



7th International Strategic Management Conference

An Investigation of the Effects of Technology Readiness on Technology Acceptance in e-HRM

Nihat Erdoğan^a, Murat Esen^{b,*}

^a*Istanbul Şehir University, Faculty of Business and Management, İstanbul, Turkey*

^b*Kocaeli University, Kocaeli Vocational High School, Kocaeli, Turkey*

Abstract

The aim of this paper is to investigate the effects of technology readiness on technology acceptance in e-HRM field. The data for this study were collected from 65 Human Resource (HR) managers representing top 500 largest private sector companies in Turkey. The research model based on two theories: Parasuraman's technology readiness and Davis' technology acceptance model. The results of the study showed that optimism and innovativeness dimensions of technology readiness positively influenced perceived usefulness and perceived ease of use, but discomfort and insecurity dimensions have not positive effect on them.

© 2011 Published by Elsevier Ltd. Open access under [CC BY-NC-ND license](https://creativecommons.org/licenses/by-nc-nd/4.0/).

Selection and/or peer-review under responsibility of 7th International Strategic Management Conference

Keywords: Technology readiness, technology acceptance, electronic human resources management (e-HRM)

1. Introduction

Using information and communication technologies in human resource services has become an important strategy to achieve competitive advantage for organizations. Information technologies are expected to provide the HR function with the opportunity to create new avenues for contributing to organizational effectiveness. It is observed that electronic human resource management (e-HRM) is gaining importance (Cedarstone, 2005) and the use of web-based technologies for human resource management practices, policies and processes is increasing within organizations. In spite of (e-HRM)

* Corresponding author. Tel.+90-262-349-3414; fax:+90-262-349-3997.

E-mail address: nihaterdogmus@sehir.edu.tr; mesen@kocaeli.edu.tr.

systems are being used with increasing frequency in organizations, there is relatively little research about eHRM applications and consequences for individuals and organizations.

It can be stated that the acceptance of the use of HRM information technology and systems by HR employees is a new and important research field. Therefore the purpose of the present study is to investigate the effects of “technology readiness” on “technology acceptance”. A research was conducted in e-HRM field to test the effects of technology readiness on technology acceptance. The paper based on two theories from complementary areas: Davis’s Technology Acceptance Model and Parasuraman’s Technology Readiness Index (TRI). Next section the two theories were summarized and then research methodology and findings were presented.

2.Literature Review

2.1. Electronic Human Resource Management (e-HRM)

Electronic human resource management (e-HRM) is used interchangeably with virtual human resource management, human resource intranet, web-based human resource management, computer-based human resource management systems and human resource portals (Ruel et al., 2004). EHRM can be narrowly defined as the administrative support of the HR function in organizations by using internet technology (Voermans and van Veldhoven (2007). E-HRM is also defined as a way of implementing HR strategies, policies, and practices in organizations through a conscious and directed support and/or with the full use of web-technology-based channels (Ruel et al. (2004). Another definition of EHRM is using computer systems, interactive electronic media and telecommunications network to fulfill HR functions (Strohmeier, 2007).

2.2.Technology Acceptance Model (TAM)

Determinants of technology use have been investigated to predict and explain end-user adoption and acceptance of information technology and systems. One of the first theories in this field is Fishbein and Ajzen’s generic Theory of Reasoned Action (TRA) that explains user’s attitude towards technology in the organizations. TRA argues that a person’s behavior is predicted by his or her behavioral intention. Now in this field the most prevalent model is Technology Acceptance Model (TAM) that was adapted from the Theory of Reasoned Action (TRA). TAM was developed by Fred Davis in 1985 to explain intention to use, and acceptance of new technology in organizations.

TAM has three key variables: Perceived usefulness (PU), perceived ease of use (PEU) and behavioral intention to use (BIU). Perceived usefulness is defined as the user’s subjective probability that using a specific application system will increase his or her job performance within an organizational context. Perceived ease of use refers to the degree to which the user expects the target system to be free of effort. Behavioral intention to use indicates an individual’s requests and efforts to perform a behavior. TAM asserts that the influence of external variables upon user behaviour is mediated through user beliefs and attitudes.

The reason choosing TAM for this research was because TAM has been tested empirically and supported through validations, applications, and replications (Venkatesh, 2000; Schaup et al., 2010; Lee, 2010; Yusoff, et. Al, 2010). TAM is one of the most powerful, robust and parsimonious model for predicting user acceptance especially in IS context (Bueno and Salmeron, 2008). According to Venkatesh (2000), the parsimony of TAM combined with its predictive power makes it easy to apply to different situations.

2.3.Technology Readiness Index (TRI)

Previous studies show that individuals have different personality and attitudes toward the use of technology (Rogers, 2003:17). Technology readiness has effect on acceptance of information technology and systems. Parasuraman (2000) has developed technology readiness index (TRI) scale to measure the level of readiness to use technology. TRI interested in the disposition of the using technology, instead of

competency to use (Parasuraman and Colby, 2001). TRI defines four groups of users on the basis of personality traits that are optimism, innovativeness, discomfort, and insecurity. Four types of personalities are defined in TRI as the following way:

Optimism: A positive belief about technology to increase control, flexibility and efficiency.

Innovativeness: A tendency to be the first using a new technology.

Discomfort: Having a need for control and a sense of being overwhelmed.

Insecurity: Distrusting technology for security and privacy reasons.

In the literature there are some studies to measure technology readiness and technology acceptance (Massey et al., 2005; Hendry, 2000; Taylor et al., 2005; Caison et al., 2008; Walczuch et al., 2007) but there is not any study in Turkey. We observe that in Turkey big scale organizations have relatively developed HRM systems and they have intention to use information technology in HRM. Therefore it will be important to investigate the effects of technology readiness on technology acceptance in HRM field.

In order to achieve this aim, a research model was formulated. Model based on the two theories: Parasuraman's technology readiness index and Davis' technology acceptance model. Research model can be seen in figure 1.

In order to test the influence of the technology readiness on perceived usefulness and perceived ease of the use in e-HRM field the following propositions are articulated:

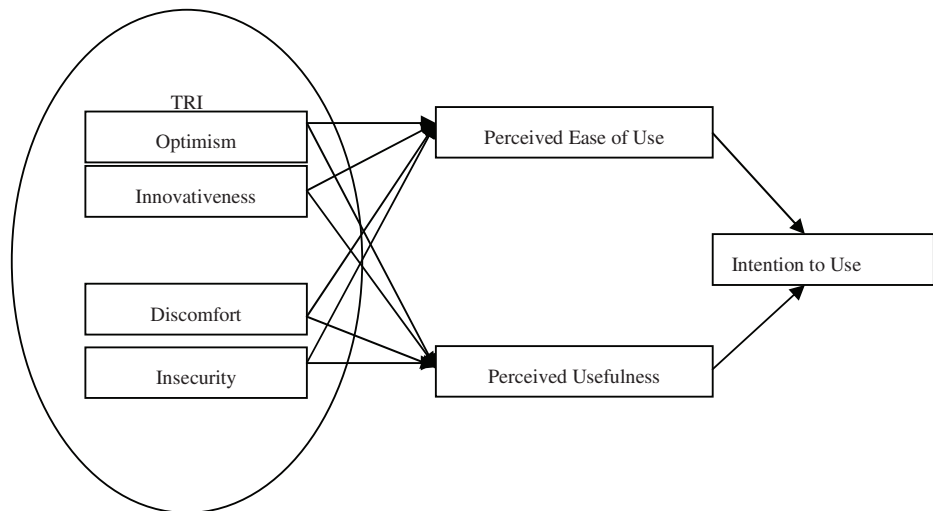


Fig. 1. Research Model

- H1-1: High personal optimism about technology in general leads to higher perceived ease of use.
 H1-2: High personal optimism about technology in general leads to higher perceived usefulness.
 H2-1: High personal innovativeness about technology in general leads to higher perceived ease of use.
 H2-2: High personal innovativeness about technology in general leads to higher perceived usefulness.
 H3-1: High personal discomfort with regard to technology in general leads to lower perceived ease of use.
 H3-2: High personal discomfort with regard to technology in general leads to lower perceived usefulness.
 H4-1: High personal insecurity with regard to technology in general leads to lower perceived ease of use.
 H4-2: High personal insecurity with regard to technology in general leads to lower perceived usefulness.
 H5: There will be a positive relationship between perceived ease of use and perceived usefulness.
 H6: There will be a positive relationship between perceived ease of use and intention to use.
 H7: There will be a positive relationship between perceived usefulness and intention to use.

3. Research Design

3.1. Sample

The data for this study were collected from a sample of Human Resource (HR) managers representing top 500 largest private sector companies in Turkey. The subjects included only HR decision makers about HRM. The participants from 65 companies in this study held a variety of positions within the HR professions. HR positions of participants were directors (30,8 per cent), managers (40 per cent), and experts (29,2 per cent).

The mean age of sample members was 36,3 years; 58,5 per cent were men, 41,5 per cent were women, and more than 96,9 per cent had at least a university degree. Mean position tenure was about 8,5 years.

3.2. Measure

The data for this study were obtained by using a questionnaire. The questionnaire was divided into two main parts: Technology readiness and technology acceptance. The survey instruments used in this study were Parasuraman's Technology Readiness Index (TRI) and Davis's Technology Acceptance Model (TAM).

The original technology readiness scale of Parasuraman consists of totally 36 items and divided into four dimensions: Optimism (10 items), innovativeness (7 items), discomfort (10 items), and insecurity (9 items). Technology acceptance scale of Davis has 13 items and 3 factors: Usefulness (5 items), ease of use (5 items), and intention to use (3 items). All measures were self-assessment type and a five-point Likert response format was used.

A prefaced letter in each questionnaire explained (1) the objective of the survey, (2) assurance of confidentiality and anonymity of respondents and, (3) voluntary nature of respondent participation. The questionnaires were sent to 500 participants and 65 were returned, which yields a total response rate of 13 per cent. Completed questionnaires were returned by post or e-mail.

In order to identify the underlying structure of various measures a series of factor analysis were carried out. Firstly, confirmatory factor analysis has been conducted to test factor structure of technology readiness index. It was found that factor structure was different from the original four-factor structure. Secondly 15 items, below .50, were excluded from technology readiness index and factor analysis was carried out again. Second factor analysis results showed that 21 items loaded on four factors as it was

previous studies. KMO score is 0.747 and BT is 584,745. The four factors explained %57.8 of the common variance. Cronbach alpha score of TRI is 0.743.

Factor analysis result of technology acceptance model indicated that total 13 items were divided into three factors that was similar to the three-factor structure found in previous studies. KMO is 0.872 and BT is 570.72 for TAM. This explained %69 of common variance and Cronbach alpha score is .846.

3.3. Data Analysis and Hypothesis Test Results

In this section basic statistics and the results of the hypothesis tests were presented. The results of the frequency analysis of the dimensions of TRI and TAM are shown in Table 1.

Table 1 shows that item reliability scores of scales have high reliability that is higher than accepted 0,70 level.

Table 1. Descriptive Statistics and Empirical Results Model

	Mean	S.D.	Loading
Optimism 1	4,33	0,64	0,73*
Optimism 2	4,40	0,55	0,74*
Optimism 3	4,30	0,76	0,74*
Optimism 4	4,33	0,69	0,73*
Optimism 5	4,36	0,65	0,75*
Optimism 6	4,09	0,87	0,74*
Optimism 7	3,61	0,86	0,74*
Innovativeness 1	3,96	0,63	0,73*
Innovativeness 2	3,70	0,87	0,73*
Innovativeness 3	3,63	0,99	0,72*
Innovativeness 4	3,81	1,02	0,73*
Innovativeness 5	4,09	0,86	0,73*
Innovativeness 6	3,72	0,99	0,73*
Discomfort 1	3,33	1,16	0,74*
Discomfort 2	3,32	1,09	0,72*
Discomfort 3	2,84	1,16	0,72*
Insecurity 1	3,30	1,29	0,73*
Insecurity 2	3,40	1,26	0,74*
Insecurity 3	3,64	1,13	0,73*
Insecurity 4	3,56	0,72	0,74*
Insecurity 5	3,86	1,14	0,75*
Usefulness 1	4,26	0,61	0,83*
Usefulness 2	4,29	0,65	0,83*
Usefulness 3	4,18	0,63	0,83*
Usefulness 4	4,13	0,76	0,83*
Usefulness 5	4,23	0,70	0,83*

Ease of Use 1	3,89	1,03	0,85*
Ease of Use 2	3,90	0,89	0,84*
Ease of Use 3	3,76	0,93	0,84*
Ease of Use 4	4,06	0,72	0,83*
Ease of Use 5	4,16	0,80	0,84*
Intention to Use 1	4,30	0,65	0,83*
Intention to Use 2	4,23	0,58	0,83*
Intention to Use 3	4,47	0,56	0,84*

Loading significant at the 0,05 level.

Secondly correlation matrix shown in Table 2 indicates internal consistency reliability and significant correlations for dimensions of technology readiness and technology acceptance.

Table 2. Correlation Matrix and Construct Level Statistics

	Mean	IC	1	2	3	4	5	6	7
1) Optimism	4.20	0.660	1						
2) Innovativeness	3.82	0.788	,060						
3) Discomfort	3.16	0.724	-,172	,146					
4) Insecurity	3.55	0.729	-,074	-,003	,116				
5) Perceived Usefulness	4.22	0.886	,506	,415	,370	-,124			
6) Perceived Ease of Use	3.96	0.889	,478	,551	,161	,038	,053		
7) Intention to Use	4.33	0.882	,425	,223	-,203	-,181	,779	,045	1

IC: Internal consistency reliability.

All correlation coefficient significant at the 0.05 level

The findings of correlation analysis showed that correlations between optimism and ease of use, optimism and usefulness, innovativeness and ease of use, innovativeness and usefulness are positive and high as they were expected. But correlations between discomfort and usefulness, discomfort and ease of use are unexpectedly positive. Correlation between insecurity and usefulness is negative but correlation between insecurity and ease of use is unexpectedly positive. Correlations between ease of use and intention to use is also positive. Lastly correlations between intention to use and usefulness and ease of use are positive. It is interesting that correlations between ease of use and other variables are unexpectedly different from previous studies.

Thirdly it was decided to construct a structural equation model of the influence of the technology readiness factors on technology acceptance. Structural equation model results and conclusion of hypothesis tests are seen in Table 3.

Table 3. Estimation Results of Structural Model

Relationship	Beta	t- Value	p- Value	Conclusion
Optimism – Usefulness	0.506	4,658	,000	H1-1 Supported
Optimism – Ease of Use	0.478	4,320	,000	H1-2 Supported
Innovativeness – Usefulness	0.415	3,624	,001	H2-1 Supported
Innovativeness – Ease of Use	0,551	5,240	,000	H2-2 Supported
Discomfort – Usefulness	0,37	0,292	,771	H3-1 Not Supported
Discomfort – Ease of Use	0.161	1,292	,201	H3-2 Not Supported
Insecurity – Usefulness	-0.124	0,305	,762	H4-1 Not Supported
Insecurity – Ease of Use	-0,029	0,229	,820	H4-1 Not Supported
Usefulness – Ease of Use	0,631	6,459	,000	H5 Supported
Usefulness – Intention to Use	0,779	9,861	,000	H6 Supported
Ease of Use – Intention to Use	0,045	0,357	,722	H7 Not Supported

It shows that TRI factors contribute significantly to assess perceived usefulness ($R^2= 0,325$ $p= ,000$) and perceived ease of use ($R^2= 0,394$ $p= ,000$). Usefulness and ease of use have significant influence on intention to use ($R^2= 0,607$ $p= ,000$). Results of regression analysis show that discomfort and insecurity dimensions have not influenced usefulness and ease of use. It is also seen that ease of use has not influenced intention to use. It can be said that perceived discomfort and insecurity of HR staff about e-HRM do not influence usefulness and ease of use of e-HRM.

4. Conclusion

The major findings of this study reveal that four types of technology readiness have different effects on perceived usefulness and perceived ease of use about e-HRM. Optimism and innovativeness dimensions of technology readiness have positive effects on perceived usefulness and perceived ease of use. These findings are similar with previous studies (Walczuch and al, 2007). On the contrary it was found that discomfort and insecurity dimensions have not any significant effects on perceived usefulness and perceived ease of use. This is different from findings of previous studies. Earlier studies reported that generally the effects of discomfort and insecurity on perceived usefulness and perceived ease of use are negative.

In concluding this paper, it can be argued that since personality influences technology use, organizations should be aware of this relationship when initiating information systems. In other words organizations must adopt their strategy on how to increase technology acceptance on the basis of user's personalities. Each personality type could have positive as well as negative effects on the use and adoption of information technologies in an organization. When planning e-HRM system, HR practitioners must predict whether the new system will be acceptable to HR users. Since investment on systems and technology requires time and money, user acceptance is critical for introducing new information technologies into organizations.

In this study, the effects of technology readiness on the perceived usefulness and perceived ease of use were investigated in e-HRM. Future studies should focus on dimensions of technology acceptance in different organizational settings and different industries by using well-designed research models. The results of the study showed that ease of use dimension is unexpectedly different from previous studies. Therefore especially ease of use dimension should be examined in future studies.

References

- [1] Ajzen I., 1991, "The Theory of Planned Behavior", *Organizational Behavior and Human Decision Processes* (50:2), pp. 179-211.
- [2] Bueno S, Salmeron JL, 2008, TAM-based success modeling in ERP. *Interact. Comp.* 20(6), pp.515-523.
- [3] Büyükoztürk, Ş. 2004, *Veri analizi el kitabı*, PegemA Publishing, Ankara.
- [4] Cedarcrestone, 2005, *The Cedarcrestone 2005 Workforce Technologies And Service Delivery Approaches Survey*, 8th Annual Edition.
- [5] Caison ve Diğerleri, 2008, "Exploring The Technology Readiness Of Nursing And Medical Students At A Canadian University", *Journal Of Interprofessional Care*, 22(3), pp.283 – 294.
- [6] Davis Fred D., 1985, "A Technology Acceptance Model For Empirically Testing New End-User Information Systems: Theory and Results, Ph.D. In Management, Massachusetts Institute of Technology.
- [7] Davis Fred D., 1989, "Perceived usefulness, perceived ease of use, and user acceptance of information technology" *MIS Quarterly*, 13(3), pp. 319-340
- [8] Davis F.D., Bagozzi R.P., Warshaw P.R., 1989, "User acceptance of computer technology: A comparison of two theoretical models", *Management Science*, 35(8), pp.985
- [9] Fishbein, M., & Ajzen, I., 1975, "Belief, attitude, intention, and behavior: An introduction to theory and research", Reading, MA: Addison-Wesley.
- [10] J. Hendry, 2000, Technology readiness and educational choice: Is there a relationship between technology readiness and the decision to study on-line? *Visionary Marketing for the 21st Century: Facing the Challenge*, www.anzmac.org
- [11] Lee MC, 2010, Explaining and predicting users' continuance intention toward e-learning: an extension of the expectation-confirmation model. *Comp. Edu.*, 54: 506 – 516.
- [12] Legris P., Ingham J. ve Collette P., 2003, "Why do people use information technology? a critical review of the technology acceptance model", *Information and Management*, Vol. 40, pp. 191-204
- [13] M.G. Martinsons, 1997, "Human Resource Management Applications of Knowledge-Based Systems", *International Journal of Information Management*, Vol.17, Nr:1, pp.35-53

- [14] Massey A. P., Khatri V., Ramesh V., 2005, From The Web To The Wireless Web: Technology Readiness And Usability, Proceedings Of The 38th Hawaii International Conference On System Sciences.
- [15] Parasuraman A., 2000, Technology Readiness Index (TRI): A Multipleitem Scale To Measure Readiness To Embrace New Technologies, *Journal Of Service Research* 2:307.
- [16] Parasuraman A., 2001, C.L. Colby, *Techno-Ready Marketing: How and Why Your Customers Adopt Technology*, Free Press, New York.
- [17] Rogers E., 2003, *Diffusion of Innovation*. The Free Press, New York, 5. Baskı, pp.5.
- [18] Rogers E.M., Shoemaker F.F., 1971, *Communication of Innovations: A Cross-Cultural Approach*, Free Press, New York.
- [19] Ruel, Huub and Bondarouk, Tanya and Looise, Jan Kees. 2004, E-HRM: Innovation or Irritation : An Explorative Empirical Study in Five Large Companies on Web-based HRM. *Management Revue*, 15 (3), pp. 364-380.
- [20] Schaup LC, Carter L, McBride ME, 2010, E-file adoption: a study of U.S. taxpayers s intention. *Comp. Hum. Beh.* 26(4): 636 - 644.
- [21] Sharp H. Jason, 2007, "Development, Extension, and Application: A Review of the Technology Acceptance Model", *Information Systems Educational Journal*, Vol.5, Nr.9.
- [22] Strohmeier, S., 2007, "Reserch in e-HRM: Review and Implications", *Human Resource Management Reveiw*, 17, pp.19-37.
- [23] Straub D., Limayen M., Karahanna-Evaristo E., "Measuring system usage: implications for IS theory testing", *Management Science* Nr.41, pp.1328–1342.
- [24] Taylor S.A, Goodwin S., Celuch K., 2005, "An Exploratory Investigation into the Question of Direct Selling via the Internet in Industrial Equipment Markets", *Journal of Business To Business Marketing*, Vol.12, Issue.2, pp.39-72
- [25] Venkatesh V., M. Morris, G. Davis, F. Davis, 2003, "User Acceptance of Information Technology: Toward a Unified View", *MIS Quarterly* Vol. 27. Nr.3, pp.425-478.
- [26] Venkatesh V., F. D. Davis, 2000, "A Theoretical Extension Of The Technology Acceptance Model: Four Longitudinal Field Studies", *Management Science*, 46(2), pp.186-204.
- [27] Walczuch and at al, 2007, "The Effect Of Service Employees' Technology Readiness On !Technology Acceptance", *Information ve Management*, 44, pp.206–215.
- [28] Voermans, M., M. Van Veldhoven, 2007. "Attitude towards E-HRM: an empirical study at Philips", *Personnel Review*, Vol. 36 Iss: 6, pp.887 – 902
- [29] Yusoff, Y. M.; T. Ramayah and Haslindar Ibrahim, 2010 E-HRM: A proposed model based on technology acceptance model. *African Journal of Business Management* Vol. 4(13), pp. 3039-3045.