

# A Suitable B2C E-Commerce Model for Elderly Thai People

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**Abstract** - Internet technology has been playing a significant role in human society helping all ages, including the elderly which are becoming more and more interested in learning and using new technologies, but such old people may not be quite familiar with the technology. Therefore, if there was a proper study and development to make the technology easy to use among the elderly, these people could then be able to live in this new modern society. This research studied a suitable B2C e-Commerce model as it is directly associated between the entrepreneurs and the consumers through the internet. The researcher selected mixed-methods research to construct the model. After that, the typical B2C website was developed under the studied style. Black-box behavioral test was chosen to evaluate and assess results obtained from the samples; these samples were very satisfactory.

**Keywords** - E-Commerce, B2C, Elderly Thai People

## I. INTRODUCTION

Internet technology plays a significant role in human society and exists in several forms; one of these is an e-Commerce. Currently, organizations or stores include e-Commerce as one part of their own business operations to help increase marketing channels and for public relations of goods and services. E-Commerce can reduce the distance of limitation in deals and reduces the transactional time since the enterprise does not have to worry about location, place of

business, warehouse, showroom, and salespersons, thus reducing managerial cost significantly [1, 2]. The general e-Commerce that is involved with internet users at present includes: 1) Business to Consumer (B2C), 2) Business to Business – (B2B), and 3) Consumer to Consumer (C2C) [3].

B2C e-Commerce in China has continuously grown, especially among the consumers who live in the sub-urban area and in remote areas because such customers have buying power but it is not convenient to traveling because of the inconvenience transportation [4].

In Korea, B2C e-Commerce business is in the form of retailer between business and retail customer or personal customer [5].

In Thailand, it has been found that most e-Commerce, about 75 %, is B2C which are small businesses, 55 % of these have registered capital of less than 500,000 baht, and use marketing directly to the consumers [6].

Among these customers, although teenagers generally use modern technology to buy online-goods, the trader or e-Commerce business owner should not ignore elderly customers. According to a study in the U.S., it was found that the population aged of more than 50 years old is about 78 million people who are educated, familiar with technology, and are eager to spend money through an online system and want to use new goods and products [7].

Although normally, the elderly are not familiar with learning or exchanging knowledge on how to use information technology such as computers and the Internet, the research on the elderly and the use of information technology was conducted [8] and discovered that the elderly still want to learn about new technology and communication if they are designed for them appropriately. According to the above information, it was found that the elderly tends to be interested in using online media in form of websites. However, there is still no research that studies only concerns and issues presented by B2C e-Commerce appropriately and especially to the elderly Thai people.

## **II. RELEVANT LITERATURE AND RESEARCH**

The trend of Thai society focuses on taking care of the elderly. So, this research studied and synthesized the key issues through relevant literature and research.

### ***A. Relevant Theories and Techniques in Designing Websites***

Nielsen [9] said that 43 % of the website users are 65 years old or over with a slower ability of using websites than the young. If the requirement to allow the elderly to use a website easier is required, then the design must be done in the way that favors them. Also, Finn [10] said that there should be consideration of characteristics of the elderly if the design is to be made for them to use.

One significant rules was how to use color: color plays an important role in presenting uniqueness of the website of the organization, business or agency, and it must be appropriate for the elderly as well. Similarly, Sureerat [11] provided suggestions on how to choose proper color for graphic work in that the color should be limited to be only 2-3 shades of color, and style of color expression or graphic pictures expression should be limited for speed when presenting data.

The Printing House [12] had presented data that focused on how to use color appropriately

with users. It was found that people who are 51-59 years old and over 70 years old would have 1 similar favorite color that is light blue.

Moreover, the alphabets that can be clearly seen by the elderly are blue letters on a white background. For the black and white color choice, it was found that the clarity for vision was black letter on a white background [13].

Kennedy [14] said that when designing a website at present, the view of the designer can be classified into 2 groups: 1) UX Designer (User Experience) and 2) UI Designer (User Interface). When developing a website for a group of people, such as for the elderly or disabled it must be easy for them to use but not necessary to look attractive. When the UX group develops a website to be easily used, it is necessary to learn the UI as well. Kennedy [14] provided samples of 7 rules to design UI to be attractive consisting of: 1) the design shall take direction of light into consideration, 2) Use of the color black-white (grayscale) first before adding color simplifies which are the most complex elements of visual design, 3) the need to add a lot of white space on the screen, 4) the lay of letters over pictures, 5) the increase-decrease of dominance of the letter, 6) the letter should be chosen appropriately, and 7) learn from existing well-designed websites and applied to yours.

The proper selection of font would help the elderly feel at ease and help them to read messages or contents on the website easily and conveniently. It is found that the font without head (Sans Serif Style) is a good font that would make the readers feel convenient, comfortable as it is not too formal [15].

Shneiderman [16] presented 8 golden rules for interface design as follows: 1) Strive for consistency, 2) Enable frequent users to use shortcuts, 3) Offer informative feedback, 4) Design dialogue to yield closure, 5) Offer simple error handling, 6) Permit easy reversal of actions, 7) Support internal locus of control, and 8) Reduce short-term memory load.

For the design and development of a website for the elderly under the way of WCAG 2.0 (Web Content Accessibility Guidelines), the developer must study and understand WCAG 2.0 because WCAG 2.0 is an online standard [17].

National Institute on Aging Information Center (NIHSeniorHealth) [18] provided suggestions on the development of websites to be familiar and easy-to-use for the elderly. The data should be divided into short parts and put key issues at the top. The data presentation, button, icon, and symbols should be uniformly consistent for the whole website. Buttons should be designed to be large, the letter should be of large size and the color should be clearly seen.

For the technique of checking for quality of a website design to ensure it is attractive and interesting to attract viewers, a website designer is required, ZURB Notable website [19] presents an easy technique to criticize websites within a short time (not more than 30 seconds) by dividing it into various issues as follows: 1) Note where your eyes go first, 2) Squint your eyes, 3) Scan the page diagonally from top left to bottom right, 4) The "Five Things" trick, and 5) Find the intersections.

### **B. Mixed Method Research**

Mixed Methods research is related to collecting, analyzing, integrating, or mixing data in qualitative and quantitative terms. These help the researcher to easily understand the problem or issue that are being studied [20] and can reply to the problem overall more clearly than the use of one single technique [21]. Moreover, this method is accepted and discussed among many researchers, for example, Johnson & Onwuegbuzie [22] stated that the mixed method research is the one that consists of technique, concept, language use, data in quantitative and qualitative terms when conducting research. Oburai, Wai and Baker [23] also employed this mixed method of research to conduct social science research as well. Biddix [24] also stated the prominent point in that the mixed method research would help the researcher to be able to explain and

convey meaning in research framework and could make it easier for the researcher to write findings.

Stecker, McLeroy, Goodman, Bird, & McCormick [25] stated the application of mixed method research usage in many forms such as the collection of data from focus groups, the use of questionnaires, in-depth interviews, where the qualitative and quantitative methods can be used together to help reduce error of the data (cross-validation) as well.

From the above reasons, this research selected the mixed method research as the research methodology guideline in studying and developing a B2C e-Commerce model that is appropriate for the elderly as follows:

### **C. Concerned Research**

In studying and developing the B2C e-Commerce model that is appropriate with to the Thai elderly, related work from other researchers was used as a guideline for the development of this research; for example:

Dong Da-hai, Liu Sheng-nan, Jin Yu-fang and Qi Hui [26] analyzed the quality of website that affected customers' satisfaction towards an e-Commerce website and the loyalty of customers towards such website, it was found from the research that the quality of a website is effected by content, usage, security, and attraction of the website. It was found from the study that all issues are important to customers' satisfaction and loyalty, except for the content and the usage which was found that a new customer would be more concerned about the usage; if the website is complicated to use, it would considerably affect satisfaction and loyalty. In this study, the data collection was done by using an online set of questions. The theory of question design was in the style of Likert Scales for 7 scales.

CAO Bin, YE Qiang [27] conducted research into B2C E-Commerce's customer relationship management based on the Long Tail. A few parts of this research revealed that

B2C e-Commerce is popular among customers since it is easy and convenient when ordering goods. In order to sell goods to the customer, it was based on the management of customer relations. Moreover, the classification of customers was found to be important as it would make business operated in the way that corresponds to the goal.

B2C e-Commerce is also interesting. Yangcheng Hu [28] studied the data in quantitative terms by collecting data from questions focused on the impacts of service quality and customer satisfaction on customer loyalty in B2C e-Commerce. It was found from the study that these issues are associated with e-Commerce significantly.

In addition, from other Thai researches, it was found that the characteristics for elderly design should be simple (simplicity) but not too “basic”. The key point is the design should focus on casual style and unofficial format, the color must be in the same direction, inclusion of pictures or icons, the size of the letter button must not be too small or too big. The elderly are concerned with privacy issues referring to personal information that they do not want to reveal in public [29].

### III. RESEARCH METHODOLOGY

#### A. Studying and Collecting Related Data

The relevant literatures and researches were analyzed and synthesized. These were then used to design the research tools. Fig. 1 shows the research methodology framework.

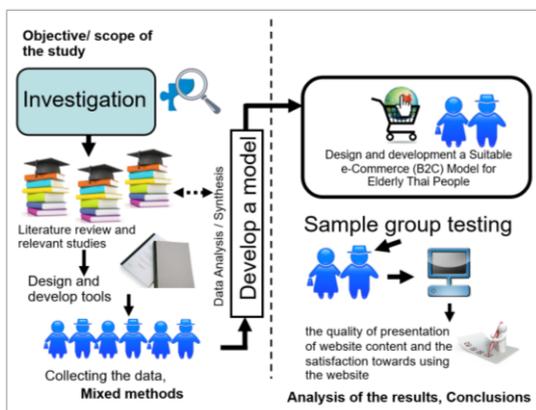


Fig. 1 Research Methodology Framework

#### B. Collecting Data Using Techniques of Mixed Methods

The particular tools in this study were: 1) semi-structural in-depth interview manuscripts and 2) the questionnaire survey. The sample were selected by purposive sampling.

1. The qualitative data were collected using in-depth interviews conducted with 6 samples of elderly Thai people.

2. The quantitative data were collected from the questioners. They were 60 elderly Thai who live in Bangkok and its perimeters.

These data were analyzed and synthesized in order to develop a B2C e-Commerce Model that is appropriate for the Thai elderly.

### IV. A SUTTALBE B2C E-COMMERCE MODEL FOR ELDERLY THAI PEOPLE

It was found from the study that the form of B2C e-Commerce that is appropriate with the Thai elderly should have 4 aspects of key issue, shown below:

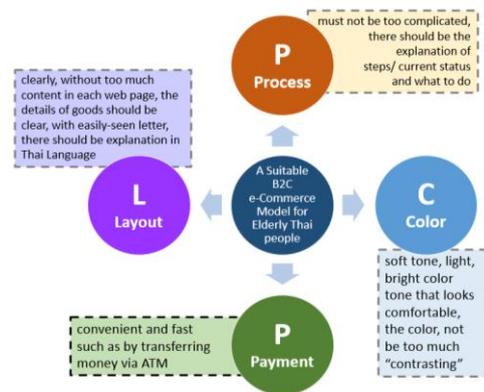


Fig. 2 A Suitable B2C E-Commerce Model for Elderly Thai People

1. The process, which must not be too complicated, there should be the explanation of steps/ current status and what to do.

2. Layout should be done clearly, without too much content in each web page, the details of goods should be clear, with easily-seen letters, there should be an explanation in the Thai Language.

3. Colors should be in cool and soft tones,

that looks comfortable, the color must not be too “contrasting”. There can be colorful colors with bright tones but it should be light such as light blue, white, light green.

4. Payment method: the elderly chooses to pay by transferring money via ATM which is convenient and fast and not too complicated.

## V. DEVELOPMENT OF A B2C E-COMMERCE WEBSITE FOR ELDERLY THAI PEOPLE

The prototype B2C e-Commerce website was developed based on the model that is appropriate with the Thai elderly. Details shown on the sample monitor screen were as follows:

Fig. 3 is the Homepage of the website. When the elderly opens the browser, the elderly will find that the website is designed in a clear manner, with light blue color, clear letters, with no “head” thus making it easily to be seen, there is space between letters, at the top of the website a menu is located designed to be read easily, (there is no hidden menu), all menus appear clearly, in the key topic there is on Icon to help convey meaning and to look more interesting, there is no use of symbol buttons with frequent blinking or noise to disturb the elderly during usage.

On second part, it is the large slide pictures showing samples of goods. These slides would be moved with the sufficient space so that the moving would not be too fast. However, the user can use the button to move forwards or backwards as desired.

On the third part, it is the status bar showing working procedures that would help the elderly to know what step he/she is at now and how many steps are left to complete the purchase from this website. It is divided into 4 easy steps.

On the fourth part, it is the area showing the new best selling goods and all goods.



Fig. 3 The Homepage of B2C E-Commerce Website

## VI. TESTING RESULTS CONCLUSION

In this test and assessment, Black box testing was performed with 30 samples, activities tested 2 aspects as follows: 1) the quality of presentation of website content [19] and 2) satisfaction towards using the website with a rating scale questionnaire under the Likert’s principle [31].

### A. The Result of Testing Quality of Website

It was found from the test of quality of the website that the first thing the elderly of 70 % saw was name of store, secondly for 23.3 % saw was the large-size products that can be moved, and 6.6 % saw an explanation on purchasing goods in 4 steps.

The thing that the elderly could see most clearly on the webpage was the large-size picture of goods that can be moved forwards and backwards, equal to 60 % of the number of tested elderly and 30 % mostly saw the name of store.

To scan the page diagonally from top left to bottom right, 86.66 % of them could tell what the main topics are presented on the page in a logical order correctly.

When observing types of goods available on the website, the elderly of about 90% answered that the website's products were about herbs.

### ***B. Result of the Test into the Satisfaction towards Use of the Website***

The satisfaction towards overall picture and design of the webpage had a high average level of 4.37 with standard deviation of 0.51.

For the means of satisfaction towards the steps of website usage and satisfaction towards the security on the website, both were at a high level with the means of 4.07 and 4.20, with standard deviation of 0.41 and 0.59 respectively.

## **VII. DISCUSSION**

The result of the research into a form of B2C e-Commerce which is appropriate with the Thai elderly found that the elderly need something easy to use without complicated procedures, which must be appropriate in the layout of data and be easy and convenient to use and see. This point is consistent with the confirmation from the National Institute on Aging Information Center [18] that had provided suggestions on the development of website which is familiar and easy to use by the elderly in that data should be divided into short parts, the layout should be arranged to be appropriate, with the increase of whitespace, focusing on simplicity and clarity and suiting the eyes, which is the popular modern design as well [14]. This result is also consistent with the research by Dong Da-hai, Liu Sheng-nan, Jin Yu-fang and Qi Hui [26] who stated that the new customer would be mostly concerned about the complexity that would affect their satisfaction and loyalty considerably; therefore, the complexity of content should be decreased by reducing the quantity that is unnecessary, with less steps so that it would be easy to remember in the short-term memory. This is consistent with the statement of Ben Shneiderman [16] as well. Therefore, this research had applied the points that was found to help when designing a website in order for effective testing and assessing. The website

was designed to have only 4 steps when purchasing goods and on the webpage there was a sign showing status and procedures that the user was working on, including the rest of the steps to be performed to complete the process. On the point of design of webpage and on the usage of website in pictures, the satisfaction was at the highest level.

The use of font was also a fact that would help display results of content which is appropriate, the letter must look comfortable, and suit the eyes which made it easy to read. When comparing between the letters with a head and without, it was found that the letter without a head would make the reader feel comfortable. Therefore, in developing the website, the Sans Serif was chosen and the elderly were satisfied with this.

Using color is also a key point. It was found from the study that color "cool" which is a light tone, looks comfortable and the color which is not too contrasting. There can be colorful colors with bright tones, but it should be light such as light blue, white, light green. There were also other results from other researches that support the result of this study in the same direction; for example, the color must be in the same direction, there should be a limit of only 2-3 colors [11]. The person whose age is 51-59 and 70 years old and over like light blue or blue [12]. In this experiment, the researcher selected to use light blue and white color as the main tone in the designed website; the white color was used as a background and the light blue would show the topic. According to the result of the experiment, it was found that the users were satisfied at a high level referring to color.

On the part of payment method, it was found from the research that the elderly would choose to pay for goods by transferring money via ATM, giving reason that it is fast and convenient without too much complexity, and currently the banks have facilitated the customers by increasing ATMs in various spots.



**Fig. 4** Testing and Assessment Process by Sample Groups

## VIII. LIMITATION OF THE RESEARCH

In this research, the researcher only studied the samples of elderly people who lived in Bangkok and its perimeters; So, if it is possible, there should be an additional study into other areas for comparison. Moreover, in this research, the study was only conducted on a website that displayed the result on a PC computer and notebook, it did not include the display via smartphones or tablets.

## IX. SUGGESTION FOR FURTHER RESEARCHES

In the future, the researcher would like to study and create a new research work on information technology focusing on the elderly more since according to the result of the experiment, it was found that the elderly were interested in new information technology and wanted to learn and use it if designed appropriately. Therefore, there should be a further study and development of physically, economically, and socially appropriate technology for the people of this age.

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