The uncertainty of using RFID passive tags on smart shopping

2.5 Pilot Test

The pilot test is a procedure that is used to test the survey questionnaire before the results are collected. The reliability and validity of a questionnaire that will be produced before the actual research is carried out may be evaluated with the help of Cronbach Alpha via the use of a pilot test.

2.6 Data Analysis

This research will use three forms of data analysis: STEEPV analysis, impact-uncertainty analysis, and descriptive analysis. The questionnaire data will be analysed using the Statistical Package for Social Science (SPSS) version 22. These tools will be of use to the study in determining the outcomes of the questionnaire.

STEEPV will be used to appropriately classify all of the drivers that might potentially impact consumer preparedness. The elements are analysed socially, technologically, economically, ecologically, politically, and in terms of human value, as well as their interdependencies. Danuta

Szpilko, Ewa Glinska & Joanna Szydlo (2020) stated in their study that "The main purpose of applying the STEEPVL analysis is to identify potential driving forces in scenarios." Values, attitudes, lifestyles, consumer trends, demographic impacts, economic distribution, education, population growth, and security are only a few examples of social elements. Family, friends, coworkers, neighbours, and the media are examples of societal aspects. Technological variables include new technologies, technology effects, research, development pace, new products and processes, product life cycles, technology investments, and government research spending. Economic growth, inflation, interest rates, currency rates, taxation, unemployment, income, business cycles, global commerce, and resource availability are all issues to consider. Environmental variables include material, resources, disposal, emission restrictions, energy, transportation routes, life cycles, ozone hole impacts, and global warming. Meanwhile, political factors include policy frameworks, labour market regulations, government policies, competition oversight, legislation, political stability, tax policies, trade barriers, security needs, and subsidies (*Steep Analysis*, n.d.). Human values, on the other hand, relate to people's attitudes toward work (e.g., entrepreneurialism, career goals, deference to authority, desires for mobility (across occupations or places, for example), preferences for leisure, culture, social interactions, and so on. In this matter, STEEPV is an analysis that will give out a better decision-making outcome and application as well as foresight on the future trend. All of the factors described are crucial since they can provide future insight into a subject, allowing for a more complete approach during the study

This research will be used to identify uncertainty in forecasting future trends in Malaysian smart shopping using passive RFID tags. The STEEPV analysis drivers list gives an overview of future developments as well as the implications of evaluating the uncertain conditions. All factors will be presented following their impact and level of uncertainty on the future trends of generation Z's perspective towards the usage of passive RFID tags in smart shopping. The Impact-Uncertainty grid is a two-dimensional matrix with the x-axis representing uncertainty and the y-axis representing potential impact (on future performance).

Ayush Singh Rawat (2021) states in his writing that descriptive analysis is a sort of data analysis that helps to explain, illustrate, or summarise data points in a constructive manner so that patterns might develop that fulfil all of the data's conditions. The researcher is only concerned with describing the situation or case they are studying. Descriptive research is based on theory; therefore, the findings are more accurate and dependable, which aids others in understanding the necessity of the study.

3. Literature Review

This chapter will evaluate all past studies linked to this topic as well as the trends discussed in the usage of RFID systems. The literature review can help in building knowledge in our respective fields. Important concepts, research methods, and experimental techniques used in a particular field will be able to be learned. We will also explore how researchers apply the principles we learned in our course to real-world challenges. These studies include sources from documents, journals, or even books that can provide information that allows this research to be completed. This chapter will also feature the STEEPV analysis to help with the research. According to Literature Review Purpose by The Western Sydney University Library (2017) has stated that "The purpose of a literature review is to gain an understanding of the existing research and debates relevant to a particular topic or area of study, and to present that knowledge in the form of a written report." As a result, the literature review may explain the reinforcement of this research investigation.

3.1 The Evolution of RFID

RFID technology has received a lot of attention in recent years. The use of single-chip radios to tag physical objects – people, places, and things – so that they can communicate with computers has been

a significant driving force behind its development. Radio-frequency technology has gone a long way since its inception in the 1920s. RFID, or radio frequency identification technology, is an important part of modern society because it uses electromagnetic energy to automatically sense and track data in a variety of applications, ranging from network and building security to inventory and sales monitoring to preventing auto theft, tracking library books, and operating unmanned toll booths. The system works by sending radio waves between a "tag," which can be a sticker, or a data card affixed to a person, animal, or item, and a "reader" or scanner. This enables accurate, efficient, and remote tracking or monitoring of things based on data stored on tags.

3.2 Advantage and Disadvantage of Radio-Frequency Identification (RFID)

RFID systems are applied in a variety of industries, including construction, engineering, chemical, manufacturing, and retail. RFID technology has several advantages and disadvantages in different industries.

(a) Advantage of RFID

Security is one of the advantages of RFID systems because that systems require specialised equipment to read the data, and the data is typically secured. This contributes to the lock system's security. Munoz-Ausecha C. *et al*. (2021) stated in their study that we can use RFID to track and secure individual objects in a variety of contexts all around the world. Depending on the conditions and requirements, the technology offers a variety of pricing choices. One of the advantages of RFID is that it just takes a fraction of a second to unlock the security system by placing an RFID key nearby. The operation is quite simple and quick. That's why convenience may be one of the great benefits of RFID. Next, the card's size is convenient and comparable to that of a standard bank card. As a result, it is simple to store. Users are less likely to forget these cards while heading to a location where they need access. RFID cards are simple to use and store. RFID locks are available in a variety of cam and spindle lengths to fit a variety of doors and furniture, making them appropriate for a variety of businesses and applications. That's the advantage of RFID which can be said to be diverse. Finally, RFID has an advantage for master card functionality. For example, a single RFID key card might be used to program many locks. This eliminates the need for users to carry several cards for different locks while allowing each lock to have its own set of access regulations.

(b) Disadvantage of RFID

One of the RFID system's disadvantages is the possibility of hacker involvement. The RFID technology can be hacked by a tech-savvy individual, posing a security risk. As a result, hacker alarms must be implemented to maintain system control. Next, RFID is expensive to set up. RFID setup is costly and time-consuming. Locks must be wired with a security system that can be accessed, controlled, and logged through the computer system as part of the setup.

3.3 Generation Z

Generation Z or known as Gen Z, iGen, or centennials refers to the generation that was born between 1997-2012, following millennials. This generation has grown up with the internet and social media, with some of the oldest students graduating from college and joining the workforce by 2020 (Andrew Molla, 2022). Before their twelfth birthday, the average Gen Z received their first smartphone. They typically connect through social media and text messages, and they spend as much time on their phones as older generations do watching television.

(a) Characteristics of the Z Generation

According to Andrew Moela (2022), by 2026, Generation Z will have become the most influential generation in the retail industry, with many of them having enormous purchasing power. Retailers and

brands must begin cultivating relationships with Gen Z today to acquire a piece of this rapidly rising demographic. Gen Z, on the other hand, is distinct from previous generations in that they are the first customers to have grown up entirely in the digital era. They're tech-savvy and mobile-first, and they hold themselves to high standards when it comes to how they use their online time.

3.4 STEEPV Analysis

In this part, STEEPV will be utilised to delve deeper into the main concerns, issues, and trends in Malaysian consumer readiness for the use of RFID passive tags for smart shopping. The STEEPV aspects of social, technical, environmental, economic, political, and values will be utilised to categorise the issues, challenges, and trends. Table 2 shows the output of the STEEPV analysis:

Table 2: Output of STEEPV Analysis

Factors	Total
Social	6
Technological	6
Environmental	4
Economic	2
Political	2
Values	3

3.5 Table with Merged Issues and Drivers

The STEEPV analysis has identified major issues and drivers for the future images on the implementation of RFID passive tags in smart shopping. All merged issues and drivers are shown in Table 3.

Table 3: Merging of Issues and Drivers

No.	Key Drivers
1.	Saving time
2.	Various advantages
3.	A data storage system
4.	Technology for competing
5.	Increase store profitability
6.	Safer than barcodes
7.	Saving labour and staff reductions
8.	Young people's exposure to technology
9.	Industrial Revolution 4.0 drives advanced technologies
10.	Environmental and social sustainability implications
11.	Enhanced purchasing security
12.	Potential customers for future development

4. Results and Discussion

This chapter focuses on study findings based on a collection of questionnaire data that's been distributed to identify the challenges, trends, and issues with implementing RFID passive tags in smart shopping and to determine future trends with the aid of social media tools. The data collected and

analysed is based on the findings of the distributed surveys. SPSS was used to analyse the data collected to obtain the overall demographic background information and the mean of the influence factors and level of impact uncertainty. The mean of the influence variables and the level of impact-uncertainty were organised in order, and the highest mean was obtained for impact-uncertainty analysis to determine the most impactful and uncertain drivers in the future. Finally, in Chapter 5, the two drivers with the highest impact and uncertainty will be used to develop the scenario analysis.

4.1 Results

(a) Response rate

The survey return rate achieved for the research is shown in Table 4.3. Following the pilot test, the researcher continued the research by distributing questionnaires to the respondents. Throughout the data collection process, the questionnaire was distributed to around 200 respondents through social media, however, the researcher received approximately 150 valid and filled-out questionnaires. All of the questionnaires were distributed via WhatsApp and other media platforms such as Facebook and Instagram. 150 out of 384 required respondents had been collected with a response rate of 39.06%.

(b) Demographic information

This section analyses and discusses the demographic respondents. The information includes gender, age, race, state, education level, occupation, frequency of shopping in a week, consent to line up and wait to make a payment process, knowledge about RFID passive tags, agreement on RFID passive tags can solve the problem, and agreement on the implementation of RFID passive tags in shopping can be a beneficial technology in the future. The data obtained was measured using the frequency distribution, and the overall profile of the respondents is shown in the chart.

Table 4: Demographic information

Item	Frequency	Percentages (%)
Gender		
Male	71	47.3
Female	79	52.7
Age		
18-24	94	62.7
25-34	18	12
35-44	12	8
45-54	25	16.7
55-60	1	0.7
Race		
Malay	144	96
Chinese	3	2
Indian	1	0.7
Others	2	1.3
State		
Johor	22	14.7
Kedah	6	4
Kelantan	13	8.7
Negeri Sembilan	14	9.3
Pahang	3	2
Perak	1	0.7
Perlis	3	2
Selangor	43	28.7
Terengganu	6	4
Melaka	2	1.3

Pulau Pinang	2	1.3
Sabah	0	0
Sarawak	2	1.3
Wilayah Persekutuan Kuala Lumpur	8	5.3
Wilayah Persekutuan Putrajaya	25	16.7
Wilayah Persekutuan Labuan	0	0
Level of Education		
Ph.D.	1	0.7
Master	3	2
Degree	99	66
Matriculation/STPM/Foundation/Diploma	38	25.3
High School/SPM	3	2
Others	6	4
Occupation		
Student	82	54.7
Unemployed	3	2
Self-employee	3	2
Government	38	25.3
Non-government	24	16
The frequency of shopping in a week at the mall		
1-3 times	130	86.7
4-6 times	16	10.7
7-9 times	3	2.0
More than 10 times	1	0.7
The Consent to Line up and wait to make a payment		
Yes	20	13.3
No	130	86.7
Knowledge about RFID passive tags		
Yes	106	70.7
No	44	29.3
Agreement on RFID passive tags can solve the problem		
Yes	128	85.3
No	22	14.7
Agreement on the implementation of RFID passive tags in shopping can be a beneficial technology in the future		
Yes	140	93.3
No	10	6.7

The tabulated demographic information are as follows. There are 150 valid respondents involved in this study out of 384 sample size respondents. Firstly, majority of the gender for this study were female at 79 (52.7%) respondents while male respondents are at 71 (47.3%). Next, most of the respondents are of the young adults age group which were the age group of 18-24 years old at 94 (62.7%) respondents while only one respondent for the age group of 55-60 years old. Thirdly, majority of the respondents are of Malay ethnicity at 144 (96%), while the least was Indian ethnicity at 1 (0.7%) respondent. Next, most of the respondents came from the state of Selangor at 43 (28.7%) respondents while the none was coming from the state of Sabah and Wilayah Persekutuan Labuan. Also, most of the respondents are still or have finished Degree level of education at 99 (66%) respondents while the least had finished P.hD. at 1 (0.7%) respondent. In addition, most of the respondent's occupation is as a student at 82 (54.7%) respondents while the least is as self-employee and unemployed at 3 (2%) for both.

Next, this part will be explaining on the demographic information on knowledge of RFID passive tags on smart shopping. Firstly, most respondents have chosen the shopping frequency of 1-3 times a week at the mall. Secondly, many of the respondents do not agree to line up and wait to pay for their goods. Next, most respondents know about RFID passive tags. Then, most respondents agree that RFID passive tags can solve the problem. Lastly, most respondents also agreed that the implementation of RFID passive tags could be a beneficial technology in the future at 140 (93.3%) respondents while the least maybe disagreed about that at 10 (6.7%) respondents.

(c) Impact-uncertainty analysis

Impact-uncertainty analysis had been carried out in this research. The purpose for this analysis is to determine the highest mean between drivers of impact and uncertainty. Table 5 shows the mean of 12 leading drivers for impact and uncertainty. The highest mean of impact and uncertainty can be indicated by the scatter plot where the farthest point from the origin or to the most right were the main drivers. Figure 1 shows the construct of both impact and uncertainty.

Table 5: Mean of 6 leading drivers for level of impact and uncertainty

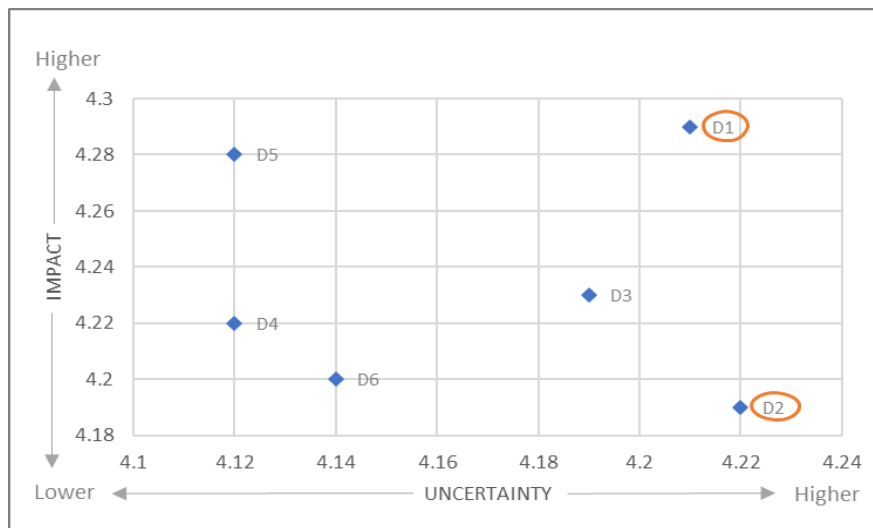| No	Issues and Drivers	Impact	Uncertainty
1	Saving time	4.29	4.21
2	Young people's exposure to technology	4.19	4.22
3	Enhanced purchasing security	4.23	4.19
4	Technology for competing	4.22	4.12
5	Industrial Revolution 4.0 drives advanced technologies	4.28	4.12
6	Environmental and social sustainability implications	4.20	4.14

Figure 1: Impact-uncertainty analysis

The data in Table 5 were utilised to create the impact-uncertainty analysis to identify the drivers having the highest impact and uncertainty in the prospect. Figure 1 shows the result of the analysis. The top two drivers with the highest impact and uncertainty will be chosen. Coordinates of D1 (4.21, 4.29) and D2 (4.22, 4.19) were selected as D1 is the driver with the highest level of impact while D2 is the driver with the highest level of uncertainty. It represents two drivers of the 'need to save time' and the 'need to expose young people to technology' respectively. Thus, these two drivers were selected as the top drivers, and this would be used to generate scenarios building analysis for the implementation of RFID passive tags on smart shopping.

4.2 Discussions based on the First Research Objective

The first objective is to identify challenges, trends, and issues in implementing RFID passive tags in smart shopping. The Issues, Challenges, and Trends are crucial in determining which factors will have the most impact in the future. Finally, the top two primary Issues, Challenges, and Trends were acquired and chosen based on the impact-uncertainty study, with both Issues, Challenges, and Trends becoming the most influential and uncertain in comparison. The selected top two drivers will be discussed in the following section. It describes how uncertain it is towards the future development and what impact will exist on the future implementation of RFID passive tags on smart shopping in Malaysia.

(a) Need to save time

In comparison to the other drivers, this driver received the most votes for importance while also being the most impactful. It had a score of 4.21 and 4.29 in terms of uncertainty and impact respectively out of the total score of 5.00. In the respondents' opinion, the necessity to save time is the most important since the presence of RFID passive tags is the best option for speeding up all movement procedures in the mall. Consumers tend to get increasingly impatient as their time constraints increase (*View of Time Pressure, Time Saving and Online Shopping: Exploring a Contradiction*, 2009). This shows that a person will try to find another way to survive rather than spend their time on something that is not beneficial for them. It is obvious that if RFID passive tag technology is available, people will use it rather than continue to queue and wait at the payment counter. According to Pettit (2021), time management skills that are effective make things simple and easy. This is because people who have control over their time are more confident and capable. Good time management ensures that you are clear and confident about how you are spending your time. The existence of RFID passive tags on every product will make our time more organized when we don't have to spend our time going through the payment process like others. Therefore, we will no longer feel overwhelmed, stressed, or frustrated for fear of wasting our time.

(b) Need to expose young people to technology

The need to expose young people to technology received the second highest vote for Issues, Challenges, and Trends based on importance, with the second highest mean score when compared to the other Issues, Challenges, and Trends. Its score value is 4.22 and 4.19 out of 5.0 in terms of uncertainty and impact respectively. The necessity to expose young people to technology will become the second most impactful, and uncertainty about RFID passive tags on smart shopping will become the second most impactful in the future. Given the rapid evolution of technology, an adolescent has the challenge of learning how to use various devices and applications (*4 Benefits of Technology for Teens*, 2021). It also states that as new applications and technological developments emerge, a youngster applies problem-solving fundamentals to each new challenge, which will eventually pay off in the "real world." In any case, whether they like it or not, they must be exposed in that way because they are the generation that will grow up with the increasingly rapid use of technology in their environment. Exposing the child to technology at a young age is a proven method of disciplining children and self-motivation, both of which are essential for the child's future development (Sesan, 2017).

4.3 Discussion based on the Second Research Objective

The second objective of this research study is to explore the future images in the implementation of RFID passive tags in smart shopping. It is possible to identify which trends or acts will be the driving force for future development, as well as how they will influence the future environment and market for RFID passive tags on smart shopping. The top two Issues, Challenges, and Trends from the impact-uncertainty analysis will be used to build the four different alternative scenarios, as shown. These

scenarios will provide insight into four distinct possibilities that may occur during the next ten years. Last but not least, the four possible scenarios are depicted in Figure 5.1, as shown below, and each of them will be discussed, regardless of whether the result is positive or negative. The scenarios of the emergence of new normalisation, low or no adoption of RFID, lack of promotion and hesitation have been further demonstrated and discussed on the possible implications.
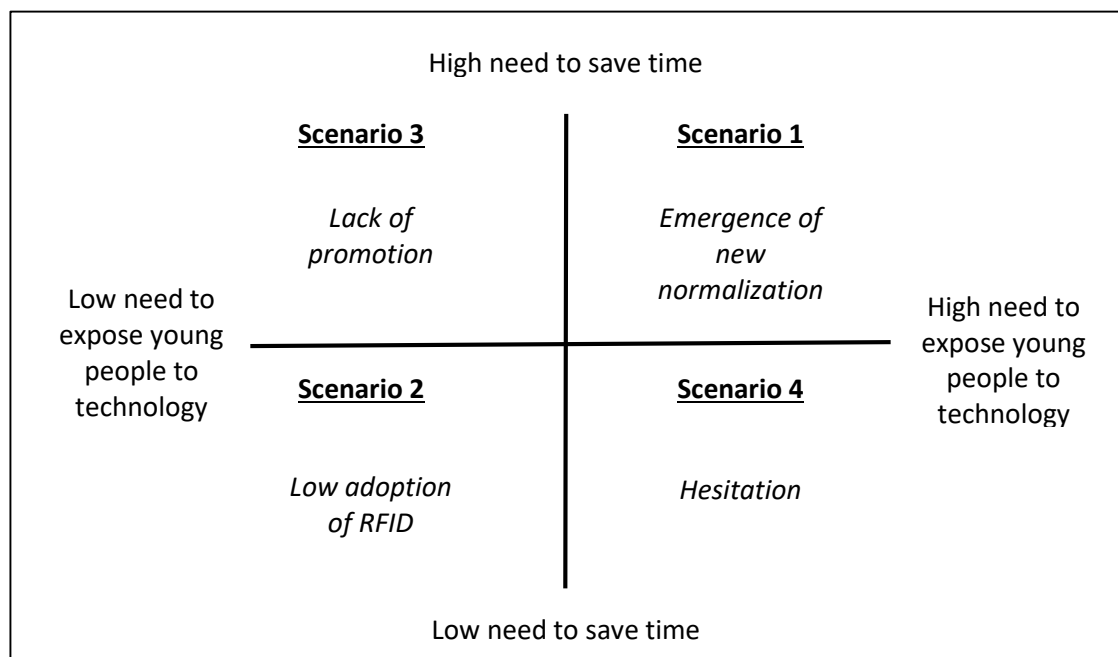
(a) Scenario 1 (Emergence of new normalization)

High need to save time

Scenario 3	**Scenario 1**
Lack of promotion	*Emergence of new normalization*
Scenario 2	**Scenario 4**
Low adoption of RFID	*Hesitation*

Low need to expose young people to technology

High need to expose young people to technology

Low need to save time

Figure 2: Four Alternative Scenario

The first scenario is the best scenario that occurs when there is a high need to save time and a high need to expose young people to technology. It will give birth to a new type of normalisation where RFID passive tags thrive as the main medium of smart shopping. The term "new norm" refers to a situation in which the usage of RFID passive tags at a mall while shopping is seen as a normal regular thing. When consumers have a high awareness regarding the environment and want a change in a more positive direction, they are ready to substitute their choice to the use of an RFID passive tags system which they believe can facilitate their daily business in shopping. So, the emergence of new norms will occur due to technological advances that will benefit the environment and consumers themselves.

Developed countries have long been using RFID technology in improving their economic sectors because it is believed to help a business to achieve profit. Research from Nilesh Unde *et al*. (2015), stated that RFID community awareness has been fine-tuned in recent years as the US Department of Defense (DoD) and retail giant Wal-Mart required that its suppliers adopt RFID technology. RFID is the best choice for the globalisation era since it has advanced beyond barcodes. RFID tags, like barcodes, have unique identification numbers encoded in them but then they can be read from a distance, even outside of the line of sight.

RFID will improve inventory accuracy, resulting in a better in-store shopping experience for customers, more online and in-store pickup capabilities, and increased sales opportunities (Kay, 2022). It is time for the industry to begin using the innovation, for example, RFID in different applications, for example, fabricating, and storing purposes.

Furthermore, this new norm mostly uses technology for self-help rather than requiring human workers for assistance for any payment purpose. For example, any franchise that actively uses the kiosk system to order meals and continue to make payments online and still using the debit card system. RFID chips are already being used on credit and debit cards, allowing the card to be read without having to be scanned by a machine. RFID credit cards are one-of-a-kind high-tech cards that have advanced the banking industry. People have begun to utilise it for a variety of applications due to its convenience and comfort (Wallester, 2022).

As a conclusion for scenario 1, the "Emergence of new normalisation" would be known as the best scenario in the future of RFID passive tags when compares with another three scenarios. This is because we will be heading into a new era where all our daily activities will be related to the use of technology which is growing from time to time.

(b) Scenario 2 (Low adoption of RFID)

In scenario 2, low adoption of RFID happens when there is a low need to save time and a low need to expose young people to technology. This scenario is where society perceives that there is no need for RFID passive tags while the generation is not knowledgeable about technology. This is the worst scenario in terms of development in the economy because society does not have the resources or knowledge to innovate new technology to implement RFID passive tags in shopping after considering that it only has a low use in daily life. Therefore, the economic sector will remain unchanged and continuous in terms of the technology used.

Society or the enablers of technology are not interested in growing their knowledge of RFID passive tags and continue to ignore any opportunities to learn more about the implementation of RFID passive tags in smart shopping. This happened also probably because the generation at that time did not catch up with time. After all, they worked in rural areas. The use of technology there is also not that wide which causes young people there are also not exposed to technology.

In a nutshell, scenario 2 is the worst-case future scenario. The future researcher or developer must prepare in advance to avoid scenario 2. The second scenario might occur due to the unusual challenges imposed by the adoption of higher-level technologies and the existence of communication, engagement, and consumer satisfaction problems inside RFID passive tags on smart shopping.

(c) Scenario 3 (Lack of promotion)

The third scenario occurs when there is a high need to save time and a low need to expose young people. The lack of promotion from organizations involved in the production of RFID passive tags causes people to be unaware of the existence of such beneficial technology. Scenario 3 would, on the other hand, be regarded as the medium well scenario for the future.

The importance of promotion is to increase the speed of product and service acceptance, aid in the sales of goods and services in imperfect market conditions, aid in facing industry competition, increase the standard of living and others (*General Data Protection Regulation (GDPR) Guidelines BYJU'S*, 2021). In this scenario, the situation is different where they know the importance of saving time but they are not aware of the existence of RFID passive tags technology that can benefit them.

In conclusion for scenario 3, it is known as the medium well scenario. Industry 4.0 is a fourth revolution for the new era while there is a high rise in the adoption of RFID passive tags in the industry worldwide.

(d) Scenario 4 (Hesitation)

The last scenario was generated by the low need to save time and the high need to expose young people to technology. This hesitation develops because young people are hesitant to use current technologies. Scenario 4 would be the same as scenario 3 which is known as medium well for the future of RFID passive tags.

Furthermore, they may hesitate to use technology because they do not have the appropriate device. Therefore, the technology cannot be explored properly. Having the right device can make them close to technology such as the use of RFID passive tags when shopping. RFID labels should be attached to each item in the shopping mall. The corresponding encryption is detected as soon as the consumer places the products in the cart, and the cost of the related commodities is saved in the storage unit (Nemalidinne Sai Megana, 2018). Finally, scenario 4 will be known as the medium well scenario. Both analysis statements are a total match for scenario 4 which is "Hesitation".

5. Conclusion

In conclusion for this research study, it has successfully implemented results for two specific objectives which are to identify challenges, trends, and issues in the implementation of RFID passive tags in smart shopping and to determine the future trends in the implementation of RFID passive tags in smart shopping. Aside from that, this fo resight study will assist developers and users of RFID passive tag technology in increasing their perception, awareness, and recognition of the economic sector's future uncertainty. Future researchers or developers will be able to use this study as a reference since it will give information concerning the influence and uncertainty regarding the use of RFID passive tags on smart shopping. Therefore, future researchers or developers can optimise the positive effects of RFID passive tags technology on smart shopping while avoiding the negative effects. Hopefully, in the future, the use of RFID passive tags in smart shopping can be implemented as soon as possible to make the world more advanced and modern, so it can bring many benefits to the world in various types of industries.

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