Factors Affecting the Acceptance of Green Information Technology among Managers

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Abstract

Today, information and communication technologies are developing and expanding in all parts of the country. As we see increasing attention to this technology in various institutions and organizations. The issue of green information technology is also considered as one of the most important issues in the world due to the spread of information technology. The present study aims to investigate the factors influencing the acceptance of green information technology in information technology managers of executive bodies. The research method is descriptive and of the correlation type, and the questionnaire collection tool is used, and at the inferential level, the structural equation model including confirmatory factor analysis and the one-sample t-test have been used. In this regard, the Davis technology acceptance model has been used for conceptualization. The findings of the research showed that among the factors of green information technology knowledge, green management culture, social motivations and demographic factors, only the factor of green management culture has an effect on perceived usefulness. Also, among the aforementioned factors, only the factor of social motivation has not affected the ease of using information technology. Other results of the research showed that the perceived usefulness and ease of use of technology are effective on the attitude towards use and finally on the behavioral intention to use information technology. The results of structural equation modeling showed that the research model has an acceptable fit.

Keywords: Green information technology, Green management culture, Social motivations

Introduction

Information and communication technology is considered as the newest science in the world. This science has advantages and disadvantages. Therefore, green information technology tries to take an effective step against the disadvantages of information technology by working in the field of environment. If information technology is used decisively, it can be beneficial for environmental sustainability. It seems that most companies around the world have realized this, as they invest more in information technology tools that consume less

energy and are ultimately more efficient (1). The definition of green information technology is the production, management, use and consumption of information technology in the way of minimizing damage to the environment (2). In green information technology, the goal is to reduce pollution, reduce harmful environmental effects, and reduce negative effects on resources and energy consumption (3). One of the important and strategic decisions of the senior information managers of the organization is the long-term and overall sustainability of the organization, creating a capability and capacity in order to design the information technology roadmap for business and industry to be ahead of the competitors. According to the current trends and trends in various industries, information technology organizations are required to choose and implement a part of their strategies in the form of environmental sustainability (green). This means that the development of industrial frameworks to offer the best green practices is also necessary (4). In this way, green information technology has become a very important issue for organizations, but unfortunately, not every organization is ready to apply green information technology.

At present, green information technology is still in the first period of growth, and it is necessary to carry out detailed investigations on the issue of green information technology (5). Undoubtedly, the movement towards new technologies is undeniable for organizations. Before transferring technology, organizations should analyze all aspects of technology entry into their organization, which can be done by using a technology acceptance model that examines the issue comprehensively and comprehensively (6).

All the topics mentioned have caused the necessity of green information technology to increase today more than any time in the past, because today information technology and the use of its services have become an integral part of human life. Considering the importance and necessity of green information technology and its importance in organizations, the level of preparedness of senior information technology managers in the establishment of green information technology was examined.

The necessity of conducting this research comes from the fact that a review of the research literature showed that the research conducted on the state of acceptance of green information technology and the factors affecting it in Iran is very limited. The conducted surveys show that the factors affecting the acceptance of information technology have been measured and there has been no discussion about the factors affecting the acceptance of green information technology; Therefore, it seems necessary to conduct a research in this field in order to determine the factors affecting the adoption of green information technology. The practical importance of the current research increases in the sense that it will provide practical applications for managers and executive trustees of the country.

The research hypothesis is: Factors (knowledge of green information technology, green management culture, social motivations and demographic factors) have an effect on the acceptance of green information technology in information technology managers of executive bodies.

Research Methodology

The current research is applied in terms of purpose and descriptive-correlational in terms of method.

The statistical population of this research includes all managers of the executive bodies, which are more than 96 people. To select managers, due to the small size of the population, the census sampling method was used, and the sample size was determined to be 96 people. Among the surveyed respondents, 10 people (11.9 %) had post-graduate education, 48 people (57.1 %) had bachelor's degrees, 24 people (28.6 %) had post-graduate degrees, and 2 people (2.4 %) had doctoral education. According to the data analysis, among the surveyed respondents, 33 people (39.3 %) had less than 10 years of experience, 42 people (50 percent) had 10 to 20 years of experience, and 9 people (10.7 %) had experience of 20 years or more. .

The data collection tool is a researcher-made questionnaire with 33 questions that has components of technological knowledge (questions 1 to 6), green management culture (questions 7 to 10), social motivations (questions 11 to 12), and perceived usefulness (questions 13 to 17), perceived ease (questions 18 to 22), attitude towards use (questions 23 to 28), decision to use (questions 29 to 33), were used. This questionnaire has questions with a Likert scale of 5 options (very high-high-moderate-low-very low).

The construct validity of the green information technology knowledge questionnaire was tested with confirmatory factor analysis (CFI) using AMOS18 software and it was found that the questionnaire has appropriate validity. In this research, Cronbach's alpha method was used to calculate the internal consistency (reliability) of the questionnaire.

In order to evaluate the proposed model, structural equation modeling (SEM) was used and SPSS software was used. The significance level to verify the research hypotheses is α = 5%.
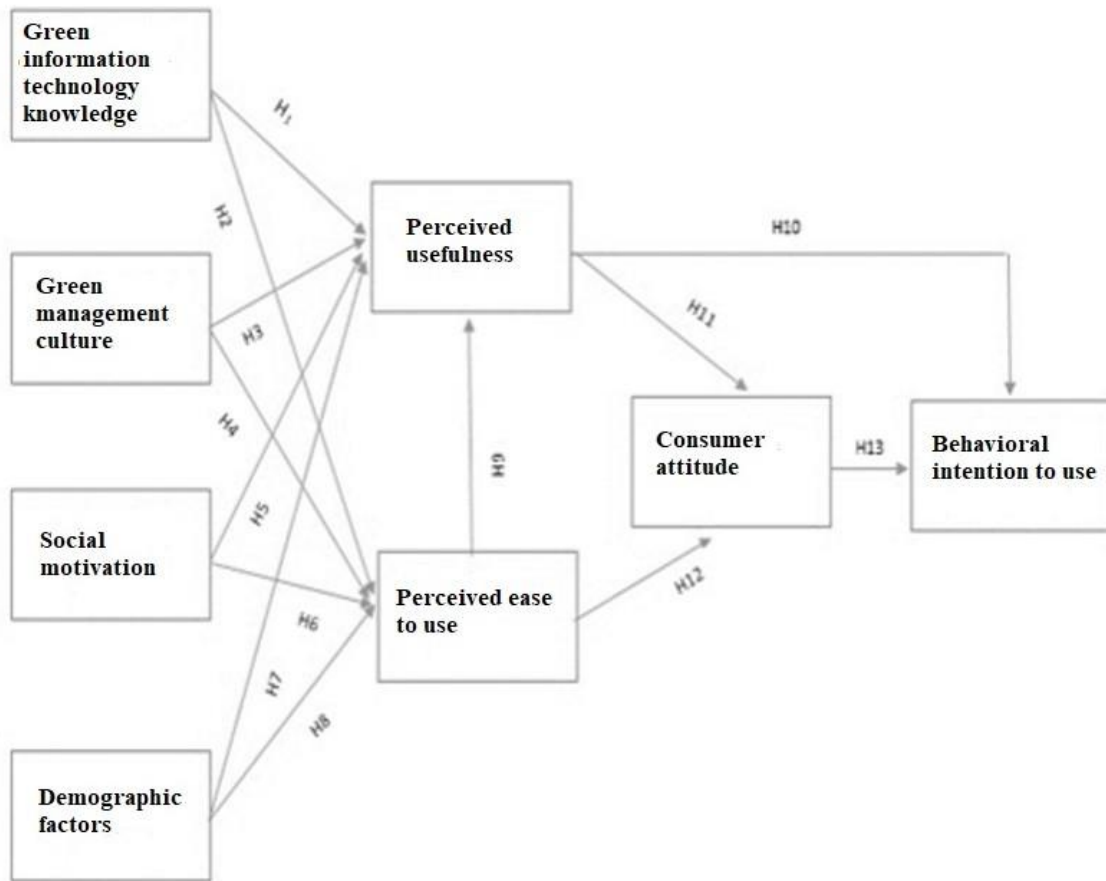

Figure 1: Conceptual model of the research

Findings

Checking the assumption of normality of the variables.

Table 1: Kolmogorov–Smirnov test statistics to check the assumption of normality of the variable

Variable	Kolmogorov–Smirnov test	Sig.
Green information technology knowledge	1.289	0.054
Green management culture	1.627	0.01

Social motivations	1.992	0.001
Perceived usefulness	1.206	0.109
Perceived ease to use	1.303	0.059
Consumer attitude	1.288	0.052

Due to the fact that the significance of Kolmogorov–Smirnov test in this variable is more than 0.05 level, therefore the null hypothesis is not rejected, as a result, it can be said that most of the research variables have a normal distribution. Therefore, parametric tests have been used to test research hypotheses.

Fitting the conceptual model of research through the structural equation model

Structural equation modeling (SEM) was used to evaluate the proposed model. Before examining the structural coefficients, the suitability of the model was examined. The fit of the initial model based on the fit indices used in this study is reported in the first row (refined model) of Table 2.

Table 2: Fit indices for the prepared models, the final model and the independence model

Model fit indices	X2	Df	X2/Df	NPAR	GFI	AGFI	IFI	TLI	CFI	NFI	RMSEA
Early compiled model	2193.6	547	4.01	83	0.458	0.376	0.419	0.357	0.409	0.351	0.19
Refined model	1364.51	539	2.53	91	0.852	0.811	0.909	0.876	0.904	0.896	0.098
Independence model	3379.19	595	5.68	35	0.15	0.1	-	-	-	-	0.237

As the contents of Table 2 show, the first model does not have a good fit. In the next steps, the model is improved and the fit indices of the final model are accepted.

According to the values of the developed model fit indices (Figure 2), it can be said that the conceptual model presented in this research is acceptable. That is, the factors are effective on the acceptance of green information technology by information technology managers of executive bodies.
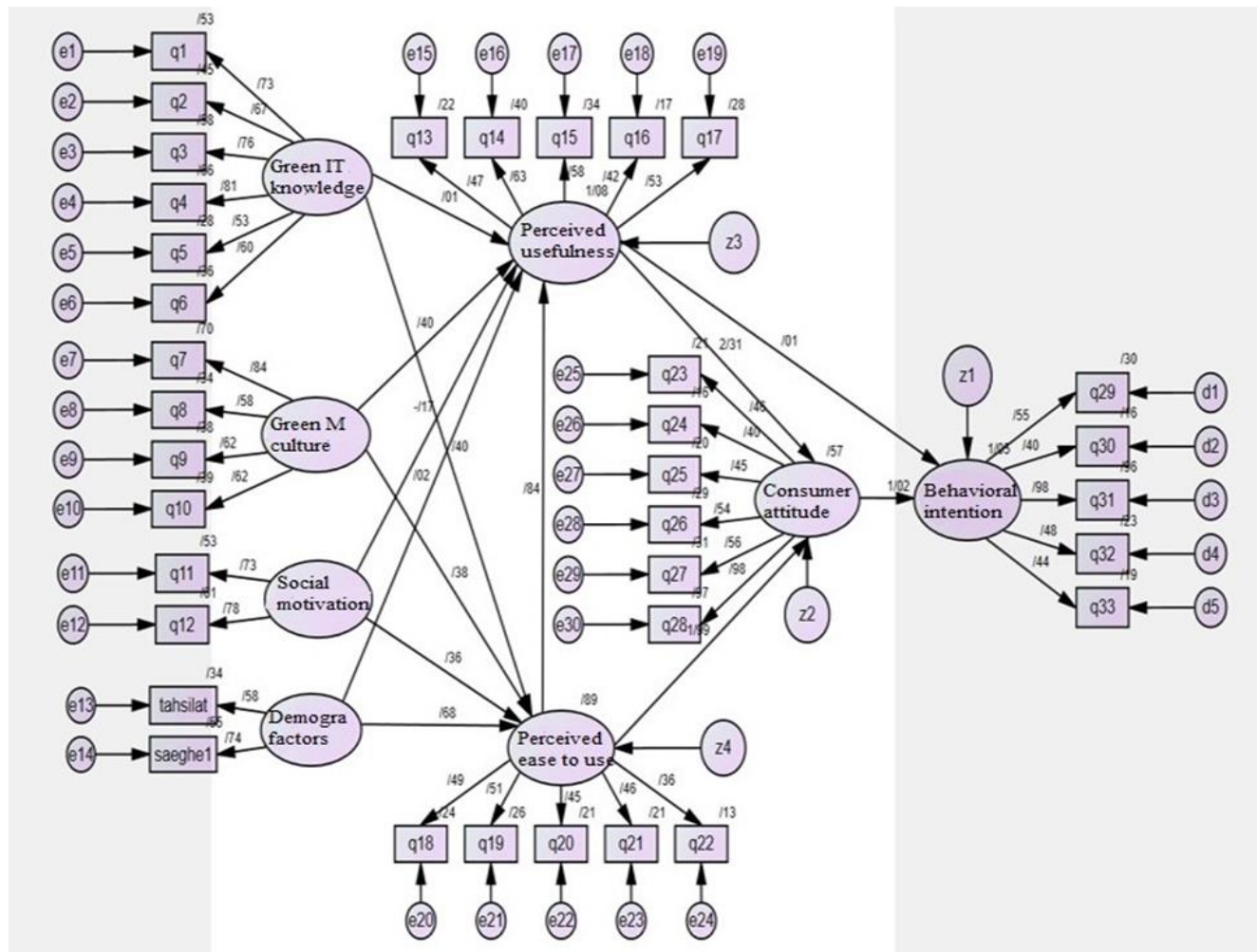
4

Figure 2: Compiled model of factors influencing the adoption of green information technology by information technology managers of executive bodies

The results obtained from the test of the above model show that the regression coefficient of the relationship between green management culture and perceived usefulness is equal to 0.4. And because P value (significance) is equal to 0.01 and smaller than the significance level of 0.05 (α=0.05), it can be said that there is a significant relationship between green management culture and perceived usefulness. Considering the positiveness of the regression coefficient, it can be said that with the increase of green management culture, the perceived usefulness also increases.

Other results of the model show that the regression coefficient of the relationship between green information technology knowledge and perceived ease of use is equal to 0.47. And because P value (significance) is equal to 0.015 and smaller than the significance level of 0.05 (α=0.05), it can be said that there is a significant relationship between the knowledge of green information technology and perceived ease of use. Considering the positiveness of the regression coefficient, it can be said that with increasing knowledge of green information technology, perceived ease of use also increases.

According to the results of the regression coefficient model, the relationship between green management culture and perceived ease of use is equal to 0.4, and because P value (significance) is equal to 0.028 and smaller than the significance level of 0.05 (α=0.05).

5

As a result, it can be said that there is a significant relationship between green management culture and perceived ease of use. Considering the positiveness of the regression coefficient, it can be said that with the increase in green management culture, the perceived ease of use also increases.

The regression coefficient of the relationship between demographic factors and perceived ease of use is equal to 0.66, and since P value (significance) is equal to 0.015 and smaller than the significance level of 0.05 (α=0.05). As a result, it can be said that there is a significant relationship between demographic factors and perceived ease of use. Considering the positiveness of the regression coefficient, it can be said that with the increase in demographic factors, the perceived ease of use also increases.

The regression coefficient of the relationship between perceived ease of use and perceived usefulness is equal to 0.74, and since P value (significance) is equal to 0.044 and smaller than the significance level of 0.05 (α=0.05). As a result, it can be said that there is a significant relationship between perceived ease of use and perceived usefulness. Considering the positiveness of the regression coefficient, it can be said that with the increase in the perceived ease of use, the perceived usefulness also increases.

The regression coefficient of the relationship between the perceived usefulness and the attitude to use is equal to 0.99, and since P value (significance) is equal to 0.006 and smaller than the significance level of 0.05 (α=0.05). As a result, it can be said that there is a significant relationship between perceived usefulness and attitude towards use. Considering the positiveness of the regression coefficient, it can be said that with the increase in perceived usefulness, the attitude to use also increases.

The regression coefficient of the relationship between the perceived ease of use and the attitude to use is equal to 0.99 and because P value (significance) is equal to 0.04 and smaller than the significance level of 0.05 (α=0.05). As a result, it can be said that there is a significant relationship between perceived ease of use and attitude towards use. Considering the positiveness of the regression coefficient, it can be said that with the increase in perceived ease of use, the attitude towards use also increases.

The regression coefficient of the relationship between the attitude towards use and the behavioral tendency to use is equal to 0.99 and because P value (significance) is equal to 0.001 and smaller than the significance level of 0.05 (α=0.05). As a result, it can be said that there is a significant relationship between the attitude to use and the behavioral desire to use. Considering the positiveness of the regression coefficient, it can be said that with the increase in the attitude to use, the behavioral tendency to use also increases.

Discussion

Analysis of research hypotheses:

Factors (knowledge of green information technology, green management culture, social motivations and demographic factors) have an effect on the acceptance of green information technology by information technology managers of executive bodies.

Based on the results of suitability indicators, it shows that various factors are effective on the acceptance of green information technology by information technology managers of executive bodies, so this research hypothesis is confirmed. Therefore, the main hypothesis of the research is confirmed in the sense that changes in the amount of various factors among managers cause changes in the amount of acceptance of green information technology by them and it goes to the positive (increasing) side. The results of the main hypothesis of the research show that there is a direct and meaningful relationship between various factors (green information technology knowledge, green management culture, social motivations and demographic factors) with the acceptance of green information technology by information technology managers of executive bodies. And these results are consistent with the findings of many researches in this field (7-10).

The knowledge of green information technology of information technology managers of executive bodies affects the perceived usefulness of this technology.

The data analysis shows that the regression coefficients between the two variables of managers' knowledge of green information technology and the perceived usefulness of green information technology are greater than the significance level of 0.05, therefore, at this level, the assumption that there is no relationship cannot be rejected. As a result, there is no significant relationship between managers' green information technology knowledge and their perceived usefulness. Therefore, the first sub-hypothesis of the research has not been confirmed.

Managers' knowledge of green information technology is effective on the perceived ease of use of this technology.

The research results show that the regression coefficient of the relationship between green information technology knowledge and perceived ease of use is equal to 0.47. And because the P value (significance) is equal to 0.015 and smaller than the significance level of 0.05 (α=0.05), it can be said that there is a significant relationship between the knowledge of green information technology and perceived ease of use. Therefore, the second sub-hypothesis of the research is confirmed in the sense that changes in the level of knowledge of green information technology among managers cause changes in the perceived ease of use of this technology and it moves to the positive (increasing) side. These results are consistent with the findings of a research in 2015 (8).

Managers' green management culture has an effect on perceived usefulness of green information technology.

Based on the research results, it shows that the regression coefficient of the relationship between green management culture and perceived usefulness is equal to 0.4. And because P value (significance) is equal to 0.01 and smaller than the significance level of 0.05 (α=0.05), it can be said that there is a significant relationship between green management culture and perceived usefulness. Therefore, the third sub-hypothesis of the research is confirmed. These results are consistent with previous research findings (10).

Managers' green management culture is effective on perceived ease of use of green information technology.

Based on the research results, the regression coefficient shows that the relationship between green management culture and perceived ease of use is equal to 0.4. And because the P value (significance) is equal to 0.028 and smaller than the significance level of 0.05 (α=0.05), it can be said that there is a significant relationship between green management culture and perceived ease of use. Therefore, the fourth sub-hypothesis of the research is confirmed in the sense that changes in the amount of green management culture among managers cause changes in the perceived ease of use of their green information technology and it moves to the positive (increasing) side. These results are consistent with previous research findings (10, 11).

Managers' social motives are effective on perceived usefulness of green information technology.

Data analysis shows that the regression coefficient between the two variables of managers' social motivations and perceived usefulness of green information technology is greater than the significance level of 0.05. Therefore, at this level, the assumption that there is no relationship is not rejected, and as a result, there is no significant relationship between managers' social motivations and their perceived usefulness. Therefore, the fifth sub-hypothesis of the research has not been confirmed.

Managers' social motivations are effective on perceived ease of use of green information technology.

The data analysis shows that the regression coefficient between the two variables of managers' social motivations and perceived ease of use of green information technology is greater than the significance level of 0.05, therefore, at this level, the assumption that there is no relationship cannot be rejected. . As a result, there is no significant relationship between managers' social motivations and their perceived ease of use. Therefore, the sixth sub-hypothesis of the research has not been confirmed.

Demographic factors of managers are effective on perceived usefulness of green information technology.

7

The data analysis shows that the regression coefficients between the two variables of managers' demographic factors and the perceived usefulness of green information technology are greater than the significance level of 0.05, therefore, at this level, the assumption that there is no relationship cannot be rejected. As a result, there is no significant relationship between managers' demographic factors and their perceived usefulness. Therefore, the seventh sub-hypothesis of the research has not been confirmed.

Demographic factors of managers are effective on perceived ease of use of green information technology.

Based on the results of the research, the regression coefficient shows that the relationship between demographic factors and perceived ease of use is equal to 0.66. And because P value (significance) is equal to 0.015 and smaller than the significance level of 0.05 (α=0.05), it can be said that there is a significant relationship between demographic factors and perceived ease of use. Therefore, the eighth sub-hypothesis of the research is confirmed in the sense that changes in the amount of demographic factors among managers cause changes in the perceived ease of use of their green information technology and it moves to the positive (increasing) side. These results are consistent with previous research findings (7).

The level of ease of use perceived by managers is effective on the perceived usefulness of green information technology.

Based on the results of the research, the regression coefficient shows that the relationship between perceived ease of use and perceived usefulness is equal to 0.74. And because P value (significance) is equal to 0.044 and smaller than the significance level of 0.05 (α=0.05), it can be said that there is a significant relationship between perceived ease of use and perceived usefulness. Therefore, the ninth sub-hypothesis of the research is confirmed in the sense that the changes in the amount of perceived use among managers cause changes in the amount of perceived usefulness of their green information technology and it goes to the positive (increasing) side. These results are consistent with previous research findings (8).

The perceived usefulness of managers has an effect on their behavior to use green information technology.

The data analysis shows that the regression coefficients between the two variables of managers' perceived usefulness and their willingness to use green information technology are greater than the significance level of 0.05. Therefore, at this level, the assumption that there is no relationship is not rejected, and as a result, there is no significant relationship between the managers' perceived usefulness and their willingness to use green information technology. Therefore, the tenth sub-hypothesis of the research has not been confirmed.

Between the perceived usefulness of managers, their attitude towards using green information technology is effective.

Based on the results of the research, the regression coefficient shows that the relationship between perceived usefulness and attitude towards use is equal to 0.99. And because the P value (significance) is equal to 0.006 and smaller than the significance level of 0.05 (α=0.05), it can be said that there is a significant relationship between perceived usefulness and attitude towards use. Therefore, the 11th sub-hypothesis of the research is confirmed in the sense that the changes in perceived usefulness among managers cause changes in their attitudes towards using green information technology and it moves to the positive (increasing) side. These results are consistent with previous research findings (7).

The perceived ease of use of managers affects their attitude to use green information technology.

Based on the results of the research, the regression coefficient shows that the relationship between perceived ease of use and attitude towards use is equal to 0.99. And because the P value (significance) is equal to 0.04 and smaller than the significance level of 0.05 (α = 0.05), it can be said that there is a significant relationship between perceived ease of use and attitude towards use. Therefore, the twelfth sub-hypothesis of the research is confirmed in the sense that the changes in perceived ease of use among managers cause changes in their attitude towards using green information technology and it moves to the positive (increasing) side. These results are consistent with previous research findings (8).

Managers' attitude towards the use of green information technology has an impact on their behavior.

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Based on the results of the research, the regression coefficient shows that the relationship between attitude towards use and behavioral intention to use is equal to 0.99. And because the P value (significance) is equal to 0.001 and smaller than the significance level of 0.05 (α=0.05), it can be said that there is a significant relationship between the attitude to use and the behavioral desire to use. Therefore, the 13th sub-hypothesis of the research is confirmed in the sense that the changes in the level of attitude towards the use of green information technology among the managers cause changes in the level of their willingness to use green information technology. These results are consistent with previous research findings (7).

Conclusion

In summary, it can be said that the results of the present study showed that among the factors of knowledge of green information technology, green management culture, social motivations and demographic factors, only the factor of green management culture has an effect on perceived usefulness. Also, among the aforementioned factors, only the factor of social motivation has not affected the ease of using information technology. Other results of the research showed that the perceived usefulness and ease of use of technology are effective on the attitude towards use and finally on the behavioral intention to use information technology. The results of structural equation modeling showed that the research model has an acceptable fit.

References

1. 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): 982-1003

2. Sheridan, C. Curry, E., Guyon, B & Donnellan, B. (2014). Developing a sustainable IT capability: Lessons from Intel's journey. MIS Quarterly Executive, 11(2)

3. Zhang, Y., Wang, J., Xue, Y., & Yang, J. (2018). "Impact of environmental regulations on green technological" innovative behavior: An empirical study in China. Journal of Cleaner Production, 188. 763-773

4. Thompson T.S.H. Yeong Y.D. 2003. Assessing the consumer decision process in the digital marketplace, Journal of Omega, Vol.31: 349-363

5. Deng, Q., Ji, S., & Wang, Y. (2017)"Green IT practice disclosure: An examination of corporate sustainability" reporting in IT sector. Journal of Information, Communication and Ethics in Society, 15(2), 145-164

6. Yasa, N. N. K., Ratnaningrum, L. P. R. A., & Sukaatmadja, P. G(2016). The application of technology acceptance model on internet banking users in the city of denpasar. Journal Manajemen dan Kewirausahaan, 16(2), 93-102

7. Sulaiman, Ainin & Naqshbandi, M Muzamil & Dezdar, Shahin. Impact of adoption of Green IT practices on organizational performance. Quality & Quantity, 2016; 50(5). Doi: 10.1007/s11135-015-0244-7

8. Cater-Steel, Aileen & Tan, Wui-Gee. The role of IT service management in green IT. Australasian J. of Inf. Systems. 2010; 17(1). Doi: 10.3127/ajis.v17i1.609

9. Anthony Jnr, Bokolo & Majid, Mazlina & Romli, Awanis. Exploring Green Information Technology Implementation in Collaborative Enterprise. Advanced Science Letters, 2018; 24(10):7707-7715. Doi: 10.1166/asl.2018.13004

10. Theis, Vanessa & Schreiber, Dusan. Analysis of Green IT practices in technology-based organizations. Revista de Administração da UFSM. 2020; 13. 1530-1550. Doi: 10.5902/1983465936408

11. Chen, Adela & Watson, Richard & Boudreau, Marie-claude & Karahanna, Elena. (2010). An Institutional Perspective on the Adoption of Green IS & IT. Australasian J. of Inf. Systems. 2010; 17(1). Doi: 10.3127/ajis.v17i1.572