An Empirical Study of Text Messaging Behavioral Intention and Usage

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Abstract

Text messaging or Short Message Service (SMS) as a form of communication offers unique advantages to traditional phone call communications. The typical U.S. mobile subscriber sends and receives more SMS text messages than telephone calls. In an attempt to understand text messaging behavioral intention and encourage its adoption, this manuscript explores the text messaging behavior using the variables from the models of human behavior known as Theory of Reasoned Action (TRA), the Technology Acceptance Model (TAM), and the Diffusion of Innovation (DI). Variables from each did contribute to text messaging usage. In addition, an analysis of text messaging by age and student status was performed. Overall, there was no difference found in intent to use text messaging by age or gender. Also, no significant difference was found in frequency of text messaging and time spent texting by gender. Age, did show significant differences supporting statistics that show younger individuals text more. Linear regression found that four variables from the models affected text messaging behavior at $p < .10$, Usefulness and Ease of Use from TRA, Attitude from TAM, and Compatibility from Diffusion of Innovation. No other variable significantly affected behavioral intention at $p < .10$. This suggests that traditional variables influence text messaging use and its use can be expanded through education on its usefulness, simple training, integration and compatibility instruction, and a positive approach to its use.

Keywords: Theory of Reasoned Action, TRA, Technology Acceptance Model, TAM, Diffusion of Innovation, DI, Text Messaging, SMS

1. INTRODUCTION

In an attempt to understand text messaging behavioral intention and encourage its adoption, this manuscript explores text messaging behavior using variables from three models on human behavior: Theory of Reasoned Action (TRA); Technology Acceptance Model (TAM); and Diffusion of Innovation (DI). The authors explored variables from each of these models for their effect on text messaging usage.

This study explored text messaging behavior using variables from the Rogers (1995) model of human behavior known as Diffusion of Innovation (DI). According to Rogers (1995) important characteristics of an innovation include:

- Relative Advantage (RA)--the degree to which it is perceived to be better than what it supersedes
- Compatibility (COMP)--consistency with existing values, past experiences and needs
- Complexity (CMPX)--difficulty of understanding and use
- Trialability (TRY)--the degree to which it can be experimented with on a limited basis
- Observability (VI)--the visibility of its results

These factors influence intention to use a new technology and its diffusion into societal behavior. Rogers' (1995) diffusion of innovation theory uses these factors as a basis for modeling intention and subsequent behavior. Our study first reviews existing literature on both text messaging and Diffusion of Innovation and then applies Rogers' variables to understand and predict text messaging intention and behavior.

The Theory of Reasoned Action (TRA) model was developed by Ajzen and Fishbein (1980). The model uses three factors, attitude, subjective norm, intention, and behavior. TRA remains an important model for measuring user behavior (Wu & Liu, 2007; Wooley & Eining, 2006; Song & Kim, 2006; Pak, 2000; Lee, Tsai, & Jih; Brewer, Blake, Rankin, & Douglas, 1999).

The Technology Acceptance Model (TAM) includes two key factors, perceived usefulness and perceived ease of use that are proposed to influence acceptance of a technology. According to Davis (1989), perceived usefulness is defined as "the degree to which a person believes that using a particular system would enhance his or her job performance". Perceived ease of use is "the degree to which a person believes that using a particular system would be free of effort" (Davis, 1989).

2. LITERATURE REVIEW

Text Messaging

Text messaging is one of the fastest growing communications mediums in the United States. In June of 2008, 75 billion text messages were sent in the U.S. alone (Steinhauer & Holson, 2008). In late 2007, the number of text messages had surpassed the number of phone calls and this differential has continued to increase. During the second quarter of 2008, the average U.S. mobile user placed or received 204 phone calls each month. In comparison, the average mobile user sent or received 357 text messages per month. (Nielson News, 2008) It is being used by business and in the political arena. The most notable text message was used by President-Elect Barack Obama's to announce his Vice President selection to 2.9 million mobile users. Text messaging services, such as *kgb,* were flooded with inquiries upon the news of the Michael Jackson's death (Wortham, 2009).

Some of the advantages of text messaging are:

- Text Messaging is silent communication, so it is more discreet than a phone conversation.
- It is often less time-consuming to send a text message than to make a phone call or send an e-mail.
- Text messages can be used to send a message to a large number of people at a time.
- A text messaging subscription services can be used to get medication reminders sent to your phone, along with weather alerts, news headlines. (Hord, 2005)

The technology behind text messaging is SMS (short message service). SMS is used

to send and receive messages to and from cellular phones. SMS is a store-and-forward service; a text message does not go directly to the recipient's cell phone. The message is stored in the SMS carrier until the recipient's cell phone is on or moves into range, at which point the message is delivered. The message will remain stored on the recipient's SIM card until it is deleted. (Hord, 2005)

Text messaging is used most often by young teens. A study done by Nielson found that the average number of monthly texts sent by teens from the age of 13 to 17 was 1742. Whereas, the average number of texts for adults between the ages of 18 and 24 was only 790 texts; the usage was even less for older adults (Nielson News, 2008).

According to Bentz (2009), 82% of adults 18-24 are avid text message users. Of the 25-49 age group, 72% use text messages. However, 53% of those who send and receive text messages are 35-years-old and up.

Previous research has found gender differences in computer-mediated communication. For example, females use PC e-mail to communicate about private matters more than males (Kraut, Patterson, Lundmark, Kiesler, Mukophadhyay, & Scherlis, 1998; Project, Pew Internet and American Life, 2005) Igarashi et al. studied Japanese Freshman and looked at the gender differences in communication via text messaging (Igarashi, Jiro, & Toshikazu, 2005) . They determined that the volume of text messaging did not vary by gender. However the social relationship network maintained by text messaging was different. At later stages of text messaging females tended to form a large group comparable to face to face communication. In addition, Pruthikrai found that gender had no significant effect on text-messaging activity (Pruthikrai, 2007).

In a study conducted by Baron & Ling (2007), reasons for sending text messages varied considerably across genders. They studied a group of male and female students from a mid-sized university and another group of female students at a large university (group two). The most prevalent motivations to use text messaging were to arrange a meeting and to share news. They found that using text messaging to share news varied among the three groups in their study: it was very important for females in the first group, but not important to the males. Females in the second group fell somewhere in between. In judging reasons for making voice calls, females in group one also ranked "sharing news" more highly than the males or females in the second group. For all groups, using texting to "kill time" or "keep in touch" was found to be "reasonably important."

The major reason for deciding to text was that it was not a good time for the person initiating the communication to talk (e.g., he or she was in class or a noisy place). Ranking third was that it was not a good time for the receiver of the message to communicate (e.g., in class, asleep). In second place was "I want to make my message short, and talking takes too long" (Baron & Ling, 2007).

In a study of Greek university students done by Economides & Grousopoulou (2008), they found that there was "not a statistically significant relationship between genders" and the way they use their mobile devices.

Diffusion

Diffusion of Innovation theory is a theory of communication and adoption of new ideas and technologies. There are numerous studies on IS implementation using innovation diffusion theory in the IS literature, three are widely cited: Rogers (1995); Kwon & Zmud (1987); and Tornatzky & Fleischer (1990). Rogers' model has been frequently cited and is well established in the diffusion theory literature. Rogers defines innovation as "an idea, practice, or object that is perceived as new by an individual or other unit of adoption." (Rogers, 1995). He defines diffusion as "the process by which an innovation is communicated through certain channels over time and among the members of a social system." In other words, the diffusion of innovation evaluates how, why, and at what rate new ideas and technology are communicated and adopted.

Rogers identified five factors that strongly influence whether or not someone will adopt an innovation. These factors are: relative advantage, complexity, compatibility, trialability and observability. The relative advan-

tage is the degree to which the adopter perceives the innovation to represent an improvement in either efficiency or effectiveness in comparison to existing methods. The majority of studies have found that the relative advantage is significant (Teo & Tan, 2000; Premkumar & Ramamurthy, 1995). Ilie, et al found that relative advantage was significant for men, but not for women (Ilie, Van Slyke, Green, & Lou, 2005).

The complexity is the degree to which the innovation is difficult to understand or apply. The compatibility refers to the degree to which an innovation is perceived as being consistent with the existing values, past experiences, and needs of potential adopters. Premkumar and Ramamurthy (1995) found that the greater the complexity the slower the rate of adoption (Premkumar & Ramamurthy, 1995). Ilie, et al (2005) found when referring to instant messaging women placed more importance on the ease of use than did men.

Trialability refers to the capacity to experiment with the new technology before adoption. Observability or visibility refers to the ease and relative advantage with which the technology can be seen, imagined, or described to the potential adopter. Ilie, et al (2005) found another variable, critical mass, to be the most significant predictor for the use of instant messaging.

According to Rogers most innovations diffuse over time in the shape of a cumulative S-shaped curve(Rogers, 1995). Critical mass occurs, when enough individuals have adopted the innovation and its further rate of adoption becomes self-sustaining. Essentially, the diffusion process for all innovations consists of individuals talking to one another about the new idea, thus decreasing the perceived uncertainty of the innovation.

Rogers identified four main elements that affected the adoption of innovation: (1) the innovation, (2) communication channels, (3) time, and (4) the social system. The innovation is the new product or service. The communication channel is the means by which messages are transmitted from one individual to another. Time refers to the amount of time it takes to adopt the new innovation. The social system is the set of interrelated units that are devoted to joint problem-solving, to accomplish a common goal (Rogers, 1995).

Theory of Reasoned Action

In order to explore influences on text messaging behavior, a common model was selected Theory of Reasoned Action developed by Ajzen and Fishbein (1980) . The model uses three factors, attitude, subjective norm, intention, and behavior. TRA remains an important model for measuring user behavior (Wu & Liu, 2007; Wooley & Eining, 2006; Song & Kim, 2006; Pak, 2000; Lee, Tsai, & Jih; Brewer, Blake, Rankin, & Douglas, 1999). The model is shown in Appendix 1.

TRA was selected because TRA has shown successful application to general consumer information technologies (Hansen, Jensen, & Solgaard, 2004; Kwon & Zmud, 1987) and organizational knowledge sharing (Kwon & Zmud, 1987) In addition, "Hsu and Lu found one important TAM construct -- perceived usefulness -- did not directly affect behavioral intention, while the two TRA constructs -- attitude and subjective norms – did." (Wu & Liu, 2007) Intention to use is a common behavioral factor (Bahmanziari, Pearson, & Crosby, 2003; Lu, Yu, & Liu, 2005). Actual behavior generally follows intention in a variety of models (Riemenschneider & Hargrove, 2001; Bahmanziari, Pearson, & Crosby, 2003).

Definitions of the models factors are as follow:

- Attitude is how we feel about the behavior and is generally measured as a favorable or unfavorable mindset.
- Subjective norm is defined as how the behavior is viewed by our social circle or those who influence our decisions.
- Intention is defined as the propensity or intention to engage in the behavior.
- Behavior is the actual behavior itself.

Technology Acceptance Model

One of the most important models for understanding adoption of information technology is the Technology Acceptance Model

(TAM). The model was first proposed by Davis in 1989 and includes two key factors, perceived usefulness and perceived ease of use that are proposed to influence acceptance of a technology. According to Davis (1989) perceived usefulness is defined as "the degree to which a person believes that using a particular system would enhance his or her job performance". Others have extended this definition to include overall task performance (Simon & Paper, 2007)

Again according to Davis (1989) perceived ease of use is "the degree to which a person believes that using a particular system would be free of effort". Hong et al found that perceived ease of use was the most important driving force in forming a positive attitude toward continued usage of mobile data services. (Hong, Thong, Moon, & Tam, 2008).

This is generally how easy the system or technology is to use. In an initial model, Davis, Bagozzi, and Warshaw (1989) suggested external variables as a key influencing variable but later Venkatesh and Davis have suggested that external variables are mediated by TAM and have not been included in our model. The original Technology Acceptance Model is illustrated in Appendix 2 (Venkatesh & Davis, 1996). As noted, our model was used without the external variables.

3. METHODOLOGY

A survey was developed that included key questions used in development of past studies of TRA, TAM, and DI. Table 1 shows the questions that were used in this study. The study was pre-tested with a small group of students and then administered to students and faculty at two Northeastern universities and professionals in industry. The questions relevant to our study are shown in Table 1.

Table 1

I intend to use text messaging
I find Text messaging useful.
It is easy to become skilled Text messaging.
Text messaging is good.
Most people who are important to me think I should use Text messaging.
Many people I know use Text messaging.
Text messaging is frustrating.
Text messaging is compatible with how I communicate.
Text messaging improves my performance.
I have seen many people Text messaging.
It is easy to try Text messaging.

Demographics

The statistical analyses were based on a sample of 153 valid surveys. Of the surveys collected 42% were from males and 58% were from females. Overall, the average age was about 33 but the largest group was the 18-24 year old students. There was a large portion of the sample (45%) over 24. There were 89 female participants and 63 male participants. Gender mix was good with 58% female and 42% male. The graph in Appendix 3 shows the age distribution. 55% of the respondents were students and 45% were not.

Another demographic question examine the current professional status of the respondent, whether they were a student, a faculty member, and IT professional or from the private sector. 86(57%) of the respondents were students, 11(7%) faculty, 11(7%) IT professionals, and 43(29%) were from others. In general, it is suggested that the sample has a reasonable mix of gender, age, and professional status.

4. HYPOTHESES

In trying to understand text messaging behavior, a series of hypotheses were proposed. First was the issue of whether the use of text messaging at all was influenced by demographic factors. The first three hypotheses measure whether there was use of text messaging by gender, age, and by professional status.

Hypothesis one: There is no significant difference in whether text messaging is used by gender.

Hypothesis two: There is no significant difference in whether text messaging is used by age

Hypothesis three: There is no significant difference whether text messaging is used by student/faculty/professional/other category.

The next four hypotheses explore the extent of usage by respondents both in terms of frequency and in time spent. Variations are explored based on age and gender.

Hypothesis four: There is no significant difference in frequency of text messaging use by gender.

Hypothesis five: There is no significant difference in time spent text messaging use by gender.

Hypothesis six: There is no significant difference in frequency of text messaging use by age.

Hypothesis seven: There is no significant difference in time spent text messaging use by age.

Finally, the models of technology adoption variables were reviewed to see if they had significant influences on intention to use text messaging and actual use.

Hypothesis eight: There are significant variables that affect intention to use of text messaging.

Hypothesis nine: There is a significant relationship between text messaging intention and usage.

5. RESULTS

The results of the survey are presented in the following tables. All questions were measured on a 7 point Likert scale ranging from 1 = strong disagree to 7 strongly agree. Thus, the higher the number, the higher the level of agreement with the statement.

Hypothesis one: There is no significant difference in whether text messaging is used by gender.

Appendix 4 shows a higher agreement with the statement "I currently use text messaging" by males over females, though both are above 5, somewhat agree. An independent samples t test was performed to determine the significance of this difference. The two tailed significance as shown in Appendix 5 was .727 which does not allow us to reject the null hypothesis that there is no significant difference between males and females on whether they use text messaging. The research hypothesis one that there is no significant difference is supported. Gender does not play a role in whether text messaging is used.

Hypothesis two: There is no significant difference in whether text messaging is used by age

Appendix 6 shows that all age groups had a mean agreement over neutral, though generally it appears that younger groups had a somewhat higher level of agreement. Testing this difference via one way ANOVA finds that there is no significant difference over the age groups. Hypothesis two was supported. No difference in whether TM was used was found based on age

Hypothesis three: There is no significant difference whether text messaging is used by student/faculty/professional/other category.

The final analysis of whether text messaging was the same across demographic categories was for professional status, namely student, faculty/staff, IT Professional, or other. All were above neutral in level of agreement but with some differences (Appendix 8). Appendix 9 ANOVA shows these differences to not be significant. Hypothesis three is supported

Hypothesis four: There is no significant difference in frequency of text messaging use by gender.

Hypothesis five: There is no significant difference in time spent text messaging use by gender.

In order to analyze hypotheses four through seven, two additional questions were explored.

The survey asked the respondents to select the closest estimate of how often they use Text Messaging. The options were: never, once a month, once a week, several times a week, many days of the week, daily, many times a day. The survey also asked for the respondents to select the closest estimate of how much time you spend on Text messaging each month. The options were: 0-5 minutes, 30 minutes, 60 minutes, 3 hours, 10 hours, or more than 10 hours.

The results by gender are presented in Appendix 10. Women responded that on average they approximately text daily, whereas on average men indicate that they text many days a week. This difference was not found to be significant at p <.10 as shown in Appendix 11 (p is actually .177). Hypothesis four was supported. Hypothesis four: There is no significant difference in frequency of text messaging use by gender. The literature also supports our results. (Pruthikrai, 2007)

Similarly, though a small difference was found in the amount of time averaged (4 to 6 hours per month). This difference also was not significant at p < .10. Hypothesis five was supported. Hypothesis five: There is no significant difference in time spent text messaging use by gender.

Both Hypotheses 4 and 5 are supported.

Hypothesis six: There is no significant difference in frequency of text messaging use by age.

Hypothesis seven: There is no significant difference in time spent text messaging use by age.

Age group analysis however provided different results. As shown in Appendix 12 and 13, in both frequency of use and total time spent per month, age played a significant role. Younger age groups both texted more frequently and for longer periods of time. These results were significant at p < .01. Younger age groups texted several times a day and older groups texted several times a week. Younger age groups texted between 3 and 10 hours a month, whereas older groups texted between 30 and 60 minutes. Previous literature supports these findings (Nielson News, 2008)

Hypotheses six and seven were not supported. There was significant difference in frequency and time spent text messaging by age. Age did play a significant role in frequency of usage as well total time spent. Generally, younger individuals spent more time text messaging and texted more often than older individuals.

Hypothesis eight: There are significant variables that affect intention to use of text messaging.

The last area explored was the variables influencing text messaging. As noted, variables from three commonly used technology adoption models were used in the survey. The questions and the model from which they originated are shown in Appendix 14.

All the variables in the three models were entered into a multiple regression analysis as independent variables, with intention to use text messaging as the dependent variable. Intention was used since this is the dependent variable used in both TAM and TRA. Hypothesis nine deals with the relationship between intention and use.

Overall, the regression analysis achieved a coefficient of determination of .856, suggesting 86% of the variation in behavioral intention can be attributed to the significant variables. (Appendix 15)

The variables that were found to be significant were only four of the ten, namely Usefulness at p < .01, Ease of use at p < .01, Compatibility at p < .05, and Attitude at p < .10. All the factors and their significance are shown in Appendix 16.

Appendix 17 confirms the absence of collinearity in the analysis, thus verifying the significant variables. The strongest influence on text messaging intention was usefulness, followed by ease of use, attitude, and then compatibility. These variables can be used in a training program to enhance the use of text messaging as an important communications tool.

Hypothesis eight was supported.

Hypothesis nine: There is a significant relationship between text messaging intention and usage.

Finally, as in TRA and TAM models it was shown that intention to use text messaging is a strong and significant factor in use of text messaging. Hypothesis nine was supported.

6. IMPLICATIONS AND DISCUSSION

Overall it has been demonstrated that variables from the Technology Acceptance Model, Theory of Reasoned Action, and Diffusion of Innovation can serve as a model for text messaging behavior. Research has shown that text messaging has become an

important means of communication surpassing telephone calls. But, this new form of communication has been lightly studied. Understanding the variables associated with intention and behavior associated with text messaging can focus efforts to understand and improve text messaging usage.

First, it was shown that intention to use text messaging was unaffected by either gender, age or student/work status. This suggests that programs to adopt text messaging do not need to favor gender, age, or different work groups. Though further study may reveal different purposes and needs, the proportional use of the technology is not affected by gender or student/work status.

The second finding is that time spent using text messaging and the frequency of text messaging is significantly and inversely associated with age. Further study needs to be undertaken to determine the reasons behind this discrepancy. The question is whether the difference is due to lack of time, lack of purpose, or lack of understanding. Depending on this answer, specific recommendations can be developed. New releases of text messaging hardware and software have made the technology extremely easy to use and perhaps features need to be demonstrated to older individuals. This can spur growth and use of the technology.

Another major finding was that there were significant variables that did affect text messaging usage. These variables were Usefulness, Ease of Use, Compatibility, and Attitude.

The study also clearly demonstrated as well that intention to use text messaging does lead to actual use of text messaging. Thus, all efforts to influence intention will have the desired effect of increasing actual usage.

7. CONCLUSION

In general, this study has provided significant variables that influence and model text messaging intention and behavior. This suggests that traditional variables influence text messaging use and its use can be expanded through education on its usefulness, simple training, integration and compatibility instruction, and a positive approach to its use. We see this as the start of an exploration of ways to increase and improve penetration of this valuable communications technology. Studies can be developed to confirm these findings with larger and more diverse sample groups, but preliminary findings suggest that text messaging does have significant variables that influence intention. In addition, little variance has been found by gender or work status. There has been a significant difference however due to age in volume of usage. Knowing this, specific programs and education can be developed to use the significant variables as a model to develop programs to increase text messaging usage among older individuals. Overall, this is a fertile research area that deserves further attention.

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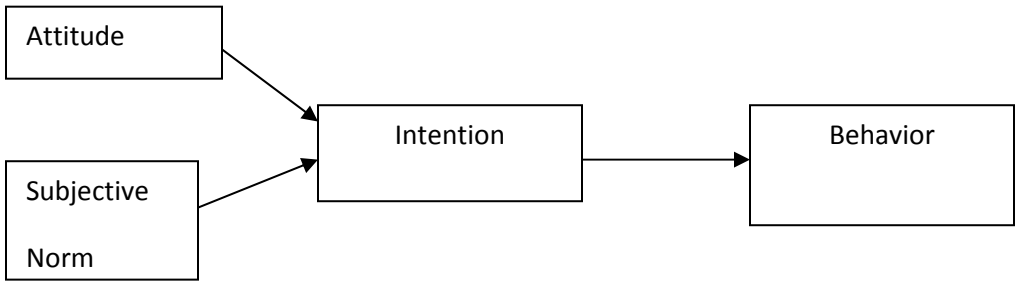
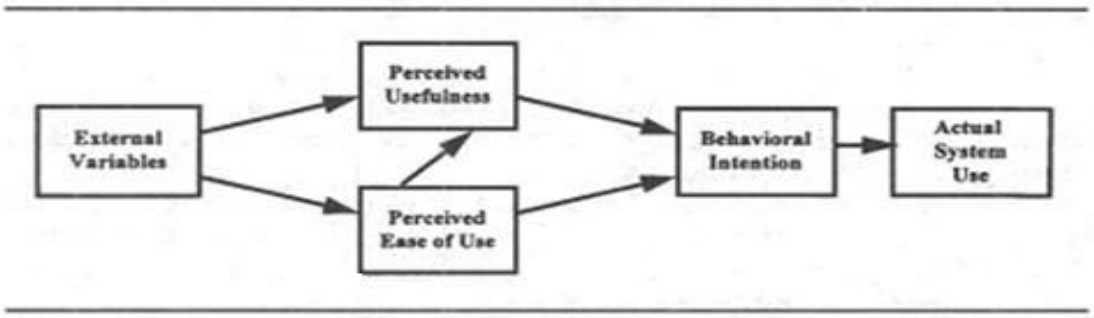
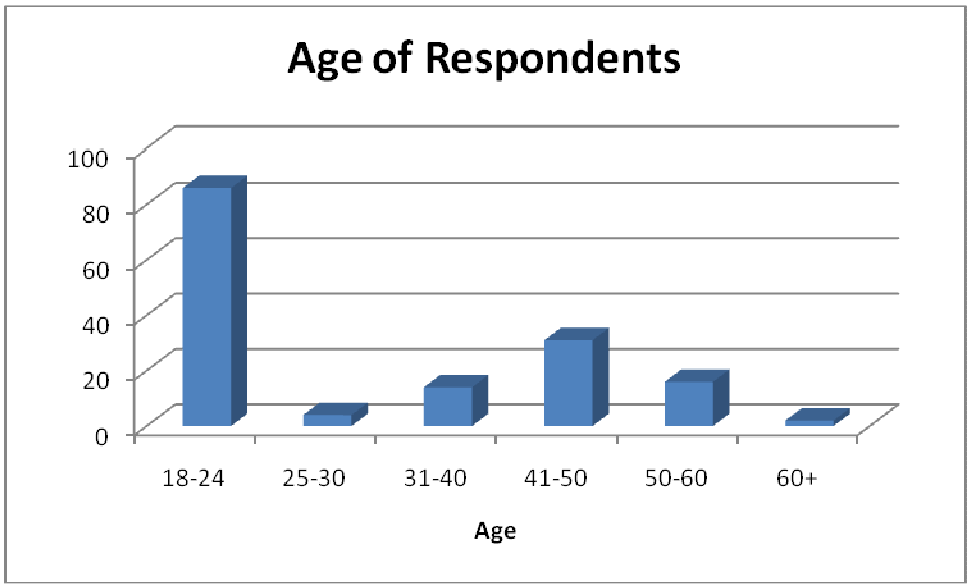
Appendix 1. Theory of Reasoned Action



Appendix 2. Technology Acceptance Model



Appendix 3. Age Distribution of Respondents



Appendix 4. Use of Text messaging by Gender

	Gender	N	Mean	Std. Dev	Std. Err. Mean
I currently use Text messaging.	Female	73	5.08	2.521	.295
	Male	51	5.24	2.214	.310

Appendix 5. Frequency of Text Messaging by Gender

	Gender	N	Mean	Std. Dev.	Std. Error Mean
howoften	Female	73	5.71	1.982	.232
	Male	52	5.19	2.197	.305
time	Female	73	3.48	1.617	.189
	Male	52	3.27	1.750	.243

Appendix 6 Text Messaging use by Age

I currently use Text messaging.

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
1	71	5.13	2.535	.301	4.53	5.73	1	7
2	3	7.00	.000	.000	7.00	7.00	7	7
3	11	5.55	1.916	.578	4.26	6.83	2	7
4	27	4.89	2.455	.472	3.92	5.86	1	7
5	11	4.91	2.119	.639	3.49	6.33	1	7
6	1	6.00	.	.	.	.	6	6
Total	124	5.15	2.391	.215	4.72	5.57	1	7

Appendix 7 ANOVA Usage and Age

I currently use Text messaging.

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	15.225	5	3.045	.522	.759
Within Groups	688.162	118	5.832		
Total	703.387	123			

Appendix 8. Age Use Descriptive

I currently use Text messaging.

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
1	72	5.14	2.519	.297	4.55	5.73	1	7
2	9	4.67	2.784	.928	2.53	6.81	1	7
3	9	5.56	1.878	.626	4.11	7.00	2	7
4	33	5.12	2.205	.384	4.34	5.90	1	7
Total	123	5.13	2.395	.216	4.70	5.56	1	7

Appendix 9 Age Use ANOVA

I currently use Text messaging.

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	3.570	3	1.190	.203	.894
Within Groups	696.348	119	5.852		
Total	699.919	122			

Appendix 10. Frequency and Time Gender Group Statistics

Gender	N	Mean	Std. Deviation	Std. Error Mean

howoften	female	73	5.71	1.982	.232
	male	52	5.19	2.197	.305
time	female	73	3.48	1.617	.189
	male	52	3.27	1.750	.243

Appendix 11. Frequency and Time Gender Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
howoften	Equal variances assumed	1.564	.213	1.382	123	.170	.520	.376	-.225	1.265
	Equal variances not assumed			1.358	102.829	.177	.520	.383	-.239	1.279
time	Equal variances assumed	.698	.405	.692	123	.490	.210	.304	-.391	.811
	Equal variances not assumed			.683	104.498	.496	.210	.308	-.400	.821

Appendix 12 Frequency and Time Age Descriptives

	N	Mean	Std. Dev.	Std. Error	95% Confidence Interval for Mean	Min	Max

How Often					Lower Bound	Upper Bound		
Never	71	6.52	1.094	.130	6.26	6.78	1	7
Once a Month	0	0.00	0.00	0.00	0.00	0.00	0	0
Once a Week	3	7.00	.000	.000	7.00	7.00	7	7
Several times a Week	11	4.45	2.067	.623	3.07	5.84	1	7
Many Days a Week	28	3.93	2.581	.488	2.93	4.93	1	7
Daily	11	3.64	1.690	.509	2.50	4.77	1	6
Many times a Day	1	4.00	.	.	.	.	4	4
Total	125	5.50	2.082	.186	5.13	5.86	1	7
Amount of time								
0 – 5 minutes	71	4.24	1.378	.164	3.91	4.57	1	6
30 minutes	3	4.67	.577	.333	3.23	6.10	4	5
60 minutes	11	2.18	1.079	.325	1.46	2.91	1	4
3 hours	28	2.14	1.407	.266	1.60	2.69	1	6
10 hours	11	2.09	1.044	.315	1.39	2.79	1	4
More than ten hours	1	2.00	.	.	.	.	2	2
Total	125	3.39	1.670	.149	3.10	3.69	1	6

Appendix 13 Frequency and Time Age ANOVA

		Sum of Squares	df	Mean Square	F	Sig.
howoften	Between Groups	202.400	5	40.480	14.386	.000
	Within Groups	334.848	119	2.814		
	Total	537.248	124			
time	Between Groups	136.222	5	27.244	15.470	.000
	Within Groups	209.570	119	1.761		
	Total	345.792	124			

Appendix 14 Survey Model Questions

Model	TRA, TAM, DI	Sig.
I find Text messaging useful. (Usefulness)	Technology Acceptance Model (TAM)	.280
It is easy to become skilled Text messaging. (Ease of use)	Technology Acceptance Model (TAM)	.000
Text messaging is good. (Attitude)	Theory of Reasoned Action(TRA)	.008
Most people who are important to me think I should use Text messaging. (Subjective Norm)	Theory of Reasoned Action(TRA)	.091
Many people I know use Text messaging. (Critical Mass)	Diffusion Theory(DI)	.168
Text messaging is frustrating. (Complexity)	Diffusion Theory(DI)	.714
Text messaging is compatible with how I communicate. (Compatibility)	Diffusion Theory(DI)	.916
Text messaging improves my performance. (Relative advantage)	Diffusion Theory(DI)	.041
I have seen many people Text messaging. (Visibility)	Diffusion Theory(DI)	.120
It is easy to try Text messaging. (Trialability)	Diffusion Theory(DI)	.527

Appendix 15 Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.925[a]	.856	.841	.812

Appendix 15 Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.925[a]	.856	.841	.812

a. Predictors: (Constant), It is easy to try Text messaging., Text messaging is frustrating., Text messaging is compatible with how I communicate., Most people who are important to me think I should use Text messaging., Text messaging improves my performance., Many people I know use Text messaging., Text messaging is good., I find Text messaging useful., It is easy to become skilled Text messaging., I have seen many people Text messaging.

Appendix 16. TAM, TRA, and DI Variable Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-.467	.430		-1.087	.280
	I find Text messaging useful.	.473	.092	.447	5.138	.000
	It is easy to become skilled Text messaging.	.273	.101	.224	2.699	.008
	Text messaging is good.	.142	.083	.133	1.704	.091
	Most people who are important to me think I should use Text messaging.	.085	.062	.071	1.388	.168
	Many people I know use Text messaging.	.029	.080	.030	.367	.714
	Text messaging is frustrating.	.006	.058	.005	.106	.916

Text messaging is compatible with how I communicate.	.119	.058	.103	2.071	.041
Text messaging improves my performance.	-.099	.063	-.078	-1.567	.120
I have seen many people Text messaging.	.063	.100	.061	.635	.527
It is easy to try Text messaging.	.061	.089	.052	.682	.497

a. Dependent Variable: I intend to use Text messaging.

Appendix 17. Collinearity Diagnostics[a]

				Variance Proportions										
Model	Dimension	Eigenvalue	Condition Index	(Constant)	I find Text messaging useful.	It is easy to become skilled Text messaging.	Text messaging is good.	Most people who are important to me think I should use Text messaging.	Many people I know use Text messaging.	Text messaging is frustrating.	Text messaging is compatible with how I communicate.	Text messaging improves my performance.	I have seen many people Text messaging.	It is easy to try Text messaging.
1	1	10.219	1.000	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
	2	.322	5.631	.01	.00	.00	.00	.00	.00	.33	.00	.00	.00	.00

3	.158	8.042	.01	.00	.00	.00	.04	.03	.00	.07	.14	.01	.01
4	.095	10.399	.00	.00	.00	.00	.37	.00	.00	.36	.00	.00	.00
5	.061	12.962	.02	.03	.01	.00	.21	.00	.01	.25	.42	.00	.02
6	.052	14.029	.06	.01	.03	.18	.01	.10	.02	.01	.08	.01	.08
7	.026	19.996	.63	.12	.02	.07	.04	.03	.41	.00	.25	.03	.00
8	.021	22.026	.08	.05	.15	.37	.01	.27	.11	.00	.05	.09	.11
9	.021	22.120	.17	.45	.01	.16	.30	.15	.00	.27	.00	.00	.08
10	.015	25.991	.03	.02	.70	.01	.01	.00	.02	.00	.02	.00	.66
11	.010	31.291	.00	.32	.08	.20	.01	.41	.08	.03	.03	.85	.03

a. Dependent Variable: I intend to use Text messaging.