

**Integrating Social Networking Sites into e-Commerce Website:
A Study on Online Consumer Behaviour**

By
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Dissertation submitted in partial fulfilment of
the requirements for the
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CERTIFICATION OF APPROVAL

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May 2012

CERTIFICATION OF ORIGINALITY

This is to certify that I am accountable for the work submitted in this project, that the original work is my own except as specified in the references and acknowledgement, and that the original work herein has not been undertaken or done by unspecified sources or persons.

(STEPHANIE CRISTAL DAUD)

ABSTRACT

The high interactivity rate in social networking sites (SNSs) has drawn the attention of many researchers and businesses. However, this has at the same time made it difficult for businesses to decide where to build their web presence - in their e-commerce website or in SNSs. Therefore, this project, embracing the methodology of rapid application development (RAD), aims to study the impact on the online consumers' behaviour, particularly in their perceived trust, word-of-mouth (WOM) effect among them, and their purchase intention in the e-commerce website, by integrating *Facebook* social elements into the website interface of an e-commerce website, *ToHerHeart.com*. A research online survey was developed and distributed before and after this integration. The research outcome shows that the positive impact of this social integration was generally not significant to accept the project hypotheses; integrating *Facebook* social elements into *ToHerHeart.com* e-commerce website interface does not really increase the online consumers' perceived trust, WOM effect among them, and their purchase intention in *ToHerHeart.com*. The research outcome also suggests that businesses build their e-commerce website and at the same time set up their business webpage in SNSs to optimize the business advantages of both and minimize the overall disadvantages. Recommendations for future research were also outlined in this paper.

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Yours truly,
Stephanie Cristal Daud.

TABLE OF CONTENT

CERTIFICATION OF APPROVAL.		i
CERTIFICATION OF ORIGINALITY		ii
ABSTRACT		iii
ACKNOWLEDGMENT		iv
CHAPTER 1:	INTRODUCTION	1
	1.1 Background of Study	1
	1.2 Problem Statement	2
	1.3 Objectives and Scope of Study	4
CHAPTER 2:	LITERATURE REVIEW	7
	2.1 Perceived Trust	7
	2.2 Word-of-mouth (WOM) Effect	8
	2.3 Purchase Intention	9
	2.4 Critical Analysis of Literature	10
	2.5 Research Model	11
CHAPTER 3:	METHODOLOGY	12
	3.1 Rapid Application Development Methodology	12
	3.2 Tools Required	19
	3.3 Project Gantt Chart and Key Milestones	20
CHAPTER 4:	RESULT AND DISCUSSION	21
	4.1 User-based Web Usability Lab Test Observations	21
	4.2 <i>ToHerHeart.com</i> Business Strategies Enhancement	24
	4.3 <i>ToHerHeart.com</i> Website Enhancement	24
	4.4 User-based Web Functionality Test Observations	31
	4.5 Survey Mean Score Simple Comparison Result	31
	4.6 Survey Data t-Test Result	32
	4.7 Discussion on the Result Obtained	35
CHAPTER 5:	CONCLUSION AND RECOMMENDATIONS	37
	5.1 Conclusion	37
	5.2 Recommendations	38
REFERENCES		42
APPENDIX:	TECHNICAL PAPER	44

LIST OF FIGURES

Figure 2.1	Research model and project hypotheses mapping	11
Figure 3.1	Rapid application development project methodology	12
Figure 3.2	Gantt chart of the entire project	20
Figure 4.1	Summary of user-based lab test observations and actions taken	23
Figure 4.2	Former <i>ToHerHeart.com</i> website home page screenshot	25
Figure 4.3	Enhanced <i>ToHerHeart.com</i> website home page screenshot	26
Figure 4.4	Finalized <i>ToHerHeart.com</i> website home page screenshot	26
Figure 4.5	<i>ToHerHeart.com</i> gift page screenshot with new e-commerce tools	27
Figure 4.6	Menu links to the newly added web services	28
Figure 4.7	<i>Ecwid</i> customer database system back office	29
Figure 4.8	<i>Prestashop</i> customer management system back office	29
Figure 4.9	<i>Ecwid</i> product catalogue management system back office	30
Figure 4.10	<i>Prestashop</i> product catalogue management system back office	30
Figure 4.11	Mean score comparison result from both surveys	31
Figure 4.12	Screenshot of H1 online t-Test calculator result	32
Figure 4.13	Screenshot of H2 online t-Test calculator result	33
Figure 4.14	Screenshot of H3 online t-Test calculator result	34

ABBREVIATIONS

H1	Hypothesis 1
H2	Hypothesis 2
H3	Hypothesis 3
RAD	Rapid application development
SNSs	Social Networking Sites
WOM	Word-of-mouth

LIST OF WEBSITES

Arvixe	www.arvixe.com
Ecwid	www.ecwid.com
Facebook	www.facebook.com
Google Docs	docs.google.com
Google Plus	plus.google.com
GraphPad Software	www.graphpad.com
LinkedIn	www.linkedin.com
Prestashop	www.prestashop.com
ToHerHeart.com	toherheart.com
Yola	www.yola.com
9GAG	9gag.com

CHAPTER 1

INTRODUCTION

1.1 Background of Study

The Social Presence Theory - the presence of interaction opportunity between real people - introduced by Short, Williams, & Christie [22] has been one of the popular research areas for many years, even in the field of business. More people are driven to spend more time over the Internet in this current technology era [3]. In fact, the active participation in social networking sites (SNSs) today has already fused into the general society as part of the culture [20]. This acculturation is one of the major factors that contribute to the growing research interest in the study of social presence over the Internet.

Social presence has always been very essential to e-commerce websites due to the cold and impersonal nature of the virtual environment in the online world [1,5,8,16]. Besides, people are made to be relational beings who naturally desire interaction with one another. When these two natures are related to online consumer behaviour, real human interaction and human warmth in the e-commerce website environment become crucial in order to engage the online visitors better, and to eventually convert them into consumers.

As businesses gradually realize the importance of social presence in the online business environment, many have started to integrate social presence elements into their e-commerce websites interface. For example, most of the e-commerce websites provide photos of the products they are selling in addition to short text product descriptions in order to better interact - although electronically - with the online consumers about the products they are trying to sell. Some businesses advance further to include forum and

live chat into their websites. The powerful combination of these social presence elements is what makes SNSs, like *Facebook* (www.facebook.com), so successfully populated [24].

Many businesses have also been drawn to participate in SNSs, due to the high daily activity rate in SNSs like *Facebook* [24], by setting up their social business webpage where their online consumers can receive timely feeds of their latest products or promotional information via the interactive platform provided by SNSs. These SNSs do not just help businesses disseminate marketing information more easily and effectively, they also make it possible for the online consumers to spread the marketing information to family and friends within their own social networking groups easily and conveniently with just few clicks - a powerful viral marketing advantage at no cost for the businesses.

1.2 Problem Statement

Due to the great business benefits associated with the SNSs which have been proven capable of increasing online sales for businesses, some especially the small-business start-ups mistakenly assume that it is sufficient to set up a social business webpage in SNSs as their only web presence - the presence of the business in the Internet, that they do not need to build their own e-commerce websites. A few examples of such businesses are *Xuan's Bakery*, *Question Mark Enterprise.co* and *Q-Love FashiOn Street* which are all 'online shops' set up in *Facebook* without their own websites. Building web presence in SNSs alone may seem to be sufficient for small businesses that do not envision growing bigger in the future, but it will raise several critical ownership-related issues for businesses that value long-term growth and online consumer engagement.

1.2.1 Loss of Business Data Ownership

Firstly, it is well understood that most data available in an SNS business webpage is stored and owned by that SNS. Surely it provides quite extensive information of the online consumers engaged to the SNS business webpage of a business, and some SNSs

such as *Facebook* even provide downloadable insights on the social interaction within the social business webpage which they host, but the business owner does not get to truly obtain the entire business data including its online consumers' profiles, and to integrate these data with the other components in its customer management system, like how he can by collecting and managing these data with a separate registration form, best done in his own e-commerce website. Moreover, consider the unknown risk of having the SNS to shut down and end its social networking service, all business data will then be lost altogether. Also, the privacy of users' data raises a greater concern when businesses rely on an external party such as SNSs to store their business data and customers details, as compared to having their own data management system and databases which are not sharing the same data storage in SNSs together with everyone else's data [14,19,23].

1.2.2 Lack of Control over System Reliability

Secondly, the system reliability of SNSs is beyond the control of the businesses. For instance, when the SNSs server is down, businesses may be faced with the risk of losing their critical sales online if their only web presence or 'online shop' is their social business webpage in SNSs. In case the SNSs decide to close down someday, it also means the 'online shop' of the businesses has to be closed down altogether. Worse cases like having other business rivals to hijack or buy over a social business webpage name directly from the SNSs without the initial owner's consent is even more frustrating, having all the engaged online consumers to be bought over altogether. This was the lost faced by a German drug maker, *Merck KGaA*, when *Facebook* admitted to have mistakenly made an administrative error and transferred the ownership of its *Facebook* business page to its rival, *Merck & Co* [18].

1.2.3 Highly Possible Weakening of Brand Reputation

Other than that, a business that builds its web presence only in SNSs raises another concern of brand reputation and trustworthiness to online shoppers. It is tempting to

think that a business that cannot afford or is not willing to invest for its own e-commerce website is not serious about doing real business, and thus it cannot be easily trusted. While on the other hand, when a business, which already has its own e-commerce website as its main web presence, sets up a social business webpage in SNSs as its additional web presence, such a trustworthy concern will not be significant.

Therefore, the problem here is: Businesses that build their web presence solely in SNSs can capitalize on the business benefits associated with SNSs, but at the cost of losing their business data ownership, lacking control over the system reliability of SNSs to keep their 'online shop' up running well all the time, as well as possibly weakening their brand reputation for not having their own websites. This project aims to provide an additional valuable guideline to new businesses which desire to go online in deciding whether to save the cost and take the business risk by building their web presence solely in SNSs business webpage, or to invest in building their own e-commerce website.

It is important to note that when a business has its own e-commerce website, all the major ownership-related issues due to not having its own website and only setting up a social business webpage in SNSs as mentioned earlier are no longer a concern, because now the business holds the ownership of its business data and website reliability, and builds a stronger brand reputation for itself by having its own e-commerce website.

1.3 Objectives and Scope of Study

The objectives of this project are to (1) transform the website of an existing young online gift shop into a more professional e-commerce website through continuous website development complemented with user-based web usability test, to (2) integrate several social elements from a successful SNS into the website interface to capitalize on the proven business benefits that are associated with SNSs, and to (3) analyze the impact of integrating these social elements from SNSs into e-commerce website interface.

ToHerHeart.com (pronounced as To Her Heart dot Com, toherheart.com), a young online gift shop first founded and launched in September 2011, has been selected to accomplish the first objective of this project to transform it into a more professional e-commerce website. With *Facebook* being one of the most popular SNSs currently, its social presence elements such as the *Facebook Like Button* and *Comment Box* have been selected to be integrated into *ToHerHeart.com* website interface.

1.3.1 Transforming *ToHerHeart.com* - an Existing Young Online Gift Shop

ToHerHeart.com was founded to support young people in pursuing meaningful life relationships with all the important ladies in their lives - their mother, sister, girlfriend, and girl friends. Before this project took place, *ToHerHeart.com* website was built on a free website builder platform, *Yola* (www.yola.com) embedded with a free online catalogue software separately hosted by *Ecwid* (www.ecwid.com). Only the domain name was formerly purchased to enhance the website credibility. All these provided this project a good opportunity to further enhance the former *ToHerHeart.com* website into a more professional e-commerce website. Thus, under this project, the former *ToHerHeart.com* website will be transformed through continuous web development effort, complemented with feedback and observations collected from user-based web usability test.

1.3.2 Integrating Social Elements into *ToHerHeart.com* Website Interface

After *ToHerHeart.com* e-commerce website is being finalized, the selected social elements from *Facebook*, such as the *Facebook Like Button* and *Comment Box*, will be integrated into *ToHerHeart.com* website interface in order to enhance the interaction opportunity of the website contents among the website users.

1.3.3 Analyzing the Impact of Integrating *Facebook* Social Elements

As mentioned in the earlier section, the major ownership-related issues of building business web presence in SNSs business page solely can be avoided by setting up own business website. However, there is a need to justify if businesses can still capitalize on the business benefits, which are strongly associated with SNSs within the SNSs platform, after integrating the social elements from SNSs into business website interface. Thus, this project includes measuring and analyzing the social impact of integrating social elements from *Facebook* into *ToHerHeart.com* website interface.

CHAPTER 2

LITERATURE REVIEW

2.1 Perceived Trust

In the year 2003, Riegelsberger, Sasse, & McCarthy conducted a study on whether the positive effect of increased trust by adding photos in advertisements would also result the same when applied in e-commerce website interface [21]. The study shows that carefully selected photos that are relevant to the web contents do help increase online consumers' trust for the e-commerce website generally, yet also depending on the nature of the websites [21]. What this means is that, although trust may be increased by adding relevant photos, this resulted trust is not always necessary or beneficial to all websites. For instance, greater trust is not really necessary for entertainment websites like 9GAG (9gag.com) in order to pull more readers and jokes contributors; the purpose of adding photos into this website is only to enhance readers' amusements and enjoyments.

In addition, Harris & Goode [9], Mantymaki & Salo [16], McCole, Ramsey, & Williams [17], and Weisberg, Te'eni, & Arman [26] also conducted studies which all concluded the importance of online consumers' trust in e-commerce websites for driving online purchasing intention. Social presence can be infused into e-commerce websites through the creative usage of socially-rich words and photos to create human warmth, and thus, trust, in the online environment [10,16].

In the context of trust created through *Facebook* social elements, when a *Facebook* user "Likes" or "Comments" on a product or content posted in an e-commerce website, this piece of information will appear on this user's *Facebook Wall*. When the *Facebook* friends of this user see the liked or shared information on his *Facebook Wall*, it will indirectly tell them that he trusts this particular e-commerce website who owns the information that he likes or shares. If his

Facebook friends also “Like” or “Comment” on the business information he has “liked” or “commented” on, this will then indirectly tell how much his *Facebook* friends trust the contents he spread. The level of online consumers’ perceived trust, which is strengthened by this chained trust effect, will be measured and analyzed in this project before and after integrating *Facebook* social elements such as the *Facebook Like Button* and *Comment Box* into *ToHerHeart.com* website interface.

2.1.1 Analyzing the Online Consumers’ Perceived Trust

Therefore, the first hypothesis (H1) that this project will have to test states: Integrating the social elements from *Facebook* into an e-commerce website interface increases the online consumers’ perceived trust for the website and its contents.

2.2 Word-of-mouth (WOM) Effect

Later in April 2011, a study on the impact of SNSs to organizations and their employees shows that a significant majority - as high as 74% of the study participants - agreed that SNSs are capable to be their great ‘weapons’ to spread negative remarks about their organizations and harm the reputation of the organizations in case of employees’ dissatisfaction towards their organizations [2]. This result strengthens the strong influence that exists among the social networking communities through word-of-mouth (WOM). Nevertheless, it also leads to the need to justify if businesses can still preserve this viral WOM influence of the social networking communities that strongly exists within *Facebook* by integrating its social elements into e-commerce websites.

Several studies conducted earlier also presented the greater WOM opportunity and impact that SNSs can better provide for businesses compared to traditional marketing strategies [6,7,14,25]. SNSs, especially *Facebook*, have been proven to have the capability of helping businesses reach more customers through their respective built-in applications for businesses [6,7] at a way much lower cost via the setting up of social business webpage in SNSs.

This WOM effect works similarly like the chained trust effect: a *Facebook* user spreads about a product or information of an e-commerce website, and his *Facebook* friends who “Like” or “Comment” on his post about this shared business product or information will continue to spread about it, and their next level of friends will help spread the information even further. This viral marketing effect of spreading the business product or information will eventually continue down to multiple levels of other *Facebook* users. Thus, the level of this WOM effect among the online consumers in *ToHerHeart.com* will be another variable to be measured and analyzed in this project, before and after the *Facebook* integration.

2.2.1 Analyzing the WOM Effect among the Online Consumers

Hence, the second hypothesis (H2) to be tested under this project states: Integrating the social elements from *Facebook* into an e-commerce website interface increases the online consumers’ intention to share and spread about the posts, products, programs and promotional information from the website to their family and friends.

2.3 Purchase Intention

The study conducted by Jiang, Chan, Tan, & Chua [13] has concluded that active interaction, or social presence, in the e-commerce website promotes online consumers’ purchase intention, besides the other factors which also affect the purchase intention, including product price and consumers’ time availability for further product survey [15].

Facebook has a very high interactivity among its users even at the rate of every second [24]. However, there is also a need to justify if this high user interactivity rate in *Facebook* can still be preserved in the e-commerce website after integrating its social elements into the website interface, to eventually promote online consumers’ purchase intention in the website. Hence, this project *also measures and analyzes* the level of online consumers’ purchase intention that is encouraged by the interaction between web visitors within *ToHerHeart.com* website, before and after the integration of *Facebook* social elements into *ToHerHeart.com* website interface.

2.3.1 Analyzing the Online Consumers' Purchase Intention

Thus, this project will also test the third hypothesis (H3): Integrating the social elements from *Facebook* into an e-commerce website interface increases the online consumers' intention to purchase products from and use the services offered by the website.

2.4 Critical Analysis of Literature

Many social presence-related studies conducted earlier have laid down an established foundation for this project by conveying the respective limitation in their studies as well as the opportunity to expand their studies for future research.

2.4.1 Lack of Related Studies Done on Actual Websites

Among the literatures reviewed for this project, a common limitation is presented: the laboratory website setting of the studies hindered the collection of actual or natural consumers' behaviour data, which by far can only be collected via real websites [5,10,11]. On top of that, most studies were conducted across websites selling limited variations of products sold or services [9,10,13]. This has led to the setting of this project scope to be conducted in an actually operating e-commerce website, *ToHerHeart.com*, which sells all kinds of gifts - handicrafts, necklaces and earrings, books, electronic gadgets, apparels, and more - as well as services like fellowship advice and celebration planning.

2.4.2 Lack of Studies on Business Benefits of *Facebook* in other Websites

In addition, many studies have been conducted to analyze and prove the business benefits that are associated with *Facebook* within the *Facebook* context in particular, but none has really studied on the beneficial business impact of *Facebook* social elements if they were to be integrated into e-commerce website interface. This area that lacks research is the reason that leads small-business start-ups to assume that setting up their 'online shop' inside SNSs like *Facebook* is the best option - easiest and cheapest - if

they decide to go online, without realizing the cost of the ownership-related issues mentioned earlier.

2.4.3 New Social Elements yet to be Studied

As of current, researchers have studied on the impact of integrating social presence into e-commerce website interfaces via the usage of socially-rich text descriptions and photos for the products or services sold online, as well as the inclusion of online chatting system and forum [5,10,11]. So it opens doors for new research to study on the impact of integrating other different social elements into the e-commerce website interface. To capitalize on the high popularity of SNSs nowadays, their social elements present yet a new area of study: to integrate user-familiar SNSs social elements into e-commerce website interface, instead of integrating standalone product comment boxes or content-sharing function. To optimize the outcome of social presence for the e-commerce website, *Facebook* has been selected due to its popularity and population size among all other SNSs [24]. This is also to capitalize on the greater level of familiarity that many online users today already have with *Facebook* elements to encourage more interaction within the website that uses the same *Facebook* social elements such as its *Like Button* and *Comment Box*.

2.5 Research Model

To better visualize the entire project, Fig. 2.1 below illustrates its research model.

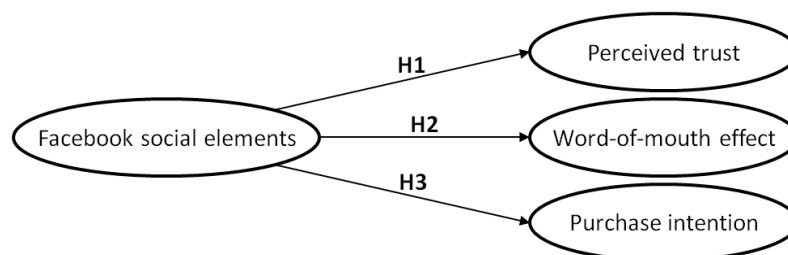


FIGURE 2.1. Research model and project hypotheses mapping.

CHAPTER 3

METHODOLOGY

3.1 Rapid Application Development Methodology

This project was broken down into two phases, and both embraced on the rapid application development (RAD) methodology as illustrated in Fig. 3.1 below.

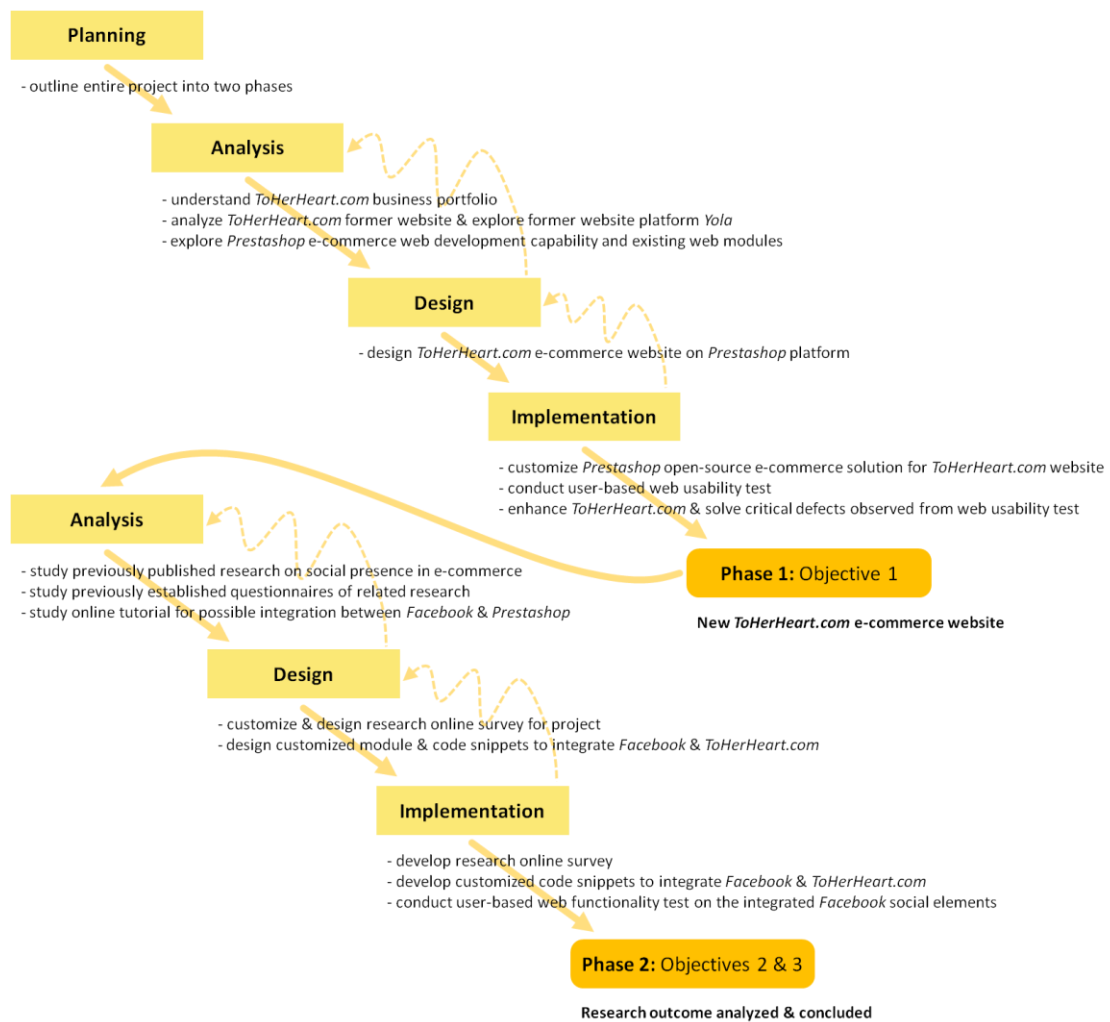


FIGURE 3.1. Rapid application development project methodology.

In the planning stage, the entire project was outlined in detail, including the finalization of the project title from several ideas brainstormed earlier. The project was broken down into two phases for better project organization and management, where phase 1 focused on transforming the former *ToHerHeart.com* website into a professional e-commerce website, while phase 2 focused on analyzing the impact of integrating the selected social elements from *Facebook* into the finalized *ToHerHeart.com* e-commerce website interface on online consumers' behaviour.

3.1.1 Phase 1 Analysis - *ToHerHeart.com* Business Portfolio and Website

The business portfolio of *ToHerHeart.com* was thoroughly studied and analyzed, from its mission and vision to its business model, and then compared against its former website to evaluate how effectively did the former website reflect the actual business portfolio of *ToHerHeart.com* online. The web features and web development capability of the former web builder, *Yola*, were researched on to evaluate if *Yola* would be the best platform for *ToHerHeart.com* e-commerce website. Additional business strategies that were relevant and beneficial to *ToHerHeart.com* were also identified to further enhance its web presence even from the business point of view.

The evaluation showed that *Yola* is more suitable for quick-and-easy business website setup as it specializes in providing ready website structure and template to get businesses running online and thus, is not very flexible for deep customization on the business owners' end. Of course, such customization is allowed at *Yola* only by subscribing a premium *Yola* account, which is not very cost effective to accomplish the first objective of this project: to transform the former *ToHerHeart.com* website into an e-commerce website.

Therefore, another online research was done to select the most cost optimized e-commerce software that is capable of providing the acceptably complete e-commerce platform needed to build the new *ToHerHeart.com* e-commerce website. *Prestashop* (www.prestashop.com), a free open-source e-commerce software solution, was

favourable due to its high flexibility to customize an e-commerce website as well as its relatively high recommendation by other website developers online. The various existing *Prestashop* e-commerce modules and its online development tutorials were then studied to better understand its web development structure and programming languages in order to realize the new *ToHerHeart.com* e-commerce website.

3.1.2 Phase 1 Design - the New *ToHerHeart.com* e-Commerce Website

As a result of the analysis done earlier, the new *ToHerHeart.com* e-commerce website was decided to be built on *Prestashop* open-source e-commerce software solution, and hosted in *Arvixe* (www.arvixe.com) the web host as of this writing. The domain name of *ToHerHeart.com* was also transferred from its former host *Yola* to *Arvixe*.

The new *ToHerHeart.com* e-commerce website was designed to consist of five main web services: (1) the daily encouragement short article, (2) the monthly featured fellowship idea, (3) the occasional meaningful program, (4) the online gift shop, and (5) the online relationship advice and consultation. A brand appearance theme was also designed for *ToHerHeart.com* to be adopted by its new e-commerce website.

3.1.3 Phase 1 Implementation - Developing the New *ToHerHeart.com*

Once the website designs were finalized, the development of *ToHerHeart.com* was commenced. Most of the default *Prestashop* e-commerce web modules were customized and tailored to the business needs of *ToHerHeart.com*, and several new web pages were also built.

The newly developed *ToHerHeart.com* e-commerce website was sent to MIMOS Berhad Test Lab for user-based web usability test. Seven users were randomly invited from among the targeted web visitors to participate in this user-based lab test on web usability at MIMOS Berhad Test Lab using the Tobii T60 Eye Tracker to professionally test the website usability. Nevertheless, one of the seven test users did not show up. The

six users who participated took turns to enter the test lab, guided by a moderator, to complete a list of five outlined test cases to professionally test-prove the major website functionalities. The entire test for all the six users was also observed from outside the test lab and the entire conversation between the users and the moderator was recorded. These collected observations and recorded audio files were used as inputs to further enhance *ToHerHeart.com* e-commerce website interface through continuous website development in order to make it more user-friendly and to address all the functional defects identified during the web usability test. The finalized *ToHerHeart.com* e-commerce website was launched, marking the accomplishment of project objective 1.

3.1.4 Phase 2 Analysis I - Surveys in Social Presence-related Papers

Several social presence-related papers, including those by Chen et al. [4], Cyr et al. [5], Hassanein & Head [10], Hassanein & Head [11], Mantymaki & Salo [16], and Riegelsberger et al. [21], were being revisited to study on the established methods commonly used to measure the three variables on online consumers' behaviour - perceived trust, WOM effect, and purchase intention - intended to test the hypotheses of this project. Collecting survey data using the Likert Scale and then analyzing these data using statistical tests was the dominant process in these papers to study social presence in websites. Established survey questions that measure these three variables were extracted from these papers respectively to be adjusted and tailored to the online survey of this project research.

3.1.5 Phase 2 Analysis II - Possible *Prestashop* and *Facebook* Integration

The *Facebook* online tutorial documentations for developers were studied and additional online research was done to better understand the possible integration between *Prestashop* and *Facebook* platforms. As of this writing, there were already quite a lot of *Prestashop* e-commerce modules developed by *Prestashop* community which were integrating with *Facebook*, and were available to be customized to *ToHerHeart.com* website for the purpose of this study.

3.1.6 Phase 2 Design I - the Research Online Survey

The relevant established surveys from previously conducted studies were extracted and then adjusted for the research online survey of this project. It required the survey respondents to rate their level of agreement to each of the ten statements structured to measure the variables in the hypotheses of this project, using the five-point Likert Scale where a score of 1 denotes “Strongly disagree” and a score of 5 denotes “Strongly agree”.

The ten statements in both the online surveys were: (1) “I trust the information presented in *ToHerHeart.com*,” (2) “I feel the owner of *ToHerHeart.com* will provide me with good service,” (3) “I will share and introduce *ToHerHeart.com* to my family and friends,” (4) “I will share with my family and friends about the interesting products and services from *ToHerHeart.com*,” (5) “I will consider buying from *ToHerHeart.com* when I want to find gifts next time,” (6) “I will consider sharing my relationship struggles with the Fellowship Mentor at *ToHerHeart.com*,” (7) “I want to be notified when *ToHerHeart.com* launches new gifts, products and programs,” (8) “I have confidence in the owner's integrity and I will register as member at *ToHerHeart.com*,” (9) “I enjoy browsing or visiting *ToHerHeart.com*,” and (10) “I will browse or visit *ToHerHeart.com* again.”

Statements 1, 2, 7 and 8 measured the online consumers’ perceived trust in *ToHerHeart.com* as stated in the project hypothesis 1 (H1), while statements 3 and 4 measured the WOM effect among the online consumers within *ToHerHeart.com* as stated in hypothesis 2 (H2), and statements 5 and 6 measured the online consumers’ purchase intention in *ToHerHeart.com* as stated in hypothesis 3 (H3). Statements 9 and 10 were not directly measuring any of the variables in the project hypotheses, but they collected valuable insights to the online survey respondents’ browsing experience with *ToHerHeart.com*. This survey was crucial to measure all the three variables before and after the integration of *Facebook* social elements into *ToHerHeart.com* website interface in order to draw a comparison between the two and test the three project hypotheses.

3.1.7 Phase 2 Design II - *ToHerHeart.com* Website and *Facebook* Integration

The earlier analysis showed that it would take more effort to customize the existing *Prestashop* modules that integrate *Facebook* with *ToHerHeart.com* than to create new modules and code snippets instead. Therefore, one new module was designed to include the *Facebook Activity Feed* plug-in, a *Facebook Like Button* and a *Send Button* for *ToHerHeart.com* home page, and to be located on the right panel of *ToHerHeart.com* e-commerce website on every webpage.

Other than that, code snippets consisting of a *Facebook Like Button*, a *Send Button*, and a *Comment Box* were designed to be embedded at the end of every webpage for new post or article in *ToHerHeart.com* in order to allow online visitors to interact with other online users on the contents of that particular post or article. The similar code snippets were designed to be included in every product webpage in *ToHerHeart.com* for the same interactivity purpose.

3.1.8 Phase 2 Implementation - Developing Survey and Website Integration

The research online survey was developed using a free *Google Docs* (docs.google.com) online form and was launched to collect online consumers' behaviour in *ToHerHeart.com* before the integration of *Facebook* elements. A banner link to this pre-integration research online survey was embedded in the home page of *ToHerHeart.com* e-commerce website interface. An email invitation to visit the finalized *ToHerHeart.com* e-commerce website and to participate in answering the survey was distributed to reach random students from random colleges and universities in Malaysia, as well as random working adults that can be reached through the extended network of the author. At the same time, there was a possibility that other web visitors who did not receive the email invitation might also voluntarily participate in answering the online survey as directed from the survey banner link on *ToHerHeart.com* e-commerce website home page interface.

The customized new module and code snippets to integrate *Facebook* social elements into *ToHerHeart.com* website interface were then developed. Specific attention was also given to ensure that every link of *ToHerHeart.com* shared or posted in *Facebook* will produce the correct

image thumbnail, link title and short description. A user-based web functionality test on the *Facebook* social elements inside *ToHerHeart.com* was conducted in order to test that each of the newly integrated *Facebook* social elements was functioning as expected, as well as to obtain additional feedback and comments from the test users regarding the new integration of *Facebook* social elements into *ToHerHeart.com* website interface. This web functionality test was conducted face-to-face and also via online with 15 random test users. For the face-to-face web functionality test, the five test users involved took turns to go through each of the instructions guided by a test moderator to use every integrated *Facebook* social elements in *ToHerHeart.com*. Whereas for the online web functionality test, it was conducted via live chat with 10 random online users guided by a test moderator on the other end of the chat through the same process as the face-to-face test, and the entire chat conversations were recorded in text form.

ToHerHeart.com was re-launched after the integration of *Facebook* social elements into its website interface, and the same research online survey was duplicated in a different *Google Docs* online form and distributed again to collect online consumers' behaviour after the *Facebook* social elements integration. This post-integration research online survey was distributed using the same method as the pre-integration survey. Part of the pre-integration survey respondents also participated in the post-integration survey.

3.1.9 Phase 2 Deliverable - Analyzing and Concluding Research Outcome

The survey respondents' score on the five-point Likert Scale for their level of agreement on each of the ten statements in both the online surveys were grouped together according to the respective hypothesis variable that the statements each intended to measure, and the mean scores for each hypothesis variable from both surveys were calculated and compared.

To statistically validate the obtained survey result, a t-Test was conducted for the scores in each of the three variable data groups, using an online t-Test calculator provided by *GraphPad Software* (www.graphpad.com) - a 28-year-old data analysis, statistics and graphing company. The result and analysis of the t-Test from *GraphPad Software* were presented and discussion of

the result was drawn. The t-Test is one of the methods commonly used in previous similar studies to know if the changes in the mean score for each of the hypothesis variables were statistically significant.

3.2 Tools Required

The vital tools required to conduct each of the major activities of this project phase 1 respectively are: (1) for *ToHerHeart.com* e-commerce website transformation and enhancement: *ToHerHeart.com* business portfolio and business plan, a computer with stable internet connection, *ToHerHeart.com* former website hosted by *Yola*, *Prestashop* e-commerce solution open-source codes version 1.4.9.0 (latest official version as of this writing), and *Arvixe* hosting account, and (2) for the user-based lab test on web usability: MIMOS Berhad Test Lab with the Tobii T60 Eye Tracker and audio recorder, test users, test moderator and observer.

For phase 2, the tools required to conduct each major activity are: (3) for the research online survey development: established survey questions references from previous social presence-related studies (Cyr, Bonanni, & Ilsever, 2004, as cited in Ref. [5]; Cyr, Bonanni, Bowes, & Ilsever, 2005, as cited in Ref. [5]; van der Heijden, Verhagen, & Creemers, 2001, as cited in Ref. [11]; Gefen & Straub, 2003, as cited in Ref. [11]; Bhattacharjee, 2001, as cited in Ref. [16]), free online survey tools like *Google Docs* online forms and online survey respondents, (4) for *Facebook* integration code snippets development and customization: *Facebook* online tutorial documentations for web developers, *Prestashop* modules development online tutorials, and existing Facebook-related web modules, (5) for the user-based web functionality test on the function of the integrated *Facebook* social elements in *ToHerHeart.com* website interface: stable online chat system, test users and test moderator, and (6) for survey results analysis: the collected survey results and the online t-Test calculator from *GraphPad Software*.

3.3 Project Gantt Chart and Key Milestones

A project Gantt chart as shown in Fig. 3.2 below has been outlined to better visualize the progress timeline of the entire project which has been discussed in depth in the previous sections. The two key milestones of the entire project were the launching of both the pre-integration and post-integration research online surveys under the implementation stage in phase 2 - on the 1st and 18th of July 2012 respectively, in order for sufficient survey data to be collected for analysis, and the final research outcome to be eventually concluded and delivered.

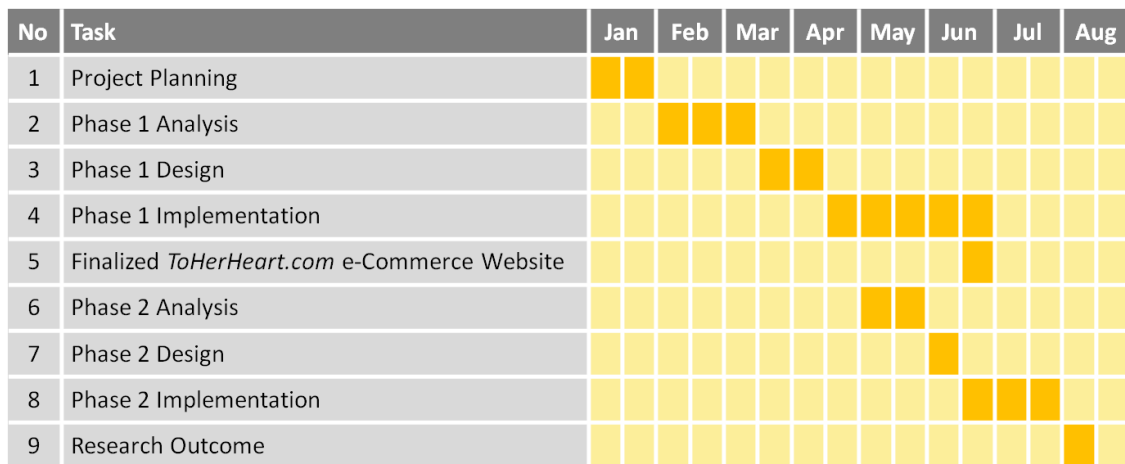


FIGURE 3.2. Gantt chart of the entire project.

CHAPTER 4

RESULT AND DISCUSSION

4.1 User-based Web Usability Lab Test Observations

The user-based lab test on web usability that was conducted at MIMOS Berhad Test Lab consisted of five test cases assigned to each participating test user to be completed within one hour with the assistance of a moderator throughout the test. The test cases were: (1) “Next Friday is your partner’s birthday; you wish to buy him/her a small gift. You have a budget of RM30 to buy a gift for your partner. What are the 2 gifts that you think is most suitable for your partner,” (2) “Read the description of each product,” (3) “Find the product comparison tool and compare the price of ‘Love Letter Keychain’ and ‘3D Character Keychain’,” (4) “You are a new user of this website. Create a new account for this website,” and (5) “You do not wish to buy anything today. You want to log off the account.” One challenge faced during this lab test was to have the web hosting server down when the sixth user was doing test case 2. Therefore, the remaining test of the sixth user was moderated without the live website, but an objective interview was conducted between the moderator and the sixth user instead.

4.1.1 Test Case 1 Observations and Users’ Feedback

Half of the users did not realize or they took some time to realize the existence of the “Gift” menu in the top navigation bar to start their product browsing. Three out of six users suggested to have an additional product category that holds all the products sold in order to allow visitors to choose gift from all the products that are available, instead of having to browse through every product category to see what gifts are available in each category separately. Other suggestions included enabling product filtering function and eliminating malfunctioning links.

4.1.2 Test Case 2 Observations and Users' Feedback

Almost all users requested that website uses larger text fonts. Two users commented that the product descriptions could come with more practical details, like how long would it take for the customers to receive the ordered products from the time the order is placed, as well as how to practically use some of the interesting products that might be new and unfamiliar to customers. Contrarily, other four users commented that the existing product descriptions were sufficient to help them make purchase decision. One user mentioned that he would initiate to contact the web owner to clarify on any doubt before placing order, of which an active chat with the web owner will be favourable.

4.1.3 Test Case 3 Observations and Users' Feedback

Three users skipped this test case due to the difficulty in locating the product compare button, while the last user did not participate in accomplishing test cases 3 through 5 due to the unexpected downtime of the web hosting server. For the two users who managed to accomplish this test case, they both commented that the overlapping interface which occurred when comparing three products distracted their browsing experience. Another suggestion was to allow customers to add the product into comparison basket right from the product page itself instead of only enabling the comparison button in product category page. However, one user mentioned that it is not necessary to have the compare button for choosing gifts to purchase.

4.1.4 Test Case 4 Observations and Users' Feedback

Among the five users who did this test case, all were able to locate the log in button very quickly but two were reluctant to create an account as requested by the test case due to privacy concern of personal information over the Internet. However, all five users created their respective accounts in order to accomplish this test case. Suggestions received included adding tooltips on required fields which are generally unfamiliar to users on the account registration form, eliminating unnecessary fields required in order

to make purchase, displaying welcoming message to explicitly inform web visitors that they have been successfully logged in, and allowing registered web visitors to personalize the website theme colour according to their preference. Besides, the position of the displayed user's name after logging in overlapped other web content due to long user name.

4.1.5 Test Case 5 Observations and Users' Feedback

All five users who did this test case managed to locate the log out button very quickly and they could log out successfully. One user suggested adding a confirmation dialogue box to confirm the users' intention to log out.

Fig. 4.1 below summarizes the observation data on the website defects or usability issues from users 1 to 6 (U1 to U6) and observer (Ob), as well as the action taken for each of the defects or issues.

Quality & Functionality	U1	U2	U3	U4	U5	U6	Ob	Criticality	Remark
Inconsistency and design flaws in webpage layout	✓	✓	✓	✓	✓	✓	✓	5/7 = 71.4%	Solved
Insufficiency in product choices	✓	✓	✓	✓	✓	✓	✓	2/7 = 28.6%	
Discovery of non-functioning links	✓	✓	✓	✓	✓	✓	✓	3/7 = 42.9%	Solved
Difficulty to locate Product Compare tool	✓	✓	✓	✓	✓	✓	✓	6/7 = 85.7%	Partially solved
Lack in product filter function	✓	✓	✓	✓	✓	✓	✓	2/7 = 28.6%	Solved
Disintegration between wishlist and cart	✓	✓	✓	✓	✓	✓	✓	1/7 = 14.3%	Function held
Preferability to view all products	✓	✓	✓	✓	✓	✓	✓	4/7 = 57.1%	Solved
User-friendliness	U1	U2	U3	U4	U5	U6	Ob	Criticality	Remark
Difficulty to understand some required field at sign-up	✓	✓	✓	✓	✓	✓	✓	2/7 = 28.6%	Solved
Difficulty to read due to small font size	✓	✓	✓	✓	✓	✓	✓	5/7 = 71.4%	Solved
Incomprehensibility of page menu title	✓	✓	✓	✓	✓	✓	✓	3/7 = 42.9%	Solved
Inflexibility to personalize website theme color	✓	✓	✓	✓	✓	✓	✓	1/7 = 14.3%	
Insufficiency in product description	✓	✓	✓	✓	✓	✓	✓	3/7 = 42.9%	Solved
Insufficiency in product delivery information	✓	✓	✓	✓	✓	✓	✓	1/7 = 14.3%	Solved
Confusion between sign-up and log in buttons	✓	✓	✓	✓	✓	✓	✓	1/7 = 14.3%	Solved
Need for restructuring certain phrases and sentences	✓	✓	✓	✓	✓	✓	✓	3/7 = 42.9%	Solved
Trust & Social Presence	U1	U2	U3	U4	U5	U6	Ob	Criticality	Remark
Insecurity to provide personal information online	✓	✓	✓	✓	✓	✓	✓	2/7 = 28.6%	
Preferability to purchase directly from seller over online	✓	✓	✓	✓	✓	✓	✓	1/7 = 14.3%	
Lack sense of welcoming after log in	✓	✓	✓	✓	✓	✓	✓	1/7 = 14.3%	Solved
Lack confirmation prior to log out	✓	✓	✓	✓	✓	✓	✓	1/7 = 14.3%	
Lack customer support via email contact or live chat	✓	✓	✓	✓	✓	✓	✓	1/7 = 14.3%	Solved

FIGURE 4.1. Summary of user-based lab test observations and actions taken.

4.2 *ToHerHeart.com* Business Strategies Enhancement

The former *ToHerHeart.com* website consisted of mainly the online gift shop, monthly featured dating idea, and a form for web users to share their relationship struggle with the founder of *ToHerHeart.com* for advice and guidance to overcome their struggle. Other than the gifts, the dating idea and relationship advice were both offered for free.

The analysis of this project has identified several value-adding business strategies that can be translated into new web services to be offered in *ToHerHeart.com*. These include daily encouragement short article and occasional purposeful program to better engage web visitors more frequently. In addition, the monthly featured dating idea was extended to monthly featured fellowship idea in order to reach out more and be relevant to a wider group of content consumers other than just those who are in a boy-girl-relationship.

4.3 *ToHerHeart.com* Website Enhancement

There were many areas of enhancement developed for *ToHerHeart.com* website through this project. Among the significant ones are (1) moving it from a basic website platform to an actual e-commerce website platform, (2) customizing the website interface for *ToHerHeart.com* theme, and (3) adding the new web services into the entire website structure.

Other than these, the extended e-commerce tools readily available in *Prestashop* has brought *ToHerHeart.com* website to a whole new level in terms of functioning as a professional e-commerce website. Several major upgrades in its e-commerce system include (1) the establishment of its own customer management system within *Prestashop* back office from a simple customer database system provided externally by *Ecwid* formerly, (2) having its own product catalogue management system in-house instead of one that was hosted externally by *Ecwid* in the former website, and (3) the extension of valuable e-commerce functions such as customer loyalty programme and rich product filter tool.

Fig. 4.2 below shows the screenshot of the former *ToHerHeart.com* website home page before taking part in this project, whereas Fig. 4.3 on the following page shows *ToHerHeart.com* website home page screenshot after the first transformation effort under this project phase 1. After conducting the user-based lab test on web usability, the website was further enhanced and customized by incorporating the prioritized web re-development and minor re-structuring after analyzing the collected observations and test users' feedback, as well as the value-adding web services that were newly added into *ToHerHeart.com* business portfolio. Fig. 4.4 that follows next shows *ToHerHeart.com* finalized home page screenshot when it was re-launched after being closed down for several months for the progress of this project.



FIGURE 4.2. Former *ToHerHeart.com* website home page screenshot.

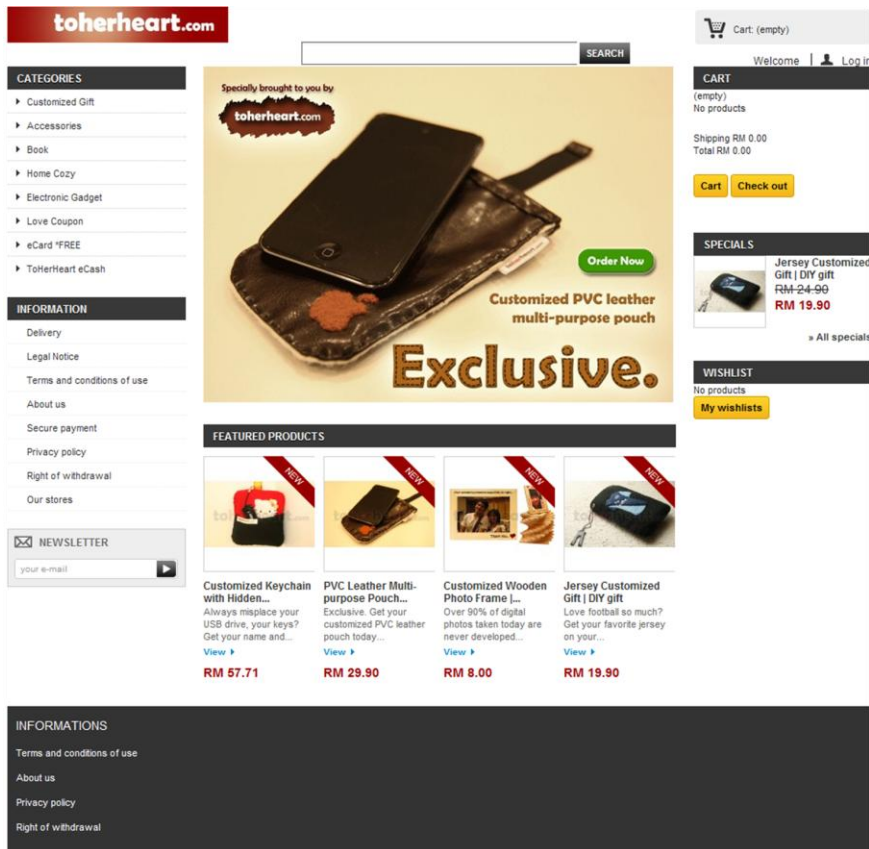


FIGURE 4.3. Enhanced *ToHerHeart.com* website home page screenshot.

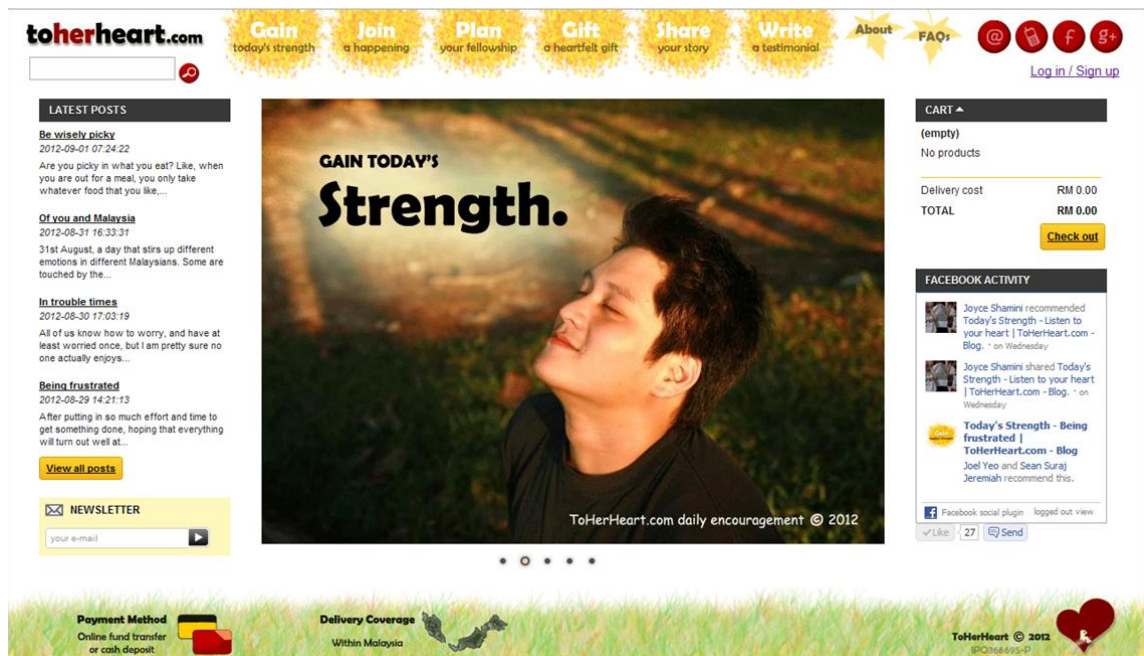


FIGURE 4.4. Finalized *ToHerHeart.com* website home page screenshot.

4.3.1 From a Basic Website to an e-Commerce Website

The former *ToHerHeart.com* was built on *Yola*, which had not much e-commerce tools back when *ToHerHeart.com* website was first built. Although recently *Yola* has introduced more e-commerce tools with a monthly fee, *Prestashop* still provide way much more tools essential for an e-commerce website available and customizable at no charge.

Fig. 4.5 below shows a screenshot of the catalogue page featuring three of the new e-commerce tools provided by *Prestashop* which were not available in the previously used catalogue system provided by *Ecwid* or in *Yola* itself. Tool 1 is a richly customizable product filter tool, tool 2 is the product compare button which will show the product features comparison between the selected products, and tool 3 is the product sales management gadget which randomly displays the current sales.

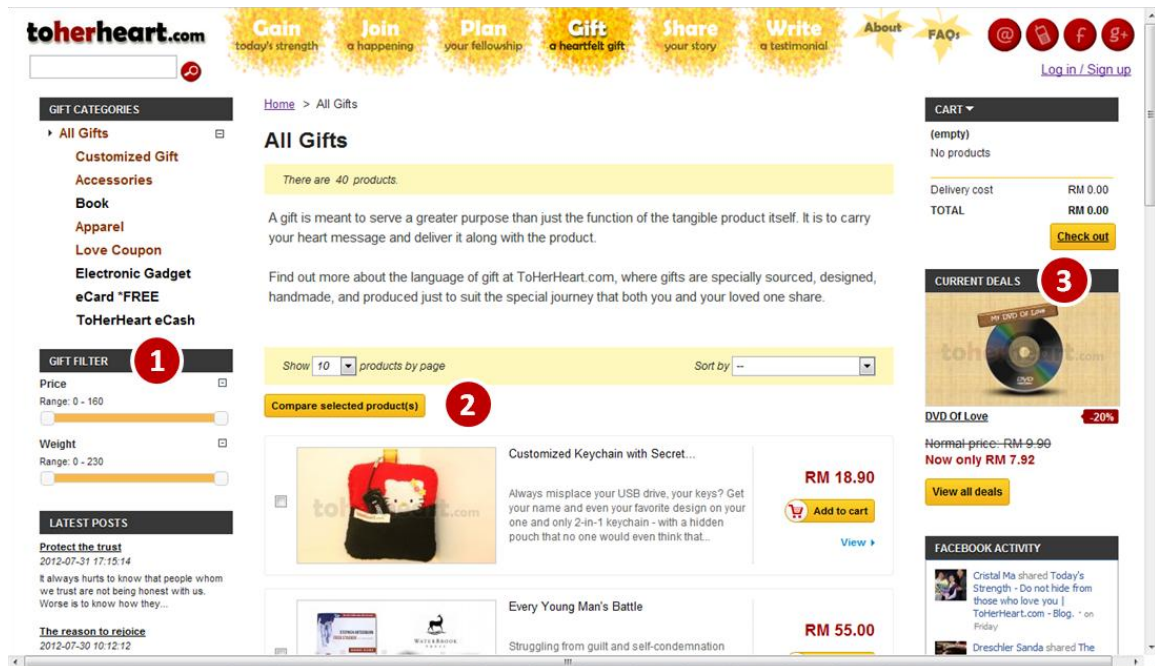


FIGURE 4.5. *ToHerHeart.com* gift page screenshot with new e-commerce tools.

4.3.2 Customizing the Website Interface for *ToHerHeart.com* theme

Comparing the home page screenshots from Fig. 4.2 and Fig. 4.4 above respectively, the website interface of *ToHerHeart.com* has been significantly enhanced to establish a brand appearance theme for the business because *Prestashop* allows a 100% of website layout customization while *Yola* only gives part of this customizability, and that customization is only available with an exclusive account with *Yola*.

4.3.3 Adding New Services into *ToHerHeart.com* Business Portfolio

The two new web services added into *ToHerHeart.com* e-commerce website are (1) the daily encouragement short article under the “Gain today’s strength” menu, and (2) the occasional purposeful program and event under the “Join a happening” menu. Both of these are content-based web services to better engage web visitors with frequently updated contents. Fig. 4.6 below highlights the link to both of these new web services.

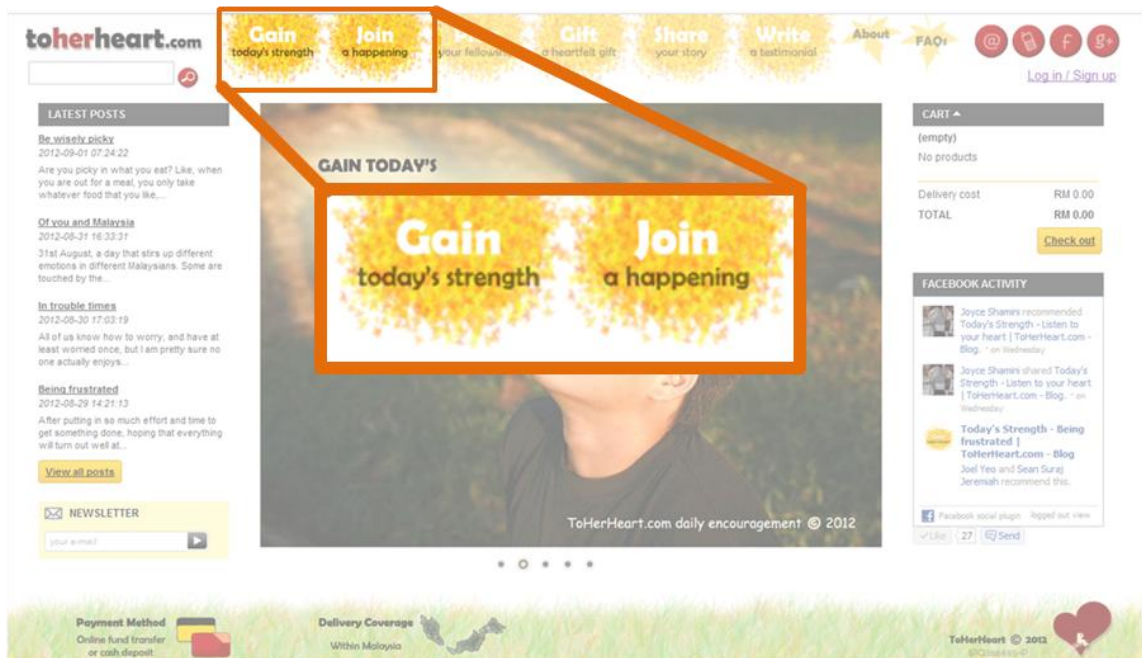


FIGURE 4.6. Menu links to the newly added web services.

4.3.4 Establishing the Built-in Customer Management System

As mentioned earlier, *Prestashop* comes with a complete built-in customer management system while *Ecwid* only provides a simple customer database system, integrated with its product catalogue management system. By having a complete customer management system in-house, *ToHerHeart.com* can have more thorough insights to its online consumers and therefore make it possible to build deeper relationship with them. Fig. 4.7 and Fig. 4.8 below show the back office views of both the customer database system by *Ecwid* and customer management system by *Prestashop* respectively.

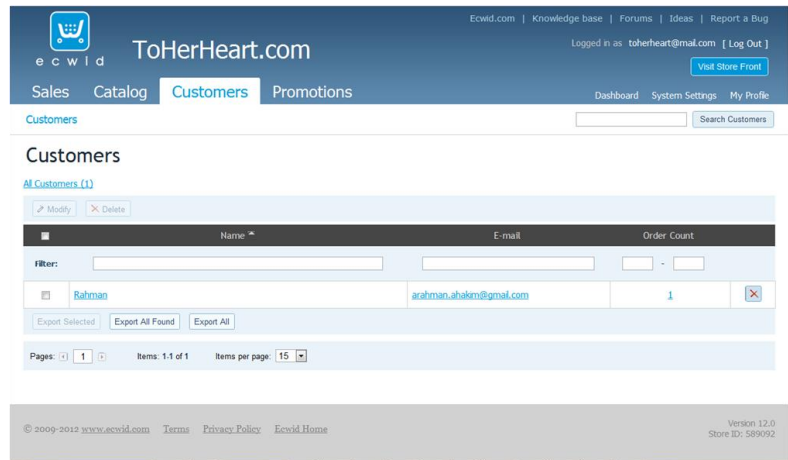


FIGURE 4.7. Ecwid customer database system back office.

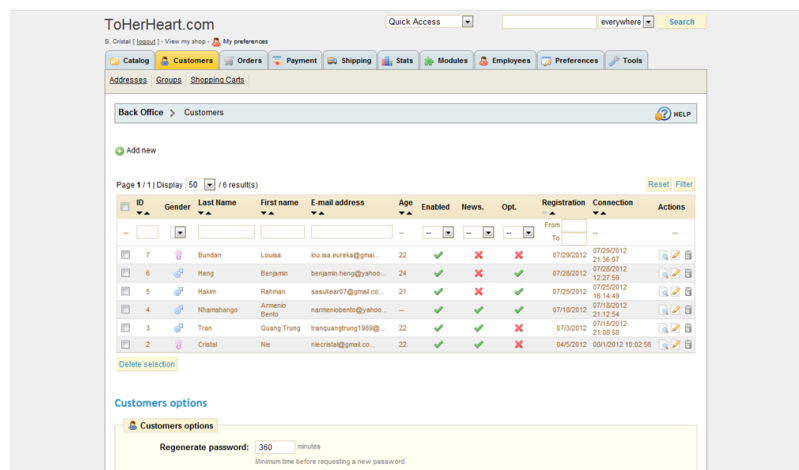


FIGURE 4.8. Prestashop customer management system back office.

4.3.5 Establishing the Built-in Catalogue Management System

Available along with *Prestashop* e-commerce solution is the in-house catalogue management system that *ToHerHeart.com* no longer has to embed external online catalogue software provided by *Ecwid* or other online catalogue software. Fig. 4.9 and Fig. 4.10 below show the back office views of both the catalogue management system from *Ecwid* and from *Prestashop* respectively.

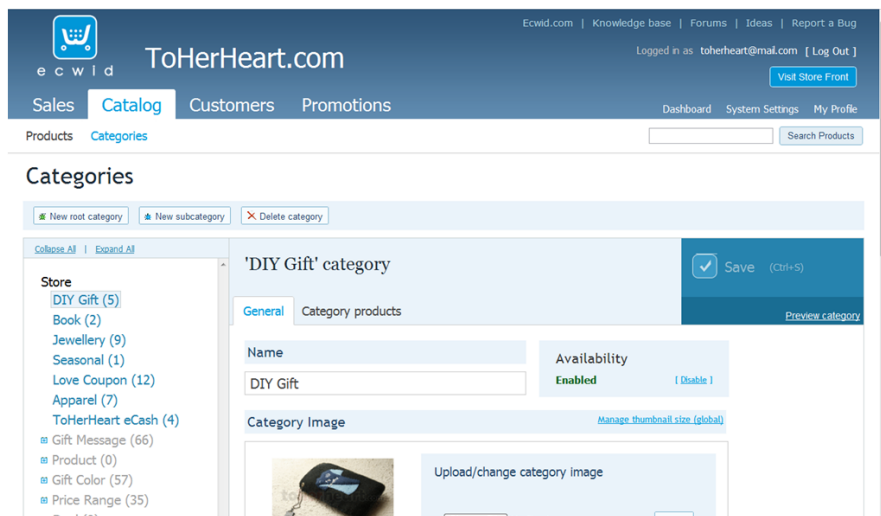


FIGURE 4.9. *Ecwid* product catalogue management system back office.

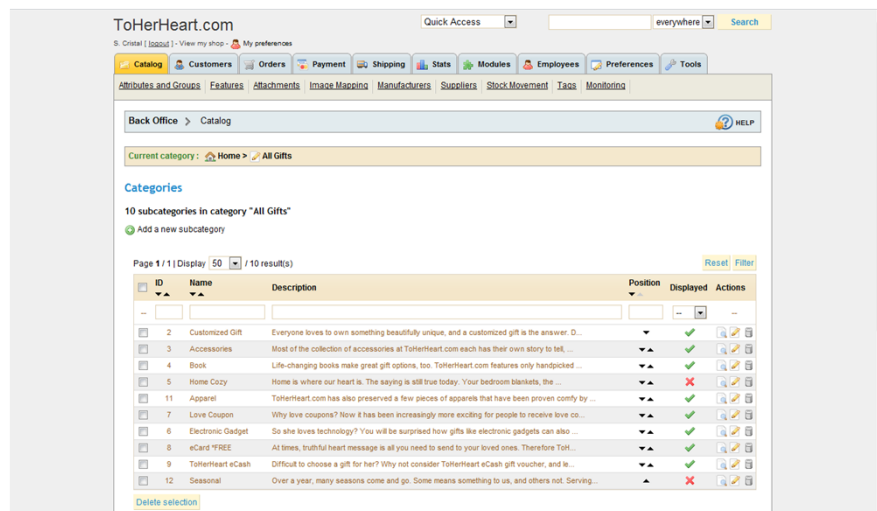


FIGURE 4.10. *Prestashop* product catalogue management system back office.

4.4 User-based Web Functionality Test Observations

From the user-based web functionality test that was conducted to test the newly integrated *Facebook* social elements in *ToHerHeart.com* website interface, all these social elements were functioning well as expected from the web users' end. However, there was an error with the *Facebook Send Button* in the integrated web module on *ToHerHeart.com* website home page from the administrator's end. This error was further investigated and was found to be a *Facebook* development bug on the administrator's end, but as of this writing there was no response to how this bug could be solved [12]. Nevertheless, this bug did not affect the functionality of the *Facebook* social elements at the web users' end and was thus not a priority concern to this project.

4.5 Survey Mean Score Simple Comparison Result

The mean scores for all the three variables measured in the project hypotheses, (H1) perceived trust, (H2) WOM effect, and (H3) purchase intention, were charted on the five-point Likert Scale, comparing the data collected from both the pre-integration and post-integration online surveys as shown in Fig. 4.11 below.

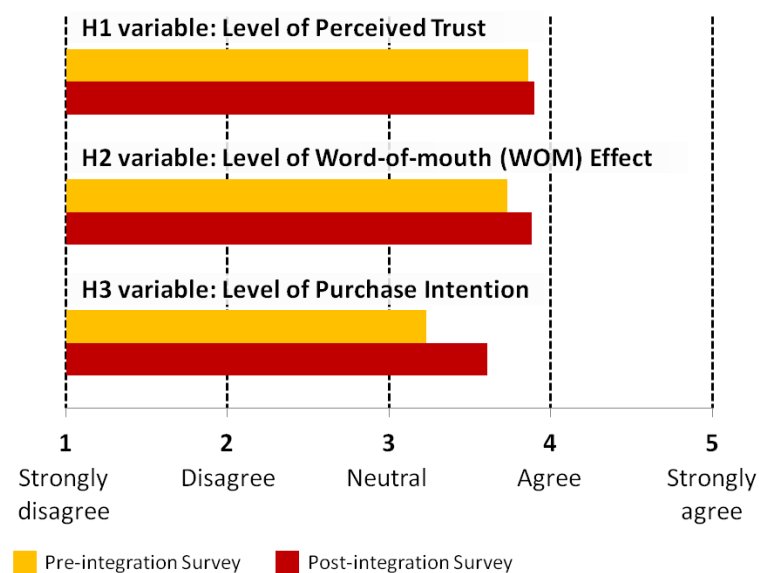


FIGURE 4.11. Mean score comparison result from both surveys.

According to the mean score comparison result, for H1 and H2, the mean scores increased slightly for both the online consumers' perceived trust of *ToHerHeart.com* and the WOM effect among them within *ToHerHeart.com* after the integration of *Facebook* social elements, but it remained in the same range between “Neutral” and “Agree”. As for H3, the integration of *Facebook* social elements into *ToHerHeart.com* website interface has increased the mean score of online consumers' purchase intention relatively more than that of H1 and H2, but it still remained in the range between “Neutral” and “Agree”.

4.6 Survey Data t-Test Result

Fig. 4.12 below shows the screenshot of the online t-Test calculator result by *GraphPad Software* for the data collected from both the pre-integration and post-integration research online surveys intended to measure H1 variable. The increase in online consumers' perceived trust in *ToHerHeart.com* from before to after the integration of *Facebook* social elements into the website interface was statistically not significant. In other words, this increase was likely to happen by chance.

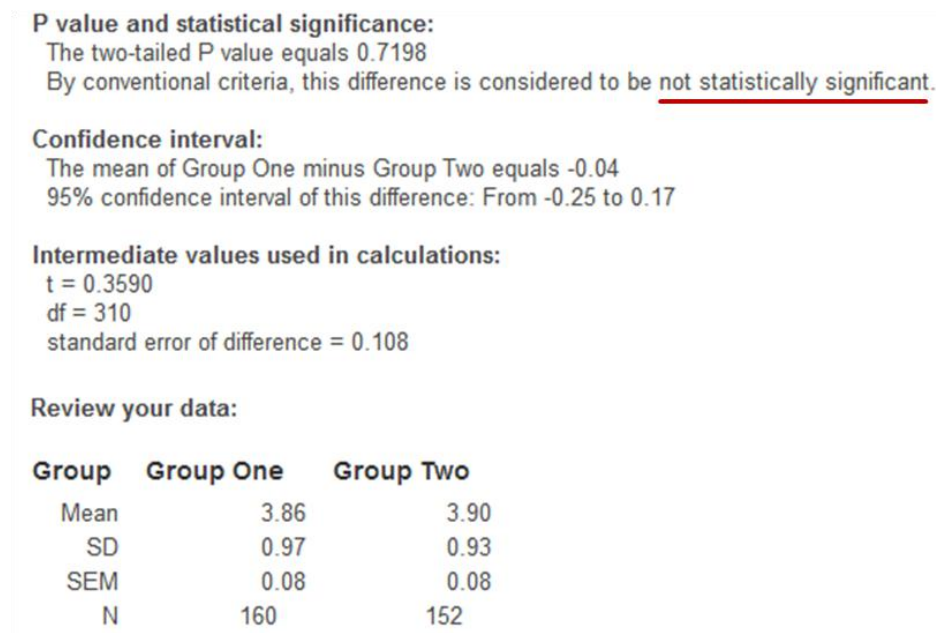


FIGURE 4.12. Screenshot of H1 online t-Test calculator result.

Under the “Review your data:” section, the sample size, N , was 160 for *Group One* because there were 40 survey responses collected from the first-batch online survey, and recall that there were four statements - statements 1, 2, 7 and 8 - in the survey that measured H1 variable. Thus, the scores for each of the four statements from these 40 respondents were grouped together and totalled to a sample size of 160 (= 40 responses x 4 statements) for H1 in the pre-integration survey. Similarly for *Group Two* sample size, N , there were 38 survey responses collected from the second-batch online survey, which totalled to a sample size of 152 (= 38 responses x 4 statements) for H1 in the post-integration survey.

Also from *GraphPad Software*, the following Fig. 4.13 shows the screenshot of the online t-Test calculator result for the obtained scores from both online surveys intended to measure H2 variable. The increase in the WOM effect among the online consumers within *ToHerHeart.com* from before to after integrating *Facebook* social elements into the website interface was again considered statistically not significant, and that this increase was likely to occur by chance as well.

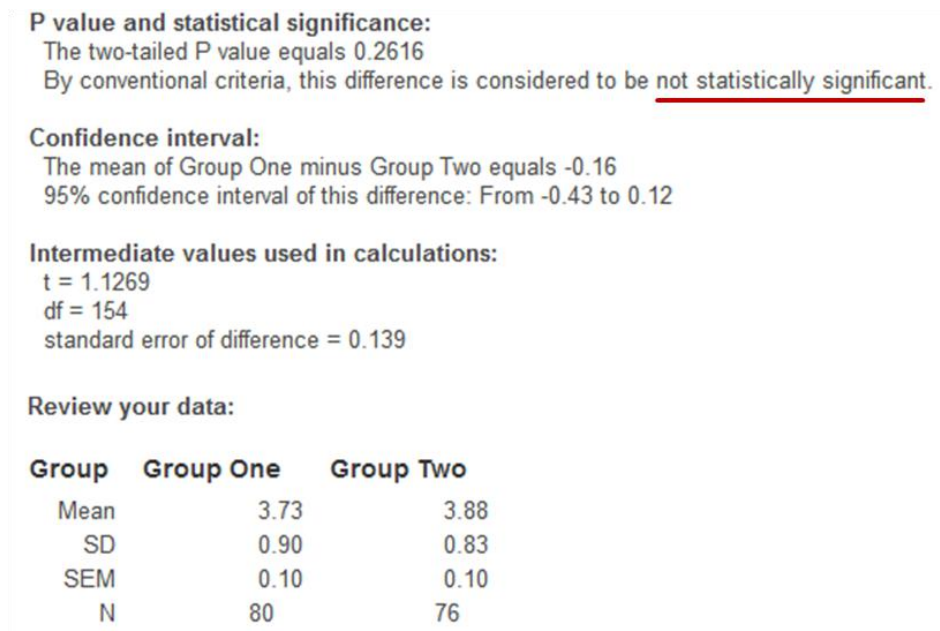


FIGURE 4.13. Screenshot of H2 online t-Test calculator result.

The sample size, N , under the “Review your data:” section, was 80 for *Group One* because there were only two statements - statements 3 and 4 - in the survey that measured H2 variable. Thus, the scores for each of the two statements from these 40 respondents were grouped together and totalled to a sample size of 80 (= 40 responses x 2 statements) for H2 in the pre-integration survey, and 76 (= 38 respondents x 2 statements) in the post-integration survey *Group Two*.

Below is Fig. 4.14 showing the screenshot of the online t-Test calculator result by *GraphPad Software* for the scores from both online surveys intended to measure H3 variable. The increase in online consumers’ purchase intention in *ToHerHeart.com* from before to after the integration of *Facebook* social elements into the website interface was considered to be statistically significant, that this increase did not happen by chance.

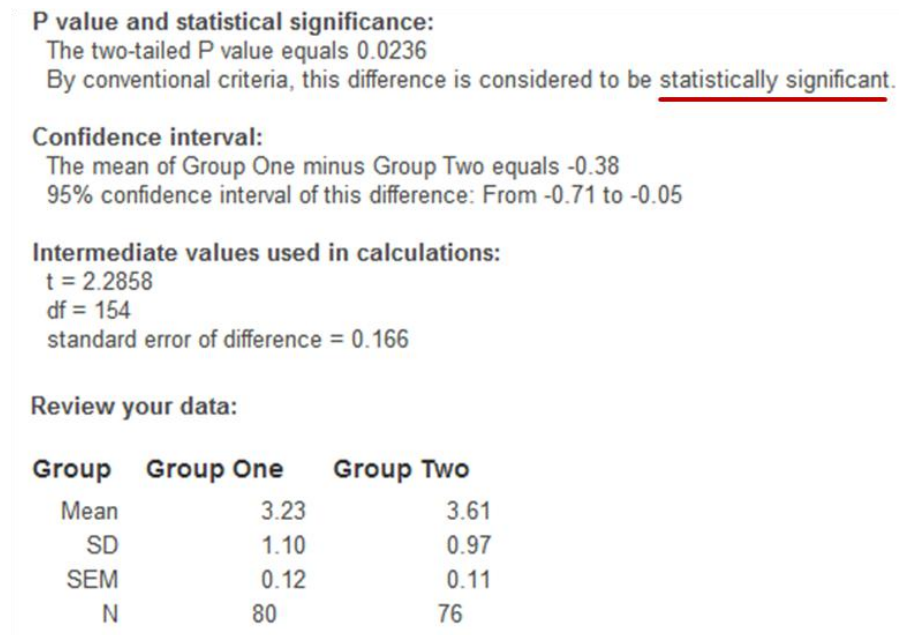


FIGURE 4.14. Screenshot of H3 online t-Test calculator result.

As there were also two statements - statements 5 and 6 - in the survey that measured H3 variable, the sample size, N , under the “Review your data:” section for *Group One*

totalled to 80 (= 40 responses x 2 statements) for H3 in the pre-integration survey and for *Group Two* the post-integration survey, 76 (= 38 respondents x 2 statements).

4.7 Discussion on the Result Obtained

The increase in the mean score of online consumers' purchase intention in *ToHerHeart.com* after integrating *Facebook* social elements into the website interface was considered statistically significant, but it still did not reach the "Agree" scale on the five-point Likert Scale. This could be caused by its initially low mean score during the pre-integration survey, which was very near to "Neutral," leaving a huge gap before it could reach "Agree" even after the integration *Facebook* social elements into *ToHerHeart.com* website interface. Unlike the mean scores of both the online consumers' perceived trust and WOM effect among them in the website, both mean scores were already near the "Agree" scale. However, the *Facebook* social elements integration did not bring significant impact to increase both variables to pass the "Agree" scale on the five-point Likert Scale.

Interestingly, the survey results suggested a value-chain pattern resulted from the synergized impact of integrating socially-rich photos and text contents, together with the highly interactive *Facebook* social elements into *ToHerHeart.com* website interface. In other words, integrating *Facebook* social elements alone into *ToHerHeart.com* website interface without other social elements, like the socially-rich photos and text contents, may not give the same level of positive impact to the three variables studied in this project - online consumers' perceived trust, WOM effect among them, and their purchase intention in *ToHerHeart.com*.

Following that, the high daily interactivity rate in SNSs like *Facebook* may also be a value-chain result of the synergized impact of interactively blending together SNSs communities' photos, their text-based contents, and all the social elements in the SNSs, such as *Facebook Like Button* and *Comment Box* in *Facebook*.

In addition to that, it is important to note that both the research online surveys were distributed and their results collected after resolving the prioritized system defects and usability issues of

ToHerHeart.com which were obtained from the user-based web usability lab test observations and test users' feedback. This suggested that the mean scores collected for each of the three hypothesis variables in both surveys could be respectively lower without thoroughly testing the usability of *ToHerHeart.com* e-commerce website to identify and resolve the system defects and usability issues.

Similarly, the mean scores for the three hypothesis variables collected from the post-integration survey could also be lower if any of the integrated *Facebook* social elements in *ToHerHeart.com* did not function as expected, for dysfunctional web features would affect the overall website usability.

CHAPTER 5

CONCLUSION AND RECOMMENDATIONS

5.1 Conclusion

From the results obtained, the integration of *Facebook* social elements have slightly increased the online consumers' perceived trust, WOM effect among them, and their purchase intention in *ToHerHeart.com* as a whole. However, the increased mean scores for all these three variables still remained in the range between "Neutral" and "Agree" on the five-point Likert Scale after integrating *Facebook* social elements into *ToHerHeart.com* website interface, although slightly moving towards "Agree." Thus, the three hypotheses of this project cannot be accepted. Although the increase in purchase intention was considered significant through the t-Test conducted for H3 variable, it cannot confidently support the hypothesis because the H3 variable mean score still did not achieve the minimal "Agree" scale on the five-point Likert Scale.

Other than that, businesses can improve the social presence in their e-commerce websites by putting together many different social elements including product images, socially-rich text descriptions, and SNSs social elements to utilize the synergized impact these socially-rich combination could establish. On the other hand, the social impact on online consumers' behaviour may not be as strong when these social elements are individually integrated into the e-commerce website interface.

Besides, proper user-based web usability test and full web functionality test play crucial roles in ensuring a fully functioning website without defect to improve online consumers' browsing experience, which is favourable for encouraging closed sales online.

Furthermore, both building business web presence solely in SNSs and building business web presence in an e-commerce website each have their own advantages and disadvantages. Therefore, businesses can optimize the advantages from both options of building business web presence and minimize the disadvantages from both by first, building their own e-commerce websites, and at the same time setting up their business webpage in the SNSs to enhance social engagement with their online consumers.

5.2 Recommendations

Several recommendations on different aspects can be drawn from this entire project, which include (1) suggestions for improving *ToHerHeart.com* business, (2) advices for new businesses who desire to go online, and thirdly (3) a list of brief ideas on research topics that can be expanded from this study in the future.

5.2.1 Suggestions for Improving *ToHerHeart.com* Business

Since the major web services offered in *ToHerHeart.com* evolve around giving advices or consultation on relationships, *ToHerHeart.com* can greatly gain credibility in performing this area of services by having a certified relationship consultant as the main team player in providing these advice and consultation. As of this writing, *ToHerHeart.com* is operating by its founder alone. Thus, a more practical suggestion would be for the founder to attend related training and course in order to obtain minimum qualification as a relationship consultant. Alternatively, *ToHerHeart.com* can opt to hire a relationship consultant with an acceptable level of qualification.

In addition, *ToHerHeart.com* gift catalogue is considerably small in size as of this writing, having a very limited choice of gifts available to draw attention from more web visitors. Two of the six test users in the user-based lab test on web usability actually raised this concern as well, and they suggested that *ToHerHeart.com* expands its gift varieties. The current concern of *ToHerHeart.com* regarding this is its limited financial capital to purchase more inventories to be stored up for sale in the website. Considering

this, *ToHerHeart.com* can either seek investment fund from investors who are interested in its business portfolio, or it can choose to change its business revenue model. The current business revenue model of *ToHerHeart.com* is the web catalogue revenue model where products are bought or made, and then sold for a profit. *ToHerHeart.com* can consider combining this revenue model with the fee-for-transaction revenue model where it can additionally allow other producers or sellers to sell their relevant products in *ToHerHeart.com* by charging a service fee on every successful purchase. By implementing this combined business revenue models, the gift catalogue size in *ToHerHeart.com* can be increased without adding burden unto its financial capital for purchasing more inventories.

5.2.2 Advices for New Businesses Who Desire to Go Online

One of the major values of this project is to provide reliable guide to new businesses who are at the crossroad of deciding how and where to build their web presence when they plan to go online. As suggested by the result of this study, new businesses or existing small businesses who are planning to go online are advised to invest in their own e-commerce websites as their main web presence, and at the same time set up business webpage in SNSs, like *Facebook Page* or *Google+ Pages*, as their additional web presence in order to optimize the business benefits of both while minimizing the major ownership-related issues associated with building web presence solely in SNSs.

Furthermore, the result of this study shows that it is crucial to conduct professional web usability test on the e-commerce website before launching it to the public. Through the web usability test, the developer of the e-commerce website will be able to identify any system defect or functionality issue and further improve the website. This is important because a user-oriented website design can help establish the social impact within the website up to a certain level. Of course, businesses can further increase the social impact within its e-commerce website by integrating popular social elements from SNSs such as the *Facebook* social elements that were integrated into *ToHerHeart.com* website interface.

5.2.3 Research Topics to be Expanded from this Study

Several interesting research topics can be expanded from where this study stopped. Firstly, since this study covered only the integration of social elements from *Facebook* into the e-commerce website interface, the integration of social elements from other SNSs, such as *Google Plus* (plus.google.com) and *LinkedIn* (www.linkedin.com) which each caters for slightly different groups of market respectively, can be a valuable research area to justify if there is different social impact on online consumers' behaviour by integrating social elements from different SNSs into the same e-commerce website interface.

Secondly, the impact of integrating *Facebook* social elements into the interface of a website that has no other social elements, like the socially-rich relevant photos or text descriptions, can be another valuable research topic to analyze the actual impact that can be contributed by the integration of *Facebook* social elements into e-commerce website interface alone, and at the same time justifying the existence of synergized social impact by blending all the different social elements together creatively in an e-commerce website interface.

Thirdly, the eye-tracking data, which were also collected from the user-based web usability lab test but were not used yet for the purpose of this study, can be utilized to conduct further study on the impact of locating different social elements at different positions respectively in an e-commerce website interface.

Next, since this project studied on the impact of integrating *Facebook* social elements into the website interface of an e-commerce selling all kinds of products - *ToHerHeart.com*, this research can be conducted across different subjects of study - websites of different business natures each selling specialized products - to justify if the social impact resulted from the integration of *Facebook* social elements into the website interface of different business natures will still remain the same as with this project.

Last but not least, a new study can be done to verify the seriousness of the major ownership-related issues associated with businesses solely setting up business webpage in SNSs without having own business website, as mentioned earlier in this paper. The outcome of this study will further equip new businesses if these major ownership-related issues are really critical to be avoided and that it is truly worthwhile for businesses to invest in an e-commerce websites regardless of whether or not the businesses have set up a business webpage in SNSs.

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Integrating Social Networking Sites into e-Commerce Website: A Study on Online Consumer Behaviour

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Abstract-The high interactivity rate in social networking sites (SNSs) has drawn the attention of many researchers and businesses. However, this has at the same time made it difficult for businesses to decide where to build their web presence - in their e-commerce website or in SNSs. Therefore, this project, embracing the methodology of rapid application development (RAD), aims to study the impact on the online consumers' behaviour, particularly in their perceived trust, word-of-mouth (WOM) effect among them, and their purchase intention in the e-commerce website, by integrating *Facebook* social elements into the website interface of an e-commerce website, *ToHerHeart.com*. A research online survey was developed and distributed before and after this integration. The research outcome shows that the positive impact of this social integration was generally not significant to accept the project hypotheses; integrating *Facebook* social elements into *ToHerHeart.com* e-commerce website interface does not really increase the online consumers' perceived trust, WOM effect among them, and their purchase intention in *ToHerHeart.com*. The research outcome also suggests that businesses build their e-commerce website and at the same time set up their business webpage in SNSs to optimize the business advantages of both and minimize the overall disadvantages. Recommendations for future research were also outlined in this paper.

Keywords-online consumer behaviour; e-commerce; social networking sites; *Facebook*; social presence; *ToHerHeart.com*

I. INTRODUCTION

A. Background of Study

The Social Presence Theory - the presence of interaction opportunity between real people - introduced by Short, Williams, & Christie [22] has been one of the popular research areas for many years, even in the field of business. More people are driven to spend more time over the Internet in this current technology era [3]. In fact, the active participation in social networking sites (SNSs) today has already fused into the general society as part of the culture [20]. This acculturation is one of the major factors that contribute to the growing research interest in the study of social presence over the Internet.

Social presence has always been very essential to e-commerce websites due to the cold and impersonal

nature of the virtual environment in the online world [1,5,8,16]. Besides, people are made to be relational beings who naturally desire interaction with one another. When these two natures are related to online consumer behaviour, real human interaction and human warmth in the e-commerce website environment become crucial in order to engage the online visitors better, and to eventually convert them into consumers.

As businesses gradually realize the importance of social presence in the online business environment, many have started to integrate social presence elements into their e-commerce websites interface. For example, most of the e-commerce websites provide photos of the products they are selling in addition to short text product descriptions in order to better interact - although electronically - with the online consumers about the products they are trying to sell. Some businesses advance further to include forum and live chat into their websites. The powerful combination of these social presence elements is what makes SNSs, like *Facebook* (www.facebook.com), so successfully populated [24].

Many businesses have also been drawn to participate in SNSs, due to the high daily activity rate in SNSs like *Facebook* [24], by setting up their social business webpage where their online consumers can receive timely feeds of their latest products or promotional information via the interactive platform provided by SNSs. These SNSs do not just help businesses disseminate marketing information more easily and effectively, they also make it possible for the online consumers to spread the marketing information to family and friends within their own social networking groups easily and conveniently with just few clicks - a powerful viral marketing advantage at no cost for the businesses.

B. Problem Statement

Due to the great business benefits associated with the SNSs which have been proven capable of increasing online sales for businesses, some especially the small-business start-ups mistakenly assume that it is sufficient to set up a social business webpage in SNSs as their only web presence - the presence of the business in the

Internet, that they do not need to build their own e-commerce websites. A few examples of such businesses are *Xuan's Bakery*, *Question Mark Enterprise.co* and *Q-Love Fashion Street* which are all 'online shops' set up in *Facebook* without their own websites. Building web presence in SNSs alone may seem to be sufficient for small businesses that do not envision growing bigger in the future, but it will raise several critical ownership-related issues for businesses that value long-term growth and online consumer engagement.

1) *Loss of Business Data Ownership*: Firstly, it is well understood that most data available in an SNS business webpage is stored and owned by that SNS. Surely it provides quite extensive information of the online consumers engaged to the SNS business webpage of a business, and some SNSs such as *Facebook* even provide downloadable insights on the social interaction within the social business webpage which they host, but the business owner does not get to truly obtain the entire business data including its online consumers' profiles, and to integrate these data with the other components in its customer management system, like how he can by collecting and managing these data with a separate registration form, best done in his own e-commerce website. Moreover, consider the unknown risk of having the SNS to shut down and end its social networking service, all business data will then be lost altogether. Also, the privacy of users' data raises a greater concern when businesses rely on an external party such as SNSs to store their business data and customers details, as compared to having their own data management system and databases which are not sharing the same data storage in SNSs together with everyone else's data [14,19,23].

2) *Lack of Control over System Reliability*: Secondly, the system reliability of SNSs is beyond the control of the businesses. For instance, when the SNSs server is down, businesses may be faced with the risk of losing their critical sales online if their only web presence or 'online shop' is their social business webpage in SNSs. In case the SNSs decide to close down someday, it also means the 'online shop' of the businesses has to be closed down altogether. Worse cases like having other business rivals to hijack or buy over a social business webpage name directly from the SNSs without the initial owner's consent is even more frustrating, having all the engaged online consumers to be bought over altogether. This was the lost faced by a German drug maker, *Merck KGaA*, when *Facebook* admitted to have mistakenly made an administrative error and transferred the ownership of its *Facebook* business page to its rival, *Merck & Co* [18].

3) *Highly Possible Weakening of Brand Reputation*: Other than that, a business that builds its web presence

only in SNSs raises another concern of brand reputation and trustworthiness to online shoppers. It is tempting to think that a business that cannot afford or is not willing to invest for its own e-commerce website is not serious about doing real business, and thus it cannot be easily trusted. While on the other hand, when a business, which already has its own e-commerce website as its main web presence, sets up a social business webpage in SNSs as its additional web presence, such a trustworthy concern will not be significant.

Therefore, the problem here is: Businesses that build their web presence solely in SNSs can capitalize on the business benefits associated with SNSs, but at the cost of losing their business data ownership, lacking control over the system reliability of SNSs to keep their 'online shop' up running well all the time, as well as possibly weakening their brand reputation for not having their own websites. This project aims to provide an additional valuable guideline to new businesses which desire to go online in deciding whether to save the cost and take the business risk by building their web presence solely in SNSs business webpage, or to invest in building their own e-commerce website.

It is important to note that when a business has its own e-commerce website, all the major ownership-related issues due to not having its own website and only setting up a social business webpage in SNSs as mentioned earlier are no longer a concern, because now the business holds the ownership of its business data and website reliability, and builds a stronger brand reputation for itself by having its own e-commerce website.

C. Objective and Scope of Study

The objective of this project is to analyze the impact of integrating social elements from SNSs into e-commerce website interface on online consumer behaviour within the website. With *Facebook* being one of the most popular SNSs currently, its social presence elements such as the *Facebook Like Button* and *Comment Box* have been selected to be integrated into the website interface of *ToHerHeart.com* (pronounced as To Her Heart dot Com, *toherheart.com*), an e-commerce website selling gifts and services related to relationships. *ToHerHeart.com* has been greatly transformed from its former website under the previous study on its web usability by the author, and this study is the continuous effort following that study.

As mentioned in the previous section, the major ownership-related issues of building business web presence in only SNSs business webpage can be avoided by setting up own business website. However, there is a need to justify if businesses can still capitalize on the business benefits, which have been proven by earlier studies to be present inside SNSs, by integrating social elements from successful SNSs into the business website

interface. Thus, the scope of this project covers up to analyzing the impact of integrating social elements from *Facebook* into *ToHerHeart.com* website interface on online consumer behaviour.

II. LITERATURE REVIEW

A. Perceived Trust

In the year 2003, Riegelsberger, Sasse, & McCarthy conducted a study on whether the positive effect of increased trust by adding photos in advertisements would also result the same when applied in e-commerce website interface [21]. The study shows that carefully selected photos that are relevant to the web contents do help increase online consumers' trust for the e-commerce website generally, yet also depending on the nature of the websites [21]. What this means is that, although trust may be increased by adding relevant photos, this resulted trust is not always necessary or beneficial to all websites. For instance, greater trust is not really necessary for entertainment websites like 9GAG (9gag.com) in order to pull more readers and jokes contributors; the purpose of adding photos into this website is only to enhance readers' amusements and enjoyments.

In addition, Harris & Goode [9], Mantymaki & Salo [16], McCole, Ramsey, & Williams [17], and Weisberg, Te'eni, & Arman [26] also conducted studies which all concluded the importance of online consumers' trust in e-commerce websites for driving online purchasing intention. Social presence can be infused into e-commerce websites through the creative usage of socially-rich words and photos to create human warmth, and thus, trust, in the online environment [10,16].

In the context of trust created through *Facebook* social elements, when a *Facebook* user "Likes" or "Comments" on a product or content posted in an e-commerce website, this piece of information will appear on this user's *Facebook Wall*. When the *Facebook* friends of this user see the liked or shared information on his *Facebook Wall*, it will indirectly tell them that he trusts this particular e-commerce website who owns the information that he likes or shares. If his *Facebook* friends also "Like" or "Comment" on the business information he has "liked" or "commented" on, this will then indirectly tell how much his *Facebook* friends trust the contents he spread. The level of online consumers' perceived trust, which is strengthened by this chained trust effect, will be measured and analyzed in this project before and after integrating *Facebook* social elements such as the *Facebook Like Button* and *Comment Box* into *ToHerHeart.com* website interface.

1) *Analyzing the Online Consumers' Perceived Trust*: Therefore, the first hypothesis (H1) that this project will have to test states: Integrating the social

elements from *Facebook* into an e-commerce website interface increases the online consumers' perceived trust for the website and its contents.

B. Word-of-mouth (WOM) Effect

Later in April 2011, a study on the impact of SNSs to organizations and their employees shows that a significant majority - as high as 74% of the study participants - agreed that SNSs are capable to be their great 'weapons' to spread negative remarks about their organizations and harm the reputation of the organizations in case of employees' dissatisfaction towards their organizations [2]. This result strengthens the strong influence that exists among the social networking communities through word-of-mouth (WOM). Nevertheless, it also leads to the need to justify if businesses can still preserve this viral WOM influence of the social networking communities that strongly exists within *Facebook* by integrating its social elements into e-commerce websites.

Several studies conducted earlier also presented the greater WOM opportunity and impact that SNSs can better provide for businesses compared to traditional marketing strategies [6,7,14,25]. SNSs, especially *Facebook*, have been proven to have the capability of helping businesses reach more customers through their respective built-in applications for businesses [6,7] at a way much lower cost via the setting up of social business webpage in SNSs.

This WOM effect works similarly like the chained trust effect: a *Facebook* user spreads about a product or information of an e-commerce website, and his *Facebook* friends who "Like" or "Comment" on his post about this shared business product or information will continue to spread about it, and their next level of friends will help spread the information even further. This viral marketing effect of spreading the business product or information will eventually continue down to multiple levels of other *Facebook* users. Thus, the level of this WOM effect among the online consumers in *ToHerHeart.com* will be another variable to be measured and analyzed in this project, before and after the *Facebook* integration.

1) *Analyzing the WOM Effect among the Online Consumers*: Hence, the second hypothesis (H2) to be tested under this project states: Integrating the social elements from *Facebook* into an e-commerce website interface increases the online consumers' intention to share and spread about the posts, products, programs and promotional information from the website to their family and friends.

C. Purchase Intention

The study conducted by Jiang, Chan, Tan, & Chua [13] has concluded that active interaction, or social presence, in the e-commerce website promotes online

consumers' purchase intention, besides the other factors which also affect the purchase intention, including product price and consumers' time availability for further product survey [15].

Facebook has a very high interactivity among its users even at the rate of every second [24]. However, there is also a need to justify if this high user interactivity rate in *Facebook* can still be preserved in the e-commerce website after integrating its social elements into the website interface, to eventually promote online consumers' purchase intention in the website. Hence, this project *also measures and analyzes* the level of online consumers' purchase intention that is encouraged by the interaction between web visitors within *ToHerHeart.com* website, before and after the integration of *Facebook* social elements into *ToHerHeart.com* website interface.

1) *Analyzing the Online Consumers' Purchase Intention:* Thus, this project will also test the third hypothesis (H3): Integrating the social elements from *Facebook* into an e-commerce website interface increases the online consumers' intention to purchase products from and use the services offered by the website.

D. Critical Analysis of Literature

Many social presence-related studies conducted earlier have laid down an established foundation for this project by conveying the respective limitation in their studies as well as the opportunity to expand their studies for future research.

1) *Lack of Related Studies Done on Actual Websites:* Among the literatures reviewed for this project, a common limitation is presented: the laboratory website setting of the studies hindered the collection of actual or natural consumers' behaviour data, which by far can only be collected via real websites [5,10,11]. On top of that, most studies were conducted across websites selling limited variations of products sold or services [9,10,13]. This has led to the setting of this project scope to be conducted in an actually operating e-commerce website, *ToHerHeart.com*, which sells all kinds of gifts - handicrafts, necklaces and earrings, books, electronic gadgets, apparels, and more - as well as services like fellowship advice and celebration planning.

2) *Lack of Studies on Business Benefits of Facebook in other Websites:* In addition, many studies have been conducted to analyze and prove the business benefits that are associated with *Facebook* within the *Facebook* context in particular, but none has really studied on the beneficial business impact of *Facebook* social elements if they were to be integrated into e-commerce website interface. This area that lacks research is the reason that leads small-business start-ups to assume that setting up their 'online shop' inside SNSs like *Facebook* is the best option - easiest and cheapest - if

they decide to go online, without realizing the cost of the ownership-related issues mentioned earlier.

3) *New Social Elements yet to be Studied:* As of current, researchers have studied on the impact of integrating social presence into e-commerce website interfaces via the usage of socially-rich text descriptions and photos for the products or services sold online, as well as the inclusion of online chatting system and forum [5,10,11]. So it opens doors for new research to study on the impact of integrating other different social elements into the e-commerce website interface. To capitalize on the high popularity of SNSs nowadays, their social elements present yet a new area of study: to integrate user-familiar SNSs social elements into e-commerce website interface, instead of integrating standalone product comment boxes or content-sharing function. To optimize the outcome of social presence for the e-commerce website, *Facebook* has been selected due to its popularity and population size among all other SNSs [24]. This is also to capitalize on the greater level of familiarity that many online users today already have with *Facebook* elements to encourage more interaction within the website that uses the same *Facebook* social elements such as its *Like Button* and *Comment Box*.

E. Research Model

To better visualize the entire project, Fig. 2.1 below illustrates its research model.

III. METHODOLOGY

A. Rapid Application Development Methodology

This project embraces on the rapid application development (RAD) methodology as illustrated in Fig. 3.1 below. The entire project was outlined in detail during the planning stage, including the drafting of Gantt chart for each task.

1) *Analysis I - Surveys in Social Presence-related Paper:* Several social presence-related papers, including those by Chen et al. [4], Cyr et al. [5], Hassanein & Head [10], Hassanein & Head [11], Mantymaki & Salo [16], and Riegelsberger et al. [21], were being revisited to study on the established methods commonly used to measure the three variables on online consumers' behaviour - perceived trust, WOM effect, and purchase intention - intended to test the hypotheses of this project. Collecting survey data using the Likert Scale and then analyzing these data using statistical tests was the dominant process in these papers to study social presence

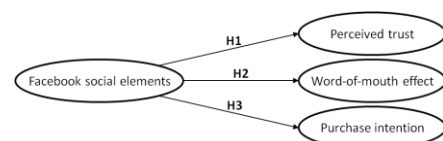


Figure 2.1. Research model and project hypothesis mapping.

in websites. Established survey questions that measure these three variables were extracted from these papers respectively to be adjusted and tailored to the online survey of this project research.

2) *Analysis II - Possible Facebook and Prestashop Integration:* As of this stage, *ToHerHeart.com* was built on *Prestashop* (www.prestashop.com), an open-source e-commerce software solution. The *Facebook* online tutorial documentations for developers were studied and additional online research was done to better understand the possible integration between *Prestashop* and *Facebook* platforms. As of this writing, there were already quite a lot of *Prestashop* e-commerce modules developed by *Prestashop* community which were integrating with *Facebook*, and were available to be customized to *ToHerHeart.com* website for the purpose of this study.

3) *Design I - the Research Online Survey:* The relevant established surveys from previously conducted studies were extracted and then adjusted for the research online survey of this project. It required the survey respondents to rate their level of agreement to each of the ten statements structured to measure the variables in the hypotheses of this project, using the five-point Likert Scale where a score of 1 denotes “Strongly disagree” and a score of 5 denotes “Strongly agree”.

The ten statements in both the online surveys were: (1) “I trust the information presented in *ToHerHeart.com*,” (2) “I feel the owner of *ToHerHeart.com* will provide me with good service,” (3) “I will share and introduce *ToHerHeart.com* to my family and friends,” (4) “I will share with my family and friends about the interesting products and services from *ToHerHeart.com*,” (5) “I will consider buying from *ToHerHeart.com* when I want to find gifts next time,” (6) “I will consider sharing my relationship struggles with the Fellowship Mentor at *ToHerHeart.com*,” (7) “I want to be notified when *ToHerHeart.com* launches new gifts, products and programs,” (8) “I have confidence in the owner's integrity and I will register as member at *ToHerHeart.com*,” (9) “I enjoy browsing or visiting *ToHerHeart.com*,” and (10) “I will browse or visit *ToHerHeart.com* again.”

Statements 1, 2, 7 and 8 measured the online consumers' perceived trust in *ToHerHeart.com* as stated in the project hypothesis 1 (H1), while statements 3 and 4 measured the WOM effect among the online consumers within *ToHerHeart.com* as stated in hypothesis 2 (H2), and statements 5 and 6 measured the online consumers' purchase intention in *ToHerHeart.com* as stated in hypothesis 3 (H3). Statements 9 and 10 were not directly measuring any of the variables in the project hypotheses, but they collected valuable insights to the online survey respondents' browsing experience with *ToHerHeart.com*.

This survey was crucial to measure all the three variables before and after the integration of *Facebook* social elements into *ToHerHeart.com* website interface in order to draw a comparison between the two and test the three project hypotheses.

4) *Design II - ToHerHeart.com Website and Facebook Integration:* The earlier analysis showed that it would take more effort to customize the existing *Prestashop* modules that integrate *Facebook* with *ToHerHeart.com* than to create new modules and code snippets instead. Therefore, one new module was designed to include the *Facebook Activity Feed* plug-in, a *Facebook Like Button* and a *Send Button* for *ToHerHeart.com* home page, and to be located on the right panel of *ToHerHeart.com* e-commerce website on every webpage. Other than that, code snippets consisting of a *Facebook Like Button*, a *Send Button*, and a *Comment Box* were designed to be embedded at the end of every webpage for new post or article in *ToHerHeart.com* in order to allow online visitors to interact with other online users on the contents of that particular post or article. The similar code snippets were designed to be included in every product webpage in *ToHerHeart.com* for the same interactivity purpose.

5) *Implementation - Developing Survey and Website Integration:* The research online survey was developed using a free *Google Docs* (docs.google.com) online form and was launched to collect online consumers' behaviour in *ToHerHeart.com* before the integration of *Facebook* social elements. A banner link to this pre-integration online survey was embedded in the home page of *ToHerHeart.com* e-commerce website. An email invitation to visit the finalized *ToHerHeart.com* e-commerce website and to participate in answering the survey was distributed to reach random students from different colleges and universities in Malaysia, as well as random working adults that can be reached through the extended network of the author. At the same time, there was a possibility that other web visitors who did not receive the email invitation might also voluntarily participate in answering the online survey as directed from the survey banner link on *ToHerHeart.com* e-commerce website home page interface.

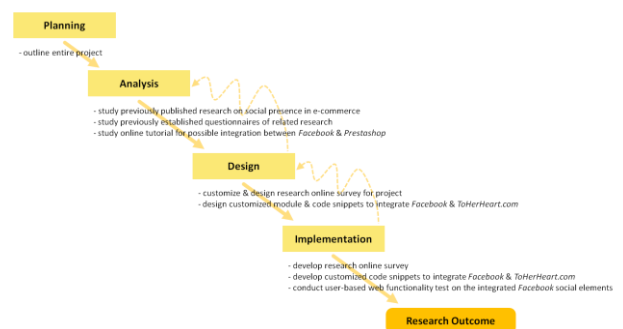


Figure 3.1. Rapid application development project methodology.

The customized new module and code snippets to integrate *Facebook* social elements into *ToHerHeart.com* website interface were then developed. Specific attention was also given to ensure that every link of *ToHerHeart.com* shared or posted in *Facebook* will produce the correct image thumbnail, link title and short description. A user-based web functionality test on the *Facebook* social elements inside *ToHerHeart.com* was conducted in order to test that each of the newly integrated *Facebook* social elements was functioning as expected, as well as to obtain additional feedback and comments from the test users regarding the new integration of *Facebook* social elements into *ToHerHeart.com* website interface. This web functionality test was conducted face-to-face and also via online with 15 random test users. For the face-to-face web functionality test, the five test users involved took turns to go through each of the instructions guided by a test moderator to use every integrated *Facebook* social elements in *ToHerHeart.com*. Whereas for the online web functionality test, it was conducted via live chat with 10 random online users guided by a test moderator on the other end of the chat through the same process as the face-to-face test, and the entire chat conversations were recorded in text form.

ToHerHeart.com was re-launched after the integration of *Facebook* social elements into its website interface, and the same research online survey was duplicated in a different *Google Docs* online form and distributed again to collect online consumers' behaviour after the *Facebook* social elements integration. This post-integration research online survey was distributed using the same method as the pre-integration survey. Part of the pre-integration survey respondents also participated in the post-integration survey.

6) *Analyzing and Concluding Research Outcome:* The survey respondents' score on the five-point Likert Scale for their level of agreement on each of the ten statements in both the online surveys were grouped together according to the respective hypothesis variable that the statements each intended to measure, and the mean scores for each hypothesis variable from both surveys were calculated and compared. To statistically validate the obtained survey result, a t-Test was conducted for the scores in each of the three variable data groups, using an online t-Test calculator provided by *GraphPad Software* (www.graphpad.com) - a 28-year-old data analysis, statistics and graphing company. The result and analysis of the t-Test from *GraphPad Software* were presented and discussion of the result was drawn. The t-Test is one of the methods commonly used in previous similar studies to know if the changes in the mean score for each of the hypothesis variables were statistically significant.

B. Tools Required

The tools required to conduct each major activity are: (1) for the research online survey development: established survey questions references from previous social presence-related studies (Cyr, Bonanni, & Ilsever, 2004, as cited in Ref. [5]; Cyr, Bonanni, Bowes, & Ilsever, 2005, as cited in Ref. [5]; van der Heijden, Verhagen, & Creemers, 2001, as cited in Ref. [11]; Gefen & Straub, 2003, as cited in Ref. [11]; Bhattacharjee, 2001, as cited in Ref. [16]), free online survey tools like *Google Docs* online forms and online survey respondents, (2) for *Facebook* integration code snippets development and customization: *Facebook* online tutorial documentations for web developers, *Prestashop* modules development online tutorials, and existing *Facebook*-related web modules, (3) for the user-based web functionality test on the function of the integrated *Facebook* social elements in *ToHerHeart.com* website interface: stable online chat system, test users and test moderator, and (4) for survey results analysis: the collected survey results and the online t-Test calculator from *GraphPad Software*.

C. Project Gantt Chart and Key Milestones

A project Gantt chart as shown in Fig. 3.2 below has been outlined to better visualize the progress timeline of the entire project which has been discussed in depth in the previous sections. The two key milestones of the entire project were the launching of both the pre-integration and post-integration research online surveys under the implementation stage - on the 1st and 18th of July 2012 respectively, in order for sufficient survey data to be collected for analysis, and the final research outcome to be eventually concluded and delivered.

IV. RESULT AND DISCUSSION

A. User-based Web Functionality Test Observation

From the user-based web functionality test that was conducted to test the newly integrated *Facebook* social elements in *ToHerHeart.com* website interface, all these social elements were functioning well as expected from the web users' end. However, there was an error with the *Facebook Send Button* in the integrated web module on *ToHerHeart.com* website home page from the administrator's end. This error was further investigated and was found to be a *Facebook* development bug on the administrator's end, but as of this writing there was no response to how this bug could be solved [12].

No	Project Stages	Apr	May	Jun	Jul	Aug
1	Planning					
2	Analysis					
3	Design					
4	Implementation					
5	Research Outcome					

Figure 3.2. Gantt chart of the entire project.

Nevertheless, this bug did not affect the functionality of the Facebook social elements at the web users' end and was thus not a priority concern to this project.

B. Survey Mean Score Simple Comparison Result

The mean scores for all the three variables measured in the project hypotheses, (H1) perceived trust, (H2) WOM effect, and (H3) purchase intention, were charted on the five-point Likert Scale, comparing the data collected from both the pre-integration and post-integration online surveys as shown in Fig. 4.1 below. According to the mean score comparison result, for H1 and H2, the mean scores increased slightly for both the online consumers' perceived trust of *ToHerHeart.com* and the WOM effect among them within *ToHerHeart.com* after the integration of *Facebook* social elements, but it remained in the same range between "Neutral" and "Agree". As for H3, the integration of *Facebook* social elements into *ToHerHeart.com* website interface has increased the mean score of online consumers' purchase intention relatively more than that of H1 and H2, but it still remained in the range between "Neutral" and "Agree".

C. Survey Data t-Test Result

Fig. 4.2 below shows the screenshot of the online t-Test calculator result by *GraphPad Software* for the data collected from both the pre-integration and post-integration research online surveys intended to measure H1 variable. The increase in online consumers' perceived trust in *ToHerHeart.com* from before to after the integration of *Facebook* social elements into the website interface was statistically not significant. In other words, this increase was likely to happen by chance. Under the "Review your data:" section, the sample size, *N*, was 160 for *Group One* because there were 40 survey responses collected from the first-batch online survey, and recall that there were four statements - statements 1, 2, 7 and 8 - in the survey that measured H1 variable. Thus, the scores for each of the four statements from these 40 respondents were grouped together and totalled to a sample size of 160 (= 40 responses x 4 statements) for H1 in the pre-integration survey. Similarly for *Group Two* sample size, *N*, there were 38 survey responses collected from the second-batch online survey, which totalled to a sample size of 152 (= 38 responses x 4 statements) for H1 in the post-integration survey.

Also from *GraphPad Software*, Fig. 4.3 below shows the screenshot of the online t-Test calculator result for the obtained scores from both online surveys intended to measure H2 variable. The increase in the WOM effect among the online consumers within *ToHerHeart.com* from before to after integrating *Facebook* social elements into the website interface was again considered statistically not significant, and that this increase was likely to occur by chance as well. The sample size, *N*, under the "Review your data:" section, was 80 for *Group*

One because there were only two statements - statements 3 and 4 - in the survey that measured H2 variable. Thus, the scores for each of the two statements from these 40 respondents were grouped together and totalled to a sample size of 80 (= 40 responses x 2 statements) for H2 in the pre-integration survey, and 76 (= 38 respondents x 2 statements) in the post-integration survey *Group Two*.

Following is Fig. 4.4 showing the screenshot of the online t-Test calculator result by *GraphPad Software* for the scores from both online surveys intended to measure H3 variable. The increase in online consumers' purchase intention in *ToHerHeart.com* from before to after the integration of *Facebook* social elements into the website interface was considered to be statistically significant, that this increase did not happen by chance. As there were also two statements - statements 5 and 6 - in the survey that measured H3 variable, the sample size, *N*, under the "Review your data:" section for *Group One* totalled to 80 (= 40 responses x 2 statements) for H3 in the pre-integration survey and for *Group Two* the post-integration survey, 76 (= 38 respondents x 2 statements).

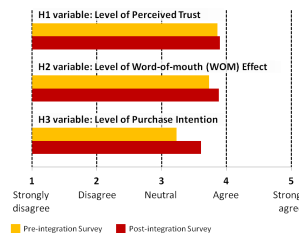


Figure 4.1. Mean score comparison result from both surveys.

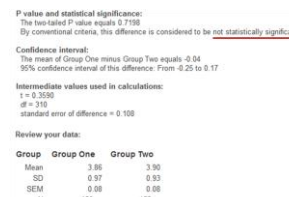


Figure 4.2. Screenshot of H1 online t-Test calculator result.

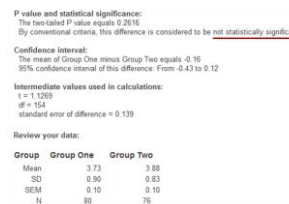


Figure 4.3. Screenshot of H2 online t-Test calculator result.

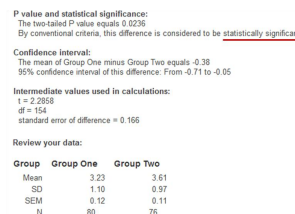


Figure 4.4. Screenshot of H3 online t-Test calculator result.

D. Discussion

The increase in the mean score of online consumers' purchase intention in *ToHerHeart.com* after integrating *Facebook* social elements into the website interface was considered statistically significant, but it still did not reach the "Agree" scale on the five-point Likert Scale. This could be caused by its initially low mean score during the pre-integration survey, which was very near to "Neutral," leaving a huge gap before it could reach "Agree" even after the integration *Facebook* social elements into *ToHerHeart.com* website interface. Unlike the mean scores of both the online consumers' perceived trust and WOM effect among them in the website, both mean scores were already near the "Agree" scale. However, the *Facebook* social elements integration did not bring significant impact to increase both variables to pass the "Agree" scale on the five-point Likert Scale.

Interestingly, the survey results suggested a value-chain pattern resulted from the synergized impact of integrating socially-rich photos and text contents, together with the highly interactive *Facebook* social elements into *ToHerHeart.com* website interface. In other words, integrating *Facebook* social elements alone into *ToHerHeart.com* website interface without other social elements, like the socially-rich photos and text contents, may not give the same level of positive impact to the three variables studied in this project - online consumers' perceived trust, WOM effect among them, and their purchase intention in *ToHerHeart.com*.

Following that, the high daily interactivity rate in SNSs like *Facebook* may also be a value-chain result of the synergized impact of interactively blending together SNSs communities' photos, their text-based contents, and all the social elements in the SNSs, such as *Facebook Like Button* and *Comment Box* in *Facebook*.

V. CONCLUSION AND RECOMMENDATIONS

A. Conclusion

From the results obtained, the integration of *Facebook* social elements have slightly increased the online consumers' perceived trust, WOM effect among them, and their purchase intention in *ToHerHeart.com* as a whole. However, the increased mean scores for all these three variables still remained in the range between "Neutral" and "Agree" on the five-point Likert Scale after integrating *Facebook* social elements into *ToHerHeart.com* website interface, although slightly moving towards "Agree." Thus, the three hypotheses of this project cannot be accepted. Although the increase in purchase intention was considered significant through the t-Test conducted for H3 variable, it cannot confidently support the hypothesis because the H3 variable mean score still did not achieve the minimal "Agree" scale on the five-point Likert Scale.

Other than that, businesses can improve the social presence in their e-commerce websites by putting together many different social elements including product images, socially-rich text descriptions, and SNSs

social elements to utilize the synergized impact these socially-rich combination could establish. On the other hand, the social impact on online consumers' behaviour may not be as strong when these social elements are individually integrated into the e-commerce website interface.

Furthermore, both building business web presence solely in SNSs and building business web presence in an e-commerce website each have their own advantages and disadvantages. Therefore, businesses can optimize the advantages from both options of building business web presence and minimize the disadvantages from both by first, building their own e-commerce websites, and at the same time setting up their business webpage in the SNSs to enhance social engagement with their online consumers.

B. Recommendations

Several interesting research topics can be expanded from where this study stopped. Firstly, since this study covered only the integration of social elements from *Facebook* into the e-commerce website interface, the integration of social elements from other SNSs, such as *Google Plus* (plus.google.com) and *LinkedIn* (www.linkedin.com) which each caters for slightly different groups of market respectively, can be a valuable research area to justify if there is different social impact on online consumers' behaviour by integrating social elements from different SNSs into the same e-commerce website interface.

Secondly, the impact of integrating *Facebook* social elements into the interface of a website that has no other social elements, like the socially-rich relevant photos or text descriptions, can be another valuable research topic to analyze the actual impact that can be contributed by the integration of *Facebook* social elements into e-commerce website interface alone, and at the same time justifying the existence of synergized social impact by blending all the different social elements together creatively in an e-commerce website interface.

Next, since this project studied on the impact of integrating *Facebook* social elements into the website interface of an e-commerce selling all kinds of products - *ToHerHeart.com*, this research can be conducted across different subjects of study - websites of different business natures each selling specialized products - to justify if the social impact resulted from the integration of *Facebook* social elements into the website interface of different business natures will still remain the same as with this project.

Last but not least, a new study can be done to verify the seriousness of the major ownership-related issues associated with businesses solely setting up business webpage in SNSs without having own business

website, as mentioned earlier in this paper. The outcome of this study will further equip new businesses if these major ownership-related issues are really critical to be avoided and that it is truly worthwhile for businesses to invest in an e-commerce websites regardless of whether or not the businesses have set up a business webpage in SNSs.

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