

A Hybrid Technology Acceptance Approach for Using the E-CRM Information System in Clothing Industry

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Abstract

A successful E-CRM strategy and implementation should be able to demonstrate a shift in the number of interactions from higher cost channels to lower cost electronic channels. Combining this with the ability to demonstrate either sustained or improved relationship strength levels will provide a good overall indicator of the value of a company's E-CRM activities. Highly effective E-CRM comes when companies accurately allocate resources to those areas where they can have the highest impact. The technology acceptance model (TAM) is particularly useful for explaining and analyzing Information System-usage behavior and subsequently, the behavior is influenced by attitude and behavioral intention.

Therefore, this study integrates TAM with an extension of innovation diffusion theory (IDT), IS innovation model, in a complimentary manner and, furthermore, empirically concludes some guidelines for practitioners to effectively assist in the diffusion of E-CRM in Clothing Industry .Based on 85 questionnaires collect from 15 clothing companies in Iran, the research finds that studies strongly support this hybrid technology acceptance approach Using the E-CRM Information System.

Keyword: E-CRM, TAM, IDT, Information System.

Introduction

Internet increasingly becomes a channel of conducting business and gathering information, users are likely to suffer from information overload. Consider a situation where a customer enters an online shopping store and does not find the required product because of the complexity of the site. By the virtue of the competitor being just-a-click away, there is a high chance of him/her defecting. Just like an offline store would have sales-representatives guiding the user, similar help would be needed in the on-line model in order to retain customers. One of the goals of E-CRM is providing value-added services to customers like price-comparisons and detailed product information depending on the customer requirements.

Much research has been done on such topics as E-CRM management (Romano & Fjermestad, 2003), E-CRM marketing techniques (Jackson & Wang 1995; Pan & Lee, 2003), the adoption; of E-CRM in organizations (Wu & Wu, 2005), and E-CRM applications that facilitate Internet business (Wang & Head 2001; Adebajo, 2003). E-CRM is a newly developing customer-oriented business philosophy that reorients online enterprise operations in order to improve customer satisfaction, loyalty, and retention (Adebajo, 2003; Pan & Lee, 2003). This study suggests that online retailers should have a substantial understanding of factors that can influence a customer to maintain a long-term relationship with them. Davis (1986) proposed the technology acceptance model (TAM) to explain and predict user acceptance of information systems or information communication technology. In TAM, cognitive beliefs such as perceived usefulness and perceived ease of use are counted as key factors for technology acceptance.

A virtual store has been viewed as a new business model; some researchers have provided analogies between virtual stores and their physical counterparts. As both the presence and operation of virtual stores depend heavily on IT, they are often regarded as a type of IS. To retailers, virtual stores are their strategic IS, while to consumers, virtual stores are end-user IS. This view is justified by previous literature (Spiller and Lohse, 1997). Hence, when consumers accept and use virtual stores, they are accepting and using technologies and innovations. The theoretical constructs are behavior prediction, user acceptance, and innovation adoption. Theory of reasoned action (TRA), TAM, and IDT are among the widely supported theories that focus on these constructs.

TAM

TAM proposes that perceived ease of use and perceived usefulness of technology are predictors of user attitude towards using the technology, subsequent behavioral intentions and actual usage. Perceived ease of use was also considered to influence perceived usefulness of technology. Figure 2 presents original version of TAM (Davis, 1989). In TAM, perceived usefulness refers to the degree to which the user believes that using the technology will improve his or her work performance, while perceived ease of use refers to how effortless he or she perceives using the technology will be. Both are considered distinct factors influencing the user's attitude towards using the technology, though perceived ease of use is also hypothesized to influence perceived usefulness and attitude towards using the technology.

IDT

Innovation diffusion theory (IDT) is a technique to understand the motivators and inhibitors of an innovation use, because the theory provides insight into the factors that influence the adoption of innovations (Rogers, 1995). One theory associated with

research on technology innovation is IDT. It has been widely applied in disciplines such as anthropology, sociology, education, communication, marketing, etc (Zaltman and Stiff, 1989). Diffusion has been defined as “the process by which an innovation is communicated through certain channels over time among the members of a social system”, and an innovation is “an idea, practice, or object that is perceived as new by an individual or another unit of adoption”. Diffusion is achieved through user adoption, which is “the acceptance into use and the continued use of a new idea or thing” (Chen&Gillenson, 2002). IDT tries to explain the innovation decision process, the determining factors of rate of adoption, and different categories of adopters. The main contribution of IDT to our study is the set of innovation attributes. These help to explain the different rates of adoption by users.

Relationship between the Two Theories and This Research

Although they originated in different disciplines, TAM and IDT have some obvious similarities. The relative advantage construct in IDT is often considered to be the PU construct in TAM, and the complexity construct in IDT is extremely similar to the PEOU concept in TAM (Teng, Grover & Guttler, 2002).

This suggests that TAM and IDT reconfirm each other’s findings, which raises the authors’ confidence in the validity and reliability of these theories (Mols, 2000_). TAM and IDT often complement each other. IDT involves the formation of a favorable or unfavorable attitude toward an innovation; however, it does not provide further evidence on how the attitude evolves into the accept/reject decision. TAM, on the other hand, provides theoretical linkages among beliefs, attitude, intention, and action. TAM is criticized for ignoring the social influence on technology acceptance. Some empirical studies have suggested that TAM be integrated with other acceptance and diffusion theories to improve its predictive and explanatory power.

Wu (2005) explored the adoption of customer relationship management systems by integrating aspects of Davis’ (1989) technology acceptance model TAM with Roger’s (Roger, 1995) innovation diffusion theory (IDT). Their model includes factors to measure both IDT and TAM. The IDT factors include innovation, task, individual, organization, and environment. To measure innovation, they used relative advantage, compatibility, complexity, observability, and trialability using an instrument developed by Moore and Benbasat (Moore & Benbasat, 1991).

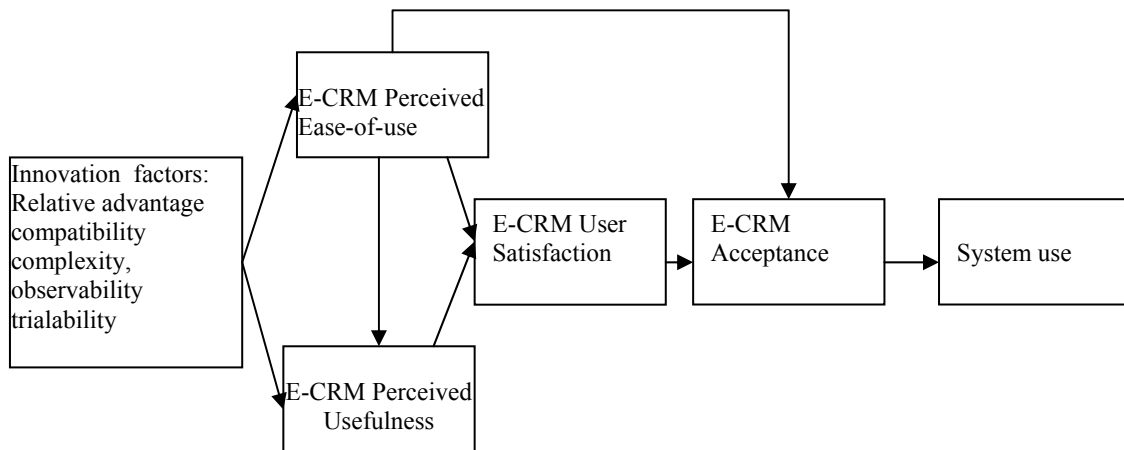


Figure 1 : The Structural model for the modified framework

- **Relative advantage** is the degree to which an innovation is perceived to be an enhancement of the current offerings.
- **Compatibility** refers to the extent to which an innovation is perceived to fit together with potential adopters' habits and practices.
- **Complexity** refers to the degree to which an innovation is perceived as being complicated to use.
- **Observability** is the degree to which the results of an innovation are observable to others.
- **Trialability** refers to the degree to which an innovation may be sufficiently tested prior to adoption.

Key Applications of e-CRM

One of the problems with the way CRM and performance has been measured is that the term often means different things to different people, creating confusion and uncertainty. To alleviate this problem we focus specifically on E-CRM programs as defined in a SAS Institute white paper (2000): the creation of knowledge from process automation and the collection, synthesis and delivery of data derived from the Internet and information technology (IT) based interactions between the company and its customers/channel partners.

Companies understand that E-CRM has significant potential, but they face the challenge of building the required technology infrastructure quickly and cost-effectively. An easily predictable reaction is to buy off-the-shelf applications, cobble together a database of Web traffic and online purchase information, and launch an E-CRM initiative (Coopee,2000). Uncertainty and ambiguity are likely to characterize E-CRM programs that draw on potentially unreliable components. These components comprise IT infrastructure (databases, software, and networks and a diversity of

stakeholders) executives and managers; frontline sales and business analysts; and IT professionals. Hence, the way in which individual executives and senior managers view E-CRM using the concept of mindfulness and mindlessness can potentially provide an important measure of how organizations determine whether, when, and how to invest in an E-CRM program and the final success the company will enjoy from these programs (McGarry, ,2006). Web-based CRM applications provide integrated marketing, sales, e-commerce, and customer support services to the enterprise through a single, customized Web interface. To be truly effective, an E-CRM infrastructure must provide internal personnel with a single view of the customer, regardless of how they are interacting with the company and which E-CRM applications they are using.

Model description

According to TAM, usage behavior is determined by intentions towards using the system, while intention is jointly determined by two related beliefs: perceived ease-of-use (PEOU) and perceived usefulness (PU). Perceived usefulness is influenced by perceived ease-of-use because, other things being equal, the easier the system is to use the more useful it can be (Crosby &Johnson, 2000). Therefore, hypothesized that:

Hypothesis 1. E-CRM perceived ease-of-use will positively influence E-CRM perceived usefulness.

The rationale for the link between PEOU and usage is grounded on innovation theory, which suggests that the degree that an innovation is perceived as relatively difficult to understand and use would affect the rate of its adoption (Rogers, 1995).

Hypothesis 2. E-CRM perceived ease-of-use will positively influence E-CRM acceptance.

Hypothesis 3. innovation factors will positively influence E-CRM perceived ease-of-use.

Hypothesis 4. innovation factors will positively influence E- CRM perceived usefulness.

Users' compatibility , observability and trialability with E-CRM information system will positively influence their attitudes to use.

salespersons who believe that the system is easy-to-use and useful will tend to hold a more positive attitude [i.e. satisfaction] towards the system.

Hypothesis 5. E-CRM perceived ease-of-use will positively influence user satisfaction.

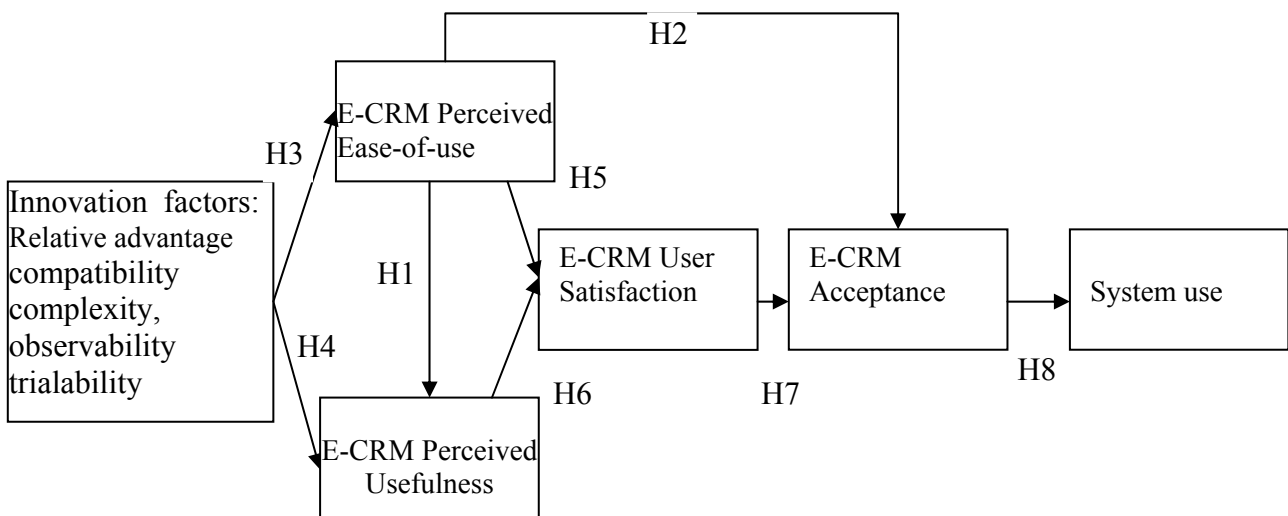
Hypothesis 6. E-CRM perceived usefulness will positively influence user satisfaction.

CRM user satisfaction is frequently employed as a surrogate of IS success and refers to the extent to which the system meets the needs of the users (Doll & Torkzadeh, 1988).

It is reasonable to expect that a salesperson that feels satisfied with the information that the system provides, regarding his/her customer profiles, will use and finally accept the system.

Hypothesis 7. User satisfaction will positively influence E-CRM acceptance.

Hypothesis 8. E-CRM acceptance will positively influence system use.



Methodology

This research combines IDT and TAM .it puts forward a new hybrid technology acceptance model to use to study Using the E-CRM information system in Iran's Clothing Industry. By explaining E-CRM information system from a user's perspective ,the finding of this research not only help to develop a more user –acceptable E- CRM information system , but also provide insight into the best way to promote new IT systems to potential users.

Data collection and sampling

This research regards the clothing industry in Iran as the focus of research, questionnaires were emailed to salespersons in 15 companies in Iranian clothing industry, requesting them to fill out the questionnaire and send it back by e-mail. 120 questionnaires were mailed but only 85 had returned. The rate of response of the questionnaire was 70/3%.

Research design

This research has adopted structural equation modeling for its data analysis to study the causalities among all parameters constructed for each model. Nine model –fit measures were used to assess the model’s overall goodness -of- fit: the first step in model testing was to estimate the goodness-of-fit of the hypothesized research model. Hence, was suggested χ^2 / df ratio (df : degrees of freedom). This ratio should not exceed 5 for models with good fit, and was estimated as 1.43 in our hypothesized model. goodness -of- fit index (GFI);normalized fit index (NFI),it is sensitive to sample size and may indicate poor fit with small samples even when the model is accurate ,non –normalized fit index(NNFI);comparative fit index (CFI);incremental fit index(IFI);root mean square error of approximation (RMSEA); and root mean square residual (RMSR). This is corrected in NNFI via appropriate normalization. Both NFI and NNFI assume the goodness-of-fit statistic to follow a central χ^2 distribution or at least approximate to a non-central χ^2 distribution in large samples (this may not hold true with models having large misspecifications); CFI is robust to this assumption (Chen & Gillenson, 2002). Though each fit metric is own way, the three measures collectively provide a reasonable estimation of overall model fit.

In general, NFI, NNFI, and CFI greater than 0.90 are indicative of good model fit.

Table 1 : Summary of overall fit indices for the measurement model

Models	χ^2 / df	GFI	NFI	NNFI	CFI	IFI	RMSEA	RMSR
Recommended value	≤ 5	≥ 0.9	≥ 0.9	≥ 0.9	≥ 0.9	≥ 0.9	≤ 0.05	≤ 0.1
Measurement model	1.43	0.921	0.956	0.996	0.996	0.986	0.048	0.039

Table 2: Measurement model results

Construct	Mean	SD	Cronbach’s a
Innovation factors:			
Relative advantage	3.98	.65	.74
Compatibility	3.54	.95	
Complexity	4.04	.85	
Observability	4.25	.72	
Trialability	3.90	.68	
E-CRM Perceived Ease-of-use	3.58	.78	.85
E-CRM Perceived Usefulness	3.24	.95	.72
E-CRM User Satisfaction	4.15	.88	.82
E-CRM Acceptance	2.15	.55	.71
System use	3.65	.47	.78

Discriminant validity is obtained because all pair-wise latent-indicator correlations are significantly different from one. Additional evidence for the discriminant validity of

the measures was provided by a series of pair-wise confirmatory factor analyses. Specifically, for each pair of measures, the chi-square difference test produced a significant result when items of different constructs were forced into a single-factor model.

Table 3: Pearson intercorrelations ¹, and coefficient alphas ² of studied measures

	1	2	3	4	5	6	7	8	9	10
Relative advantage	0.78									
Compatibility	0.36	0.88								
Complexity	0.06	0.14	-							
Observability	0.0	0.07	0.42	0.79						
Trialability	0.17	0.24	0.46	0.47	0.83					
E-CRM Perceived Ease-of-use	0.21	0.63	0.14	0.13	0.30	0.87				
E-CRM Perceived Usefulness	0.33	0.52	0.17	0.08	0.31	0.62	0.92			
E-CRM User Satisfaction	0.20	0.43	0.15	0.21	0.43	0.49	0.53	0.71		
E-CRM Acceptance	0.34	0.54	0.09	0.0	0.26	0.71	0.55	0.39	0.89	
System use	0.11	0.48	0.18	0.08	0.18	0.31	0.42	0.22	0.38	0.72

1-Correlations shown in bold are significant at least at the 0.05 level.

2-Coefficient alphas are shown in the diagonal.

Given that the purpose of the study is to test the hypothesized causal relationships among the constructs of the model, an appropriate statistical analysis is structural equation modeling with latent variables. Therefore Hypothesis were estimated. The results of this analysis are displayed on Table 4 but, direct paths were added in the hypothesized model and deleted all trivial paths (i.e. those that were not significant at 0.05).

Table 4: Standardized structural coefficients of trimmed model

Criterion variable	Predictor variables	Hypothesized relationship	Standardized coefficients	t-value ¹	R ² ²
Perceived ease-of-use	Relative advantage	+	0.17	2.38	0.68
	Compatibility		0.75	10.42	
Perceived usefulness	Perceived ease-of-use	+	0.58	7.65	0.54
	Complexity		0.31	4.02	
User Satisfaction	Perceived ease-of-use	+	0.69	11.36	0.78
	Trialability		0.28	4.98	
E-CRM acceptance	Perceived usefulness	+	0.32	3.59	0.65
	Relative advantage		0.21	1.63	
	Compatibility		0.17	2.59	
	Complexity		0.14	2.42	
	Observability		0.13	0.79	
	Trialability		0.19	2.88	
System use	CRM acceptance	+	0.33	3.57	.081

1-Coefficients in bold are statistically significant. T-values greater than 1.645 indicate significant effects at the 0.05 level., for a one-tailed test.

2- This is the total variance explained in the referent dependent variable based on the hypothesized model.

Conclusions

The paper presents a tool to enable improved strategic analysis for the purpose of developing better E-CRM systems. It shows the critical points of quality, from the customer's perspective, for Clothing Industry. E-CRM needs to be integrated into the product. Nothing would build trust and improve customer satisfaction as dramatically as the exchange of information through E-CRM. Firms which adopt these approaches will attract and retain new customers due to the exchange of information. The most important point is to identify and address the customer needs (Szmigin, Canning & Reppel, 2005). This must be done throughout the entire relationship. Not only can a firm's E-CRM yield information about a new product, but search engine companies have already harvested a goldmine of information about their customer's lifestyles, which could easily be incorporated into E-CRM systems in the Clothing sector. The results clearly demonstrate that innovation factors regarding E-CRM ease-of-use and E-CRM usefulness have a catalytic influence on system use. More analytically, the most important influence on performance comes from PU, followed by PEOU. In particular, the degree to which users believe that the CRM system is useful and easy-to-use leads to performance improvements.

Analysis of the IDT research variable: as regards compatibility, that compatibility has a great positive and direct effect on perceived usefulness and the behavioral intention to use. The higher the compatibility of E-CRM information system users, the higher the perceived usefulness (Zablah, Bellenger & Johnston, 2004). This study combines IDT, TAM and proposes a hybrid technology acceptance model to study Using the E-CRM Information System in Clothing Industry.

Using the new hybrid technology acceptance model as a theoretical framework, this study helps practitioners and researchers better understand why people resist using the E-CRM information system, predict how salespersons will respond to the E-CRM information system, and increases user acceptance by improving the techniques and processes by which they are implemented. Finally, organizations work in clothing industry must recognize the fact that the salesperson is the internal customer of any E-CRM system, whose Innovation factor must be understood, managed, and eventually satisfied, if system use are to be realized.

References

- Adebanjo, D. (2003). Classifying and selecting E-CRM applications: an analysis-based proposal. *Management Science*, 41(6), pp 570-577.
- Chen, L-D, Gillenson, M.L., and Sherrell, D.L., (2002), Enticing online consumers: an extended technology acceptance perspective, *Information & Management*, 39, pp 705 – 719.

- Coopee, (2000), T. E-CRM calls customer king. *InforWorld 22s* 26 .
- Crosby, L.A. and Johnson, S.L., (2000), Customer relationship management: is technology the new holy grail for customer loyalty, *Marketing Management*, 9, pp 4-5.
- Davis, F. D. (1989). Perceived usefulness, perceived ease of use, and user acceptance of information technology. *MIS Quarterly*, 13(3), pp319-340.
- Doll, W. J., & Torkzadeh, G. (1988). The measurement of end-user computing satisfaction. *MIS Quarterly*, 12(2),pp 259–274.
- McGarry, Y. ,(2006), Understanding the strategic value of customer relationship management. *Accountancy Ireland*,38(3), pp 72-74.
- Mols, N. P. (2000), The Internet and service marketing-the case of Danish retail banking, *Internet Research*, 10(1),pp 7-10.
- Moore, G. C., and Benbasat, I. (1991). "Development of an Instrument to Measure the Perceptions of Adopting an Information Technology Innovation." *Information Systems Research* (3): pp 192-222.
- Jackson, R., & Wang, P. (1995). *The convergence of database marketing and interactive media networks*. In E. Forrest & R. Mizerski (Eds.), *Interactive marketing: The future present* , pp 355-372, NTC Publishing Group.
- Pan, S. L., & Lee, J. (2003). Using e-CRM for a united view of the customer. *Communication of the ACM*, 46(4),pp 95-99.
- Rogers, E.M., 1995, *Diffusion of Innovation*, 4th Edition (New York: Free Press).
- Romano, N. C., & Fjermesad, J. (2003). Electronic commerce customer relationship management: A research agenda. *Information Technology and Management*, 4, pp 233-258.
- Spiller,p and Lohse, G.L. A classification of Internet retail store. *International Journal of Electronic Commerce* 2 2 (1997), pp 29–56.
- Szmigin, I., Canning, L., and Reppel, A. E. ,(2005), Online community: enhancing the relationship marketing concept through customer bonding. *International Journal of Service Industry Management*, 16(5), pp480-496.
- Teng, J.T.C., Grover, V., and Guttler,W. (2002), Information technology innovations: general diffusion patterns and its relationships to innovation characteristics. *IEEE Transaction on Engineering Management*, 49,pp 13 – 27.
- Wang, F, & Head, M., (2001), Designing Web-based information systems for e-commerce. In *Proceedings of the 224 World Congress on the Management of Electronic Commerce*. Hamilton, Canada.
- Wu, I. L., & Wu, K. W. (2005). A hybrid technology acceptance approach for exploring e-CRM adoption in organizations. *Behavior & Information Technology*, 24(4), pp 303-316.

Zablah, A., Bellenger, D., & Johnston, W,(2004), An evaluation of divergent perspectives on customer relationship management, *Industrial Marketing Management*,33(6),pp 475-489.

Zaltman, G. and Sttef, R. (1989), Theory of diffusion. In Consumer Behavior: Theoretical Sources, S. Ward and T.S. Robertson (Eds.), pp.416 – 468.

