IJCSI International Journal of Computer Science Issues, Vol. 9, Issue 5, No 1, September 2012
ISSN (Online): 1694-0814
www.IJCSI.org

10

# A Study on Preference of Interface Design Techniques for Web Survey

Wisitmon Srinilta[1], Pongpun Anuntavoranich[2], Settapong Malisuwan[3], and Suppawan Taraphokakul[4]

[1] Technopreneurship and Innovation Management Program, Graduate School, Chulalongkorn University
Bangkok, 10330, Thailand

[2] Faculty of Architecture, Chulalongkorn University
Bangkok, 10330, Thailand

[3] Office of The National Broadcasting and Telecommunications Commission
Bangkok, 10400, Thailand

[4] Faculty of Commerce and Management, Mahidol University
Kanchanaburi, 71150, Thailand

## Abstract

According to the advancement in internet and web-based application, the survey via the internet has been increasingly utilized due to its convenience and time saving. This article studied the influence of five web-design techniques - screen design, response format, logo type, progress indicator, and image display on the interest of the respondents. Two screen display designs from each design technique were made for selection. Focus group discussion technique was conducted on the four groups of Y generation participants with different characteristics. Open discussion was performed to identify additional design factors that will affect the interest of the questionnaire. The study found the degree of influence of all related design factors can be ranked from screen design, response format, font type, logo type, background color, progress indicator, and image display respectively.

*Keywords: Image Display, Logo Type, Progress Indicator, Response Format, Screen Design, Web-Survey Design*

## 1. Introduction

Due to the advancement in internet and web-based application, the survey via the internet has been increasingly utilized. The reason is that internet survey could access to respondents with no limitation anyplace and time [1], [2]. It could explore the truth better with less cost and time and access to citizens living in a far area with more ease. Its design is multifarious and the answers could be filled out with more completion [3]-[7]. Data collection via web survey could be designed with variety, for example, with the use of colors, graphics, sounds and videos. The program itself could collect and compile data automatically [8]. This data collection method is then effective and highly efficient.

However, the response rate of web survey has lower response rate compared to that of mail or paper survey [9]. Widely conducted research studies have been come to place to solve such problem. One of the popular strategies aimed to increase the response rate of web survey is the questionnaire design. The questionnaire design is aimed to enhance interest and convenience for respondents in answering the survey [10]-[12].

From relevant research studies, it is found that different design techniques in web survey have been studied and applied with more varieties to the questionnaire. It is also found that there is an impact of the design techniques on the response rate. Therefore, the objective of this study is to:

1) Investigate related studies in order to categorize and analyze the impact of key web survey techniques.
2) To collect the data from group discussion about the design techniques of web survey.
3) To study the design techniques for web survey those enhance the interest and convenience for respondents in answering the survey.

## 2. Literature Review: Web Survey Design

In the process of web survey, the results in survey response can be divided into four characteristics [1].

IJCSI International Journal of Computer Science Issues, Vol. 9, Issue 5, No 1, September 2012
ISSN (Online): 1694-0814
www.IJCSI.org

11

- Unit nonresponse: Respondents do not answer even the single question.
- Breakoff: Respondents stop answering the survey halfway prior to the last question.
- Item nonresponse: Respondents read the questions until the last one, but do not answer all questions.
- Complete response: Respondents answer all questions.

From related research studies, the design techniques could be divided into five categories. This can be summarized as below:

## A. Screen Design

Screen design is the design of survey screen characteristics. It can be divided into two types:

- Single page means single-page screen design. All questions will be in the single page. Its perspective will be similar to paper survey. The respondents have to move the scroll bar to answer every question till the last question.
- Multiple pages mean one-question per one-page screen design. If the respondents want to answer the next question, they have to answer the question on that page prior to skipping to the next question, press the icon for skipping to the next questions until they finish the questionnaire.

Couper, Traugott and Lamias [13] found that the multi-page could collect data faster than the single-page. However, Manfreda, Batagelj and Vehover [14] found that the multi-page took 30 percent more time than the single-page in collecting the data. Besides, comparing to the multi-page, the single-page could increase the response rate as well as decrease the number of respondents discarding to do the questionnaire [15], [16].

## B. Progress Indicator

Progress indicator means the status indicator in questionnaire. It can be grouped into two categories:

- Not include progress indicator means the design of screen with no status indication while the respondents are doing the questionnaire. The respondents will fill out the questionnaire until the final question without knowing the status of how complete or which percentage they are doing the questionnaire.
- Include progress indicator means the design of screen with status indication while the respondents are doing the questionnaire. There are several types of status indicators such as font

displaying percentage of completion and square box displaying percentage of completion.

For the disadvantages, it would take longer time for the people to make a response and also negatively result on the design of interactive web survey. In addition to this, the high response rate happened with the survey containing no status indication [13], [17], [18]. However, for the advantage, by including the progress indicator, it helped decreasing the number of respondents stop answering the survey halfway prior to the last question [19].

## C. Image Display

Image display means the design of screen with additional details on pictures to clarify questions or explain the meaning of questions. Image display can be categorized into two formats:

- Not include image display means simple screen design. Its background is white with black fonts. Its characteristic will be similar to paper survey without any pictures in the questions.
- Include image display means striking screen design with additional details on pictures and question clarification. It also comes with more attractive features to capture the respondents' interest.

It was found that the response from attractive questionnaire design with image display was less than the response from the normal one [20]. On the contrary, Daley, McDermontt, McCormac, Brown, and Kittleson [15] found that the response rate would increase if the image display was included. Moreover, the image display also helped lessen the rate of respondents stop answering the survey halfway prior to the last question [10], improved the quality of response, and also made the survey containing a long topic question to be more appealing [21].

## D. Response Format

Response format means the design of screen for answers. There are two types of response formats:

- Radio button means the circle sign with space inside. The way to answer is to make a cross or signal in that space by choosing only one answer. The design will be similar to check box of paper survey.
- Drop down box means the screen design for the answer to be in square shape with hidden explanation. The way to answer is to click the answer in that box.

From the study, it was found that there is no different in response format between drop down box which the design for the answer to be in square shape with hidden explanation and radio button which the design will be similar to check box of paper survey [10].

However, Heerwegh and Loosveldt [22] found that drop down box demanded more time to answer the question whereas radio button resulted in higher and faster response rate [23]. In Healey's study [24], on the other hand, it was found that the radio button encountered higher the rate of respondents stop answering the survey halfway prior to the last question while the drop down box obtained the rate of respondents read the questions until the last one, but do not answer all questions higher than the radio button.

### E. Logo Type

Logo type means the influencing factor of the researcher's logo usage on the respondents' interest and confidence. There are two types of logo types:

- Not include logo type means the questionnaire without any researcher's logo on the survey screen.
- Include logo type means the questionnaire with the researcher's logo on the survey screen.

By presenting the logo or icon of the researcher on a survey page, it stopped the respondent halfway of doing the questionnaire [25]. In spite of this, to present the logo reduced the rate of respondents read the questions until the last one, but do not answer all questions more than to make it disappear [14]. In sum, to conduct an online survey, it would be appropriate to present the logo of the researcher on a survey page since this will help the respondent to learn more about the data collector [26].

The results of the literature review will be used as a framework to research web survey techniques to develop the efficient web survey questionnaire. And this web survey technique study will focus on the Generation Y sample. That is, the Generation Y is the significant sample for various companies and organizations since it has large market size and generates a large amount of revenues [13], [27].

## 3. Research Methods

### 3.1 Methodology

This study rendered the qualitative research methodology by using the focus group discussion technique which regarded as one of the effective method for study of behaviour and decision making of human. For instance, when we are interested in probing or searching the reason

why people think about things or choose among alternatives, qualitative research is quite effective for the study.

During focus group discussion, two screen display design from each design technique were shown to the participants. Each participant selected the most interesting screen display from each design technique and noted their answer with reason to choose on the answer sheet. Then the open discussion was made to allow the participants to express their opinions and reasons to choose. This open discussion helped the researcher to get the in-depth information concerning the specific reason to choose of each participant.

In order to find additional design techniques that affect the interest of questionnaire, all participants were asked to suggest their opinions during open discussion. All additional design techniques then were combined with the five design techniques and listed on the board. All participants were asked to rank the design technique in accordance with its important and write the answer on the answer sheet.

In analyzing the result, the score was assigned to each rank as followings;

Rank 1 = 1
Rank 2 = 2
Rank 3 = 3
Rank 4 = 4
Rank 5 = 5
Rank 6 = 6
Rank 7 = 7

Then score of each design technique was combined and ranked by the least value accordingly.

### 3.2 Sample

Samples consisted of four groups with six participants on each group. Fundamental qualifications of participant are as followings:

1. Usually use internet.
2. Never known the moderator.
3. Never known any participant in the group.
4. Not join the focus group discussion with in the last 6 months

For each group of discussion, there are specific qualifications as followings:

Group 1:
1. Age between 24-34 years
2. With knowledge in web design or experience in web design as web designer
3. With or without experience on web survey

Group 2:
1.  Age between 22-27 years
2.  With experience on web survey (user)

Group 3:
3.  Age between 22-27 years
4.  Without experience on web survey (nonuser)

Group 4:
5.  Age between 28-34 years
6.  With experience on web survey (user)

## 4. Research Tools

There were five design techniques - screen design, progress indicator, image display, response format, and logo type to be studied. Two screen display designs were made for each design technique. Thai Language was utilized on screen display for convenience and effective communication for participants. Each screen display design was printed out on A3-sized paper with characters showing the difference of each picture. Two screen display designs from each design were shown to the participant simultaneously by group facilitator. The participants selected the higher attractive screen display and note their reason to choose on the answer sheet.

### 4.1 Screen Design

Picture 1 shows the single-page type questionnaire design that consists of all questions in one page. Picture 2 shows the multi-page type questionnaire design that has only one question for each page. The respondent is required to click the "continue" button for the next question.
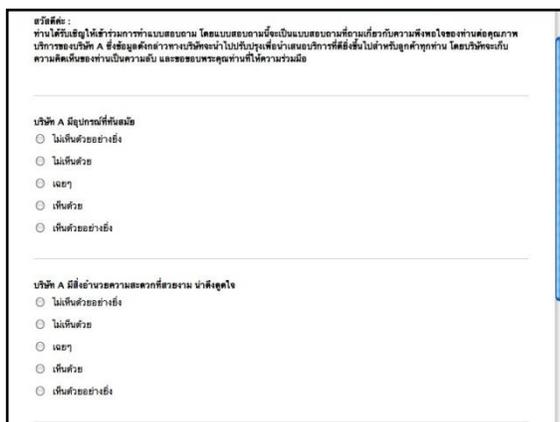


Figure 1 Single-page design
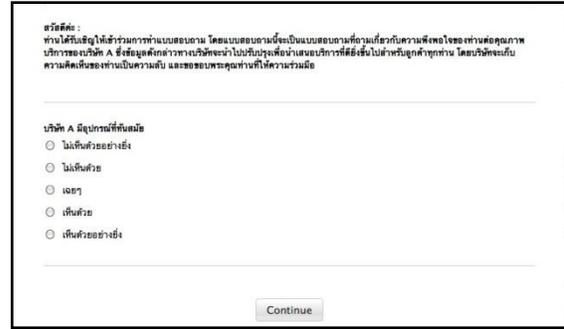


Figure 2 Multi-page design

### 4.2 Progress Indicator

Picture 3 shows the multi-page type questionnaire design without progress indicator on the top of the picture. Picture 4 shows the multi-page type questionnaire design with progress indicator on the top of the picture.
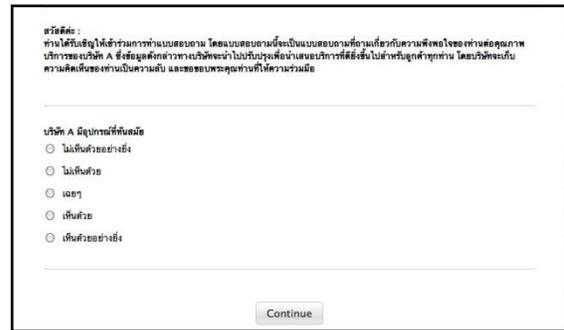


Figure 3 Without progress indicator design



Figure 4  With progress indicator design

### 4.3 Image Display

Picture 5 shows the multi-page type questionnaire design without image display while picture 6 shows the

IJCSI International Journal of Computer Science Issues, Vol. 9, Issue 5, No 1, September 2012
ISSN (Online): 1694-0814
www.IJCSI.org

14

multi-page type questionnaire design with image display.



Figure 5 Without image display design



Figure 6 With image display design

### 4.4 Response Format

Picture 7 shows the multi-page type questionnaire design with the radio type response format. Picture 8 shows the multi-page type questionnaire design with drop-down box response format.



Figure 7 Radio Button response format design



Figure 8 Drop down box response format design

### 4.5 Logo Type

Picture 9 shows the multi-page type questionnaire design without the logo type display. Picture 10 shows the multi-page type questionnaire design with logo type display to inform the participant regarding the owner of the web survey.



Figure 9 Without logo type design



Figure 10 With logo type design

## 5. Results

### 5.1 Results from Five Design Techniques

Results from the focus group discussion study in selecting the web design from each design technique can be summarized as following:

## A. Screen Design

Table 1 Opinion of screen design technique

| Group | Design Techniques | |
|---|---|---|
| | Single Page | Multi Page |
| 1 | 3(50%) | 3(50%) |
| 2 | 2 (33%) | 4(67%) |
| 3 | 5(83%) | 1(17%) |
| 4 | 3(50%) | 3950%) |
| Total | 13 (54%) | 11 (46%) |

Form Table 1, the study found that in summary, there is no any significant difference on single-page design and multi-page design of questionnaire. The selection of single-page design was from 13 participants or 54% while and multi-page design was from 11 participants or 46%.

From open discussion, the study found that the main reasons for selecting of single-page design are convenience to answer, can see all questions simultaneously and well for the problem of slow internet.

## B. Progress Indicator

Table 2 Opinion of progress indicator technique

| Group | Design Techniques | |
|---|---|---|
| | Without Progress Indicator | With Progress Indicator |
| 1 | 1(17%) | 5(83%) |
| 2 | 3(50%) | 3(50%) |
| 3 | 1(17%) | 5(83%) |
| 4 | 2(33%) | 4(67%) |
| Total | 7 (29%) | 17 (71%) |

Table 2 shows that in summary, there is a significant difference on progressive indicator design of questionnaire. The selection of questionnaire design with progressive indicator was from 17 participants or 71% while design without progressive indicator was from 7 participants or 29%.

From open discussion, the study found that the main reasons for selecting of questionnaire design with progressive indicator are that the respondent can estimate the time required to complete the questionnaire and the respondent can check the completion.

## C. Image Display

Table 3 Opinion of image display technique

| Group | Design Techniques | |
|---|---|---|
| | Without Image Display | With Image Display |
| 1 | 5(83%) | 1(17%) |
| 2 | 3(50%) | 3(50%) |
| 3 | 0(0%) | 6(100%) |
| 4 | 0(0%) | 69100%) |
| Total | 8 (33%) | 16 (67%) |

Table 3 shows that in summary, there is a significant difference on design of questionnaire with image display and design without image display. The selection of questionnaire design with image display was from 16 participants or 67% while design without image display was from 8 participants or 33%.

From open discussion, the study found that the main reasons for selecting of questionnaire design with image display are that image display helped frame the concept of the question for the respondent, helped the respondent to answer the question accordingly, and save the time to complete the questionnaire from time wasting on reviewing the prior questions.

## D. Response Format

Table 4 Opinion of response format technique

| Group | Design Techniques | |
|---|---|---|
| | Radio Button | Drop Down Box |
| 1 | 6(100%) | 0(0%) |
| 2 | 5(83%) | 1(17%) |
| 3 | 4(67%) | 2(33%) |
| 4 | 6(100%) | 0(0%) |
| Total | 21 (87%) | 3 (13%) |

Table 4 shows that in summary, there is a significant difference for design of questionnaire using radio button type and using drop down box. The selection of questionnaire design with radio button type was from 21 participants or 87% while design without drop down box was from 3 participants or 13%.

From open discussion, the participants selected who questionnaire design with radio button type gave the main reasons for selecting are easy to choose, convenience, able to see all questions simultaneously and save the time to complete the questionnaire.

## E. Logo Type

Table 5 Opinion of logo type technique

| Group | Design Techniques | |
|---|---|---|
| | Without Logo | With Logo |
| 1 | 0(0%) | 6(100%) |
| 2 | 0(0%) | 6(100%) |
| 3 | 0(0%) | 6(100%) |
| 4 | 0(0%) | 6(100%) |
| Total | 0 (0%) | 24 (100%) |

Table 5 shows that in summary, there is a significant difference for design of questionnaire using with logo and without logo of the questionnaire owner. The selection of questionnaire design with logo was from all 24 participants or 100%.

From open discussion, the participants who selected questionnaire design with logo type gave the main reasons for selecting are trust and confidence on owner reputation and reminding the respondent of question pertaining to the product and services of the company.

5.2 Additional Design Techniques

The participations were asked by the researcher for any additional techniques those could help improving the attractiveness of the questionnaire. Suggestions from all groups were the colour background of the website questionnaire and the font used in design improve the attractiveness of the questionnaire.

Specifically, 50%, 33% and 17% of participants with knowledge and experience on the web design suggested the use of Tahoma, Arial sized 12-13 and Ms San Serif font type respectively.

For the study on the level of important of each technique from open discussion, the study found that the influence of design techniques can be ranked from the highest important on screen design to the least important on image display. Rank of design techniques by its important was summarized in table 6 below.

Table 6 Rank of Design Techniques

| Design Techniques | G1 | G2 | G3 | G4 | Total |
|---|---|---|---|---|---|
| 1. Screen Design | 7 | 8 | 6 | 12 | 33 |
| 2. Response Format | 18 | 17 | 25 | 19 | 79 |
| 3. Logo Type | 20 | 32 | 25 | 15 | 92 |
| 4. Font | 28 | 15 | 25 | 31 | 99 |
| 5. Background Color | 26 | 21 | 27 | 39 | 113 |
| 6. Progress Indicator | 31 | 40 | 31 | 23 | 125 |
| 7. Image Display | 38 | 36 | 29 | 30 | 133 |

## 4. Conclusions

The objective of this research is to study the web design factors that influence the interesting of the Y-generation respondents. This study utilized the qualitative methodology by using focus group discussion method to gather related data. Five design techniques – screen design, response format, logo type, progress indicator, and image display were studied. Two screen displays wee designed from each technique for participants to select. Samples were selected into 4 groups. Each group possesses different characteristics. This study found that there was a higher preference from participants on progress indicator, logo type, response format and image display. However, there was no significant difference of participants' preference on screen design.

From open discussion, this study found additional suggestions from participants that the screen background color and font type may increase the interest of the questionnaire. Finally, this study found that the degree of important of all related design factors can be ranked from screen design, response format, font type, logo type, background color, progress indicator, and image display respectively.

## Acknowledgments

## References

[1] A. Ranchhod, and F. Zhou, "Comparing respondents of e-mail and mail surveys: understanding the implications of technology", Marketing Intelligence & Planning, vol. 19, 2001, pp. 254-262.

[2] C. C. Lin, H. J. Yang, and L. H. Kuo, "Behaviour analysis of internet survey completion using decision trees: an exploratory study", Online Information Review, vol. 33, 2009, pp. 117-134.

[3] S. Kiesler, and L. S. Sproull, "Response effects in the electronic survey", Public Opinion Quarterly, vol. 50, 1986, pp. 402-413.

[4] L. Paker, "Collecting data the e-mail way", Training & Development, 1992, pp. 52-54.

[5] C. Cobanoglu, B. Warde, and P. J. Moreo, "A comparison of mail, fax and web-based survey methods", International Journal of Market Research, vol. 43, 2001, pp. 441-452.

[6] J. B. Wiley, V. Han, G. Albaum, and P. Thirkell, "Selecting techniques for use in an internet survey", Asia Pacific Journal of Marketing and Logistics, vol. 21, 2009, pp. 455-474.

[7] J. Ben-Ur, and B. I. Newman, "A Marketing poll: an innovative approach to prediction, explanation and strategy", European Journal of Marketing, vol. 44, 2010, pp. 515-538.

[8] B. Gunter, D. Nicholas, P. Huntington, and P. Williams, "Online versus offline research: Implications for evaluating digital media", Aslib Proceedings, vol. 54, 2002, pp. 229-239.

[9] T. H. Shih, and X. Fan, "Comparing response rates from web and mail surveys: a meta-analysis", Field Methods, vol. 20, 2008, pp. 249–271.

[10] M. P. Couper, R. Tourangeau, F. G. Conrad, and S. D. Crawford, "What they see is what we get: response options for web surveys", Social Science Computer Review, vol. 22, 2004, pp. 111-127.

[11] J. C. Witte, R. P. Pargas, C. Mobley, and J. Hawdon, "Instrument effects of images in web surveys: a research note", Social Science Computer Review, vol. 22, 2004, pp. 363-369.

[12] A. Peytchev, "Survey breakoff", Public Opinion Quarterly, vol. 73, 2009, pp. 74-97.

[13] M. P. Couper, M. W. Traugott, and M. J. Lamias, "Web suevey design and administration", Public Opinion Quarterly, vol. 65, 2001, pp. 230-253.

[14] K. L. Manfreda, Z. Batagelj, and V. Vehovar, "Design of web survey questionnaires: three basic experiments", Journal of Computer-Mediated Communication, vol. 7, 2002.

[15] E. M. Daley, R. J. McDermott, K. R. McCormack Brown, and M. J. Kittleson, "Conducting web-based survey research: a lesson in internet designs", American Journal Health Behavior, vol. 27, 2003, pp. 116-124.

[16] A. Peytchev, M. P. Couper, S. E. McCabe, and S. D. Crawford, "Web survey design: paging versus scrolling", Public Opinion Quarterly, vol. 70, 2006, pp. 596-607.

[17] S. D. Crawford, M. P. Couper, and M. J. Lamias, "Web surveys: perceptions of burden", Social Science Computer Review, vol. 19, 2001, pp. 146-162.

[18] U. Matzat, C. Snijders, and W. vander Horst, "Effects of different types of progress indicators on drop-out rates in web surveys", Social Psychology, vol. 40, 2009, pp. 43-52.

[19] T. Yan, F. G. Conrad, R. Tourangeau, and M. P. Couper, "Should I stay or should I go: the effects of progress feedback, promised task duration, and length of questionnaire on completing web surveys", International Journal of Public Opinion Research, vol. 23, 2010, pp. 131-147.

[20] D. A. Dillman, R. D. Tortora, J. Conradt, and D. Bowker, "Influence of plain vs. fancy design on response rates for web", presented at Joint Statistical Meetings, Dallas, Texas, August, 1998.

[21] E. Deutskens, K. D. Ruyter, M. Wetzels, and P. Oosterveld, "Response rate and response quality of internet-based surveys: an experimental study", Marketing Letters, vol. 15, 2004, pp. 21–36.

[22] D. Heerwegh, and G. Loosveldt, "An evaluation of the effect of response formats on data quality in web surveys" Social Science Computer Review, vol. 20, 2002, pp. 471-484.

[23] M. P. Couper, R. Tourangeau, F. G. Conrad, and E. Singer, "Evaluating the effectiveness of visual analog scales: a web experiment", Social Science Computer Review, vol. 24, 2006, pp. 227-245.

[24] B. Healey, "Drop downs and scroll mice: the effect of response option format and input mechanism employed on data quality in web surveys", Social Science Computer Review, vol. 25, 2007, pp. 111-128.

[25] V. Vehovar, K. L. Manfreda, and Z. Batagelj, "Design issues in web surveys", in Proc. of the Survey Research Method Section, American Statistical Association, 2000, pp. 983-988.

[26] H. Backstrom and B. Henningson, "Testing web surveys", in the 4th Conference on Questionnaire Evaluation Standards, Mannheim, 2003, pp. 152-160.

[27] R. Ladhari, "Service quality, emotional satisfaction, and behavioural intentions: A study in the hotel industry", Managing Service Quality, vol. 19, 2009, pp. 308-331.