

Applying the Technology Acceptance Model (TAM) in Information Technology System to Evaluate the Adoption of Decision Support System

Md Azhad Hossain^{1*}, Anamika Tiwari², Sanchita Saha², Ashok Ghimire², Md Ahsan Ullah Imran², Rabeya Khatoon¹

¹Department of Business Administration, International American University, 3440 Wilshire Blvd STE 1000, Los Angeles, CA 90010, United States

²Department of Business Administration, Westcliff University, 17877 Von Karman Ave 4th Floor, Irvine, CA 92614, United States
Email: *azhad17@gmail.com

How to cite this paper: Hossain, M.A., Tiwari, A., Saha, S., Ghimire, A., Imran, M.A.U. and Khatoon, R. (2024) Applying the Technology Acceptance Model (TAM) in Information Technology System to Evaluate the Adoption of Decision Support System. *Journal of Computer and Communications*, 12, 242-256.

<https://doi.org/10.4236/jcc.2024.128015>

Received: July 15, 2024

Accepted: August 26, 2024

Published: August 29, 2024

Copyright © 2024 by author(s) and Scientific Research Publishing Inc.

This work is licensed under the Creative Commons Attribution International License (CC BY 4.0).

<http://creativecommons.org/licenses/by/4.0/>



Open Access

Abstract

With the beginning of the information systems' spreading, people started thinking about using them for making business decisions. Computer technology solutions, such as the Decision Support System, make the decision-making process less complex and simpler for problem-solving. In order to make a high-quality business decision, managers need to have a great deal of appropriate information. Nonetheless, this complicates the process of making appropriate decisions. In a situation like that, the possibility of using DSS is quite logical. The aim of this paper is to find out the intended use of DSS for medium and large business organizations in USA by applying the Technology Acceptance Model (TAM). Different models were developed in order to understand and predict the use of information systems, but the information systems community mostly used TAM to ensure this issue. The purpose of the research model is to determine the elements of analysis that contribute to these results. The sample for the research consisted of the target group that was supposed to have completed an online questionnaire about the manager's use of DSS in medium and large American companies. The information obtained from the questionnaires was analyzed through the SPSS statistical software. The research has indicated that, this is primarily used due to a significant level of Perceived usefulness and For the Perceived ease of use.

Keywords

Information Technology, Decision Support System, Business Organization in

1. Introduction

There has been significant research on the discipline of decision support systems over the past 35 years [1]. During this period, the research has demonstrated the importance of these systems in addressing both semi-structured and unstructured situation. A study found that users are provided with a number of tools with the aim of increasing their development through their use of Decision Support System users can improve their decision-making, build their cognitive process, and make more rational and logical selections [2]. Although the discipline of Decision Support Systems (DSS) has advanced, use of these systems remains limited. Only a few Decision Support Tools users are academic staff. However, Decision Support Tools are heavily used by functional managers in such fields as logistics and marketing.

Universities have conducted studies in the past to assess the use of Decision Support Systems [3]. One of the most interesting and in-depth fields of management research nowadays is, probably, strategic decision-making. Information technologies are widely and more and more frequently used by managers and business owners in order to make informed strategic decisions [4]-[17]. More and more managers see and acknowledge the importance and potential of the use of such technologies in the process of management. The reasons for the processes of implementing and using information systems for decision-making purposes are to gain a competitive advantage and become more efficient in the business procedures as a part of the business processes activity. DSS incorporates a variety of records and applies an all-encompassing approach to utilizing database-oriented information and analytical models that allow businesses to solve even the most challenging tasks with outstanding precision and speed [18]. Being facilitated by the continuing technological advancements, DSS became an integral part of the organizational structure, which enables businesses to maintain and improve competitive positioning. Perceived usefulness is defined as the extent of the belief of a person in the possibility of a system increasing job performance [19]. At the same time, perceived ease of use is described as the degree of belief of a person in the probability of a specific technology to be free of the required effort. Despite the development and the value of DSS, there is no understanding of the critical factors of DSS usage and adoption in the USA.

This study aims to address this gap by applying the accepted technology model to elaborate on the core DSS acceptance criteria for medium and great business organizations all over the country. In this way, the data and study results gained in online questionnaires and analyzed in SPSS software were aimed to help organizations upgrade their decision-making processes to become more efficient, quick, and smart [14] [20] [21]. The goals of this study were to evaluate

PU as a way to facilitate improvements in decision making and assess the role of PEOU in the intention of a screening system. This study aims to be of great interest to managers or leaders of companies who have made DSS a priority as well as to decision-makers of organizations that consider using DSS to improve their business and managerial performance.

These applications designed are more specified due to their function in assisting in the process of problem-solving and decision-making. The reason for the stability of this definition is the fact that the meaning has been either becoming narrower or broader. At the same time, other simulacra of IT systems addressed different types of problems. DSS is highly reliant on the capabilities of the World Wide Web on its ability to make information available to individuals making decisions. DSS is more employed in making strategic decisions, and now they work much more efficiently from those years, facilitated mainly by the World Wide Web.

IT, machine learning and DSS have been widely used in wealthy countries [22]-[24]. Although DSSs are employed in a variety of ways, their use is expected with medium and large corporate organizations operating in this country. The theoretical framework for this study is the Technology Acceptance Model TAM, which is a model designed by MIT, Sloan School of Management, to test new theoretical ideas of end-products [25]. However, by using a variety of criteria, TAM is responsible for nearly all differences in adopting IS differences in adoption likely to be caused by the relationship between beliefs and the expectation of behaviour.

The impact of external variables on usefulness, perception and ease of use was discovered in those studies by reducing the usefulness and ease of use of the entrant of decision-making systems perceived in terms of use. The modified TAM Money and Turner, 2004 does not study how perceived ease and usefulness equate to each other. There are two main factors associated with this theory. The TAM with its design elements does not take into account the impact of external variables on perceived usefulness or ease of use of DSS and only estimates the true use to be based on perceived usefulness and ease of use.

2. Research Methodology and Hypotheses Developments

In this research, for collecting the data, we distributed an online questionnaire among a specific sample for analyzing the parameters that affect managers' use of Decision Support Systems in medium and large commercial organizations worldwide. Then, we used SPSS V27 statistical software to analyze the data received from the surveys that were conducted. For further establishing our model, a theoretical foundation is developed in the second part. The output results were analyzed based on the hypotheses, the internal consistency of measuring scales, and correlation and regression analysis of the evaluated theoretical constructs. The fundamentals of the technology acceptance model and our developed hypotheses are described below.

2.1. The Technology Acceptance Model

The Technology Acceptance Model, or TAM, may serve as one of the primary theoretical frameworks for understanding and predicting the acceptance and adoption of new technologies. Technology Acceptance Models have been extensively used in many studies to interpret the adoption and acceptance of various technologies. Considering the number of researchers and scholars that rely on TAM, it is evident that the framework is quite popular and essential. In addition, it is an appealing tool due to its simplicity. There are a number of external influences to use Technology Acceptance Model, the framework that analyses and predicts the use of systems based on two factors: perceived usefulness and perceived ease of use. Some of the factors that can change managers' perception on using DSS include preceding use and situation involvement. Moreover, internal computing assistance and external computing training may play a crucial role. Managers' experience with the same thing in the past and their level of education will also affect their perception. Some factors that may impact it may include participation in training and subjective norms. Researchers who examined the influential factors did not make a relationship with TAM. Thus, it is crucial to note that there will be more users and there will be more utility that Decision Support Systems are going to provide. Furthermore, the problem of determining factors that affect the DSS planned use must be addressed. That is why the primary question of the questionnaire addressed to the USA Republic medium-large commercial organisation executives aimed to determine above mentioned constructs. The constructs include Money and Turner's revised Technology Acceptance Model, or TAM. Its interrelationships may be observed in **Figure 1** below.

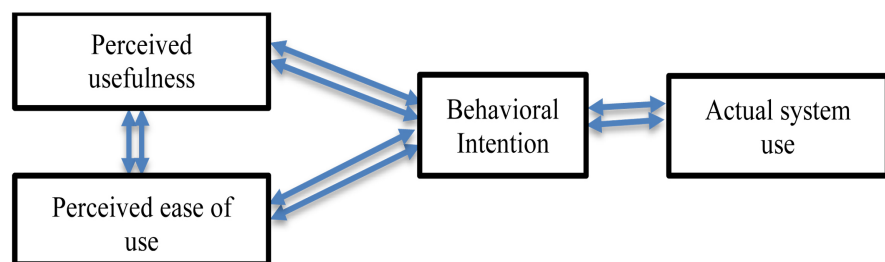


Figure 1. The revised Technology Acceptance Model (TAM) by money and turner [26].

2.2. Perceived Usefulness of DSS (C1)

Perceived usefulness is the primary determinant of technology acceptance and use, especially in the context of DSS. According to the TAM, PU is the degree to which a person believes that using a specific system would augment their job performance [27]. This notion is crucial for understanding why managers decide to implement DSS in their organizational processes. Firstly, it is commonly believed that DSS is useful for managers because, with their help, individuals may significantly enhance the quality of analyzing various types of data used for deci-

sion-making [19]. DSS constitute a critical source of detailed and up-to-date data, the availability of which is indispensable to running a business. Finally, the need for using DSS emerges from the desire of leaders to make the functioning of their organizations more efficient. It occurs by reducing the time spent on routine data processions that require little intellectual effort and are processed by computers. As a result, individuals have more time to concentrate on the most critical aspects of their functions. DSS is perceived as beneficial because it contributes to the creation of a shared platform. The integration of advanced quantitative methods such as forecasting techniques or optimization methods into DSS further contributes to their perceived usefulness due to the greater relevance and accuracy of the results [28]. The importance of these two elements for the perceived usefulness of DSS is supported by the results of various empirical studies [29]. Furthermore, the value of providing insights is likely to increase the perceived usefulness of the problem since the employment of advanced technologies in DSS results in these systems being able to provide more profound insights [18]. Overall, the perceived usefulness of DSS is one of the key drivers of managers' intention to utilize them. As a result, DSS which permit managers to customize the system to their specific needs and expectations are likely to be perceived as more useful than those that do not [30]. The integration of advanced technologies into these systems results in the DSS being perceived as useful, and as a result, the managers are likely to utilize them more often [31].

2.3. Perceived Ease of Use of DSS (C2)

The perceived ease of use credibility of the Technology Acceptance Model is fundamentally known as ease of operation PEOU, reflects the degree to which a person believes that using a particular system will be completely free of effort [32]. Moreover, this element is relevant in terms of Decision Support Systems [19]. More specifically, PEOU is related to managers' willingness to adopt and use DSS. Moreover, these technologies should be well-operated, comprehensible, and free of any difficulties for individuals that are going to use this and similar system. That is why DSS is expected to be created with user-friendly interfaces and heuristic factor that simplify the whole learning process. Generally speaking, perception ease of use reduces the load on users' perception, making DSS relatively easier to navigate. As a result, managers will be able to learn to use this system as soon as possible, increasing their overall productivity and levels of satisfaction. It is obvious that because of the benefits scholars focused attention on the way how PEOU affects DSS [33]. There are some findings, that user's perception of DSS is one of the main key factors that determine its further implementation and use. For example, when DSS becomes too difficult to use, it might be neglected or even ignored by managers. Furthermore, when users perceive DSS being relatively easy, it virtually guarantees that these people will use this and other similar systems frequently [34].

2.4. Behavioural Intention to Use of DSS (C3)

Behavioural intention to use is a user's likelihood or willingness to participate in the particular technology. This construct represents the main concept of the Technology Acceptance Model that is employed to estimate actual system use. With regard to Decision Support Systems (DSS), the use of this construct is related significantly to the use of two important factors influences: perceived usefulness and perceived ease of use [19]. Such use can have different outcomes, but when managers' consideration that DSS improves their job performance, and they perceive the system as easy to use, the probabilities of increasing their intentions to use the source improve as well. A study by discovered that the increasing BI was associated with more frequent and appropriate use of DSS that influenced the improvement of the decision-making process and other organizational outcomes [34]. Moreover, this construct is a-based one, which means that BI is affected by user experience, organizational support, and system quality that enhance user acceptance of DSS. In this way, BI should be considered vital in terms of the DSS use intention [35].

2.5. Actual System Use of DSS (C4)

The concept of actual system use refers to the measure of how users interact with a Decision Support System in the "real world." That is, it provides insights into user practices when engaging with applications in their daily operations and decision-making [19]. Actual system use seems to be the most important factor for determining the system's success. Researchers, beginning with Davis's, have utilized the Technology Acceptance Model to explain actual system use. It has been found that the higher the levels of PU and PEOU, the more BI users there are, which also leads to increased actual system use. Venkatesh et al. discovered that if users are convinced that a DSS can support their daily operations as well as be mastered quickly by them, they are more likely to use it in their performance, thus becoming more productive and making better decisions [36]. In this way, the actual system use helps to realize the intended benefits of DSS, as it guarantees that managers use it at the level to which the technology was designed for them to make both operational and strategic decisions [37].

3. Research Results

3.1. Research Hypothesis

In order to use the potential support of DSS in the decision-making process of the entire management in USA, Rigopoulos used a fundamentally comparable approach as part of our model. On the basis of the demonstrated TAM model and the theoretical framework of Chapter 2, we then developed the following research hypotheses.

H1: There exists a positive relationship between DSS perceived utility and simplicity of use.

H2: There is a positive relationship between peoples' behavioural intention to

use the DSS and the perceived utility and simplicity of its use.

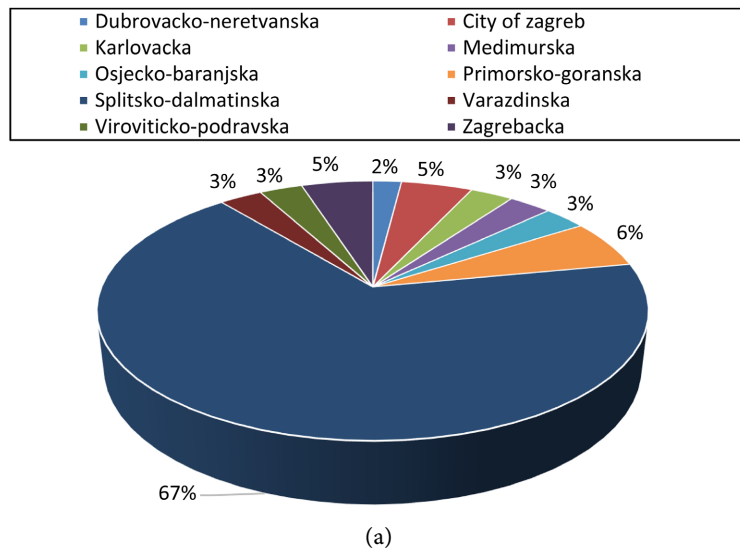
H3: There exists a positive relationship between the perceived utility of DSS use and perceived simplicity of its use on one side, and actual use of DSS use by respondents on the other.

H4: There will be a positive relationship between behavioural intention and actual use of DSS. The main goal of this study is to determine on the basis of which variables the owners and managers of medium and large companies in USA decide to use or not use DSS. We then provided the target sample with an online questionnaire in order to verify the hypotheses. The results of the internal consistency of the measurement scales are presented after the thesis paper, demonstrating the correlation analysis of the examined theoretical constructs alongside the results of the research in question.

3.2. Application of Research

One segment of the research dealt with DSS’s potential in medium-sized and large commercial organizations. During the data collection phase of the survey, sample allocation on territorial subdivisions of the Republic of USA is illustrated in a pie chart shown in **Figure 2(a)**. The research was carried out on a sample of 156 business organizations from different branches of industry located in ten different geographical areas, as shown in **Figure 2(b)** below. 45% of the business organizations had over 251 people employed. The survey was sent to several management departments. However, on average, it was completed by owners 23% and CEOs 20%. The standard five-point Likert scale was employed in this survey with the following grading:

- I strongly disagree.
- On the contrary.
- There is no agreement or disagreement.
- I accept.
- I completely concur.



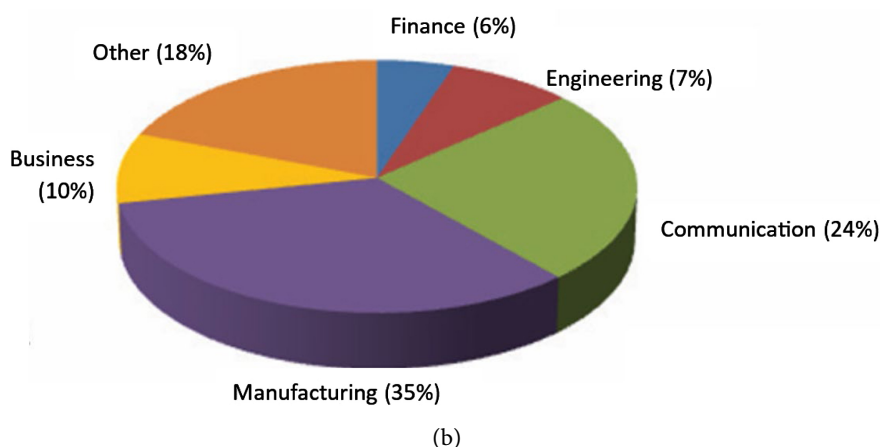


Figure 2. (a). Sample allocation on territorial subdivisions of the Republic of USA [22]. (b). Industries of the research sample [22].

In the process of surveying the actual usage on DSS, the following statements are used:

- 1) Approximately I use the DSS in my work.
- 2) I always use DSS in my job.
- 3) Definitely, my work job uses DSS and it is impossible to separate it.

Table 1 shows the descriptive statistics for the obtained results. The business organizations surveyed show the highest mean values for both the DSS use intention and perception of DSS usefulness. Actual DSS use has the lowest mean values.

Table 1. Statistical description of the theoretical stands for the amount of statements within a single construct, and S mean and Std. deviation.

	S	Minimum	Maximum	Mean	Std. Deviation
C1	8	1.87	5.05	3.4513	0.78435
C2	7	1.98	5.05	3.2134	0.65342
C3	7	1.94	5.05	3.5432	0.74654
C4	3	1.05	5.05	3.2123	0.87965

3.3. Cronbach's Alpha Test

Internal consistency is a widely applied metric in statistical analysis; it informs on whether several hypotheses that the same construct constitutes will produce similar results. It is based on the correlation between various items of the same construct. Normally, to get an exact alpha value for internal consistency, practitioners utilize the Cronbach's alpha test instrument. The statistics count regarding the correlation between items; the values will range between zero and one. According to widely acknowledged standards, such a number is satisfactory. Reliability is extremely good if the value amounts to 0.8 and above. However, as high reliability suggests that some items in terms of the same construct are entirely redundant, 0.95 and above is not always good. **Table 2** displays the

Cronbach alpha values of our test results, indicating that test reliability is satisfactory. To precisely answer the research question via a reliable measuring instrument that will provide relevant statistics, a researcher needs to ensure that each item constituting the construct may always be internally consistent, inter-rater consistent, and that all separate distinct instruments should be highly relevant.

Table 2. Cronbach’s alpha test results.

	S	Cronbach’s alpha test
C1	8	0.941
C2	7	0.921
C3	7	0.929
C4	3	0.874

3.4. Tested Model: Correlation Analysis

We performed a correlation analysis using the total scores of measuring scales. The correlation analysis showed that there is a significant positive correlation between the following constructs as shown in **Table 3**.

Perceived usefulness of a DSS $\rho = 0.564^{**}$.

Perceived usefulness, Perceived ease of use, Behavioural intention to use DSS $\rho = 0.580^{**}$.

Perceived usefulness, Perceived simplicity of use, Actual use of DSS $\rho = 0.896^{**}$.

Actual use of DSS, behavioural intention to use DSS $\rho = 0.955^{**}$.

In order to establish a clear relationship between the factors and the behavioural intention, the current study generated two Pearson correlation models. **Figure 3** and **Figure 4** depict these models together with their corresponding test results.

Table 3. Pearson’s correlation matrix for the theoretical constructs.

		C1	C2	C3	C4
C1	Pearson Correlation Sig.	1	0.721	0.923	0.579
	(2-tailed) N		0.000	0.000	0.000
		155	155	155	155
C2	Pearson Correlation Sig.	0.711	1	0.767	0.799
	(2-tailed) N	0.000		0.000	0.000
		155	155	155	155
C3	Pearson Correlation Sig.	0.933	0.778	1	0.732
	(2-tailed) N	0.000	0.000		0.000
		155	155	155	155
C4	Pearson Correlation Sig.	0.580	0.791	0.735	1
	(2-tailed) N	0.000	0.000	0.000	
		155	155	155	155

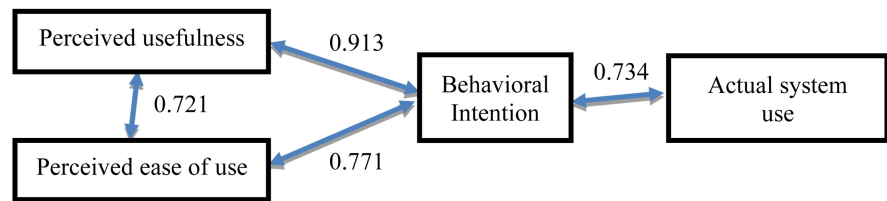


Figure 3. Pearson correlation model 1.

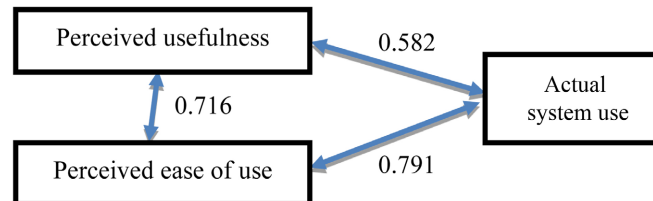


Figure 4. Pearson correlation model 2.

3.5. Regression Analysis of the Tested Hypothetical Model

For the regression analysis, we divided the aspects of the theoretical model to tests as sub-models. We conducted regression analysis based on measurement scale gross data. The following are the four sub-models, and the R^2 for regression analysis inscriptions, and their standard beta coefficients:

1) R^2 Regression analysis

Relationship between perceived utility of the DSS, and simplicity of use is = DSS is 0.505.

Beta coefficient and standard error = 0.716.

2) Relationship between behavioural intention to use ($R^2 = 0.872$), perceived usefulness (beta = 0.766) and perceived ease of use (beta = 0.234) off DS (beta = 0.716).

3) The models represent the dependent variable variance share by using the coefficient of multiple determination. or R-square, which correlates the behavioural intention to use DSS to = 0.632. The regression coefficient, or beta, is the average change in the dependent variable that occurs when the independent variable increases by one.

The regression analysis, overall, was consistent with the correlational analysis of the same and seemingly showed the same result. More clearly, the regression analysis independently found that the proposed utility, perceived ease of use, as well as perceived utility, and perceived ease of use correlations were statistically significant. An examination of the t-distribution in the tests for significance of the beta coefficient also seemingly confirmed all the significance that the proposed correlations were not due to chance, as evidenced from the P values of the t values for the beta coefficients shockingly being non-0.

4. Discussion

From this study, perceived ease of use may be of more importance to system acceptance than perceived usefulness. A research study completed by Brown and

his associates in 2002, for example, replicated TAM in the banking sector and reached exactly the same conclusion. This conclusion also provides that during the process of DSS system implementation, different stages are required to be catered for and have differing impacts on each other. From this, one can also comprehend that while the majority of the outcomes are unanimous with the previous research results, a few cases also have been contradictory.

“In general, the TAM has proven to be a very effective model for explaining and predicting system use.” It has been proven by its numerous concurrent and across-time studies. The effectiveness of the improvement process is carried by the same three dependencies: technology, the change model, and organizational context. It will be impossible to improve on the predictive power of TAM if it is not part of a larger model that incorporates organizational and social frameworks. It was additionally also observed that the management style of an efficient IS implementation, for example, usually does not rely on an improvement-seeking pattern but rather on a pattern of sporadic storms of implementation. Although many studies have been conducted in this context, the novelty of this study lies in the influential factors considered. No study has previously considered these factors to predict the behavioural intention to adopt DSS in IT sectors.

5. Conclusions

This study used a revised TAM model to assess how the end-users’ perception of the DSS utility and simplicity of use impact the users’ behavioural intention and actual use of the DSS. The contribution of the research paper is valuable for the DSS area, as it looks into users’ intention to accept and use DSS for use in the process of decision making. The fact that the study was conducted in a business environment only adds to its benefit. When the list of hypotheses that the authors of the original study that was used in the thesis claimed that the list of hypotheses is above, the key result is that all examined hypotheses revealed favourable correlations. Specifically, the following hypotheses were examined:

- A positive correlation occurs between DSS perceived utility and simplicity of use.
- The perceived utility and simplicity of DSS use correlate positively with the behavioural intention to use it.
- A positive correlation exists between the perceived utility and perceived simplicity of user of DSS and their actual use.
- There is a favourable correlation between behavioural intention to use DSS and actual DSS use.

The subsidiary in question employed a utility concept, however, the analysis of actual system use of this research shows the exact opposite: it was the utilisation of this DSS by current users who eventually found that the importance of perceiving it as an easy system to use exceeded that of their job. This can be attributed to the fact that a user who already uses the system and views it as being

of no additional benefit to their work is still compelled to use it by the company that owns it and will employ it to them. The output of this analysis is not only helpful for the IT sectors but also can give a clear direction to adopt DSS in other sectors such as manufacturing, research, education, production as well as business operations. In conclusion, it can be stated that the presented data point towards a collapsing of the majority of the stages and patterns which will be important for the future analysis of the DSS implementation.

Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

References

- [1] Arnott, D. and Pervan, G. (2008) Eight Key Issues for the Decision Support Systems Discipline. *Decision Support Systems*, **44**, 657-672.
<https://doi.org/10.1016/j.dss.2007.09.003>
- [2] Mackrell, D., Kerr, D. and von Hellens, L. (2009) A Qualitative Case Study of the Adoption and Use of an Agricultural Decision Support System in the Australian Cotton Industry: The Socio-Technical View. *Decision Support Systems*, **47**, 143-153.
<https://doi.org/10.1016/j.dss.2009.02.004>
- [3] Al-Rahmi, A.M., *et al.* (2019) Evaluating the Intended Use of Decision Support System (DSS) via Academic Staff: An Applying Technology Acceptance Model (TAM). *International Journal of Engineering and Advanced Technology*, **8**, 565-571.
- [4] Khan, M., Sobuz, M. and Kabbo, M. (2023) Hardened and Microstructural Characteristics of a Biochar-Cement Mortar Composite. *Proceedings of International Conference on Planning, Architecture and Civil Engineering*, 12-14 October 2023, Rajshahi.
- [5] Hasan, R., Al Mahmud, M.A., Farabi, S.F., Akter, J. and Johora, F.T. (2024) Unsheltered: Navigating California's Homelessness Crisis. *Sociology Study*, **14**, 143-156.
<https://doi.org/10.17265/2159-5526/2024.03.002>
- [6] Hasan, R., Chy, M.A.R., Johora, F.T., Ullah, M.W. and Saju, M.A.B. (2024) Driving Growth: The Integral Role of Small Businesses in the U.S. Economic Landscape. *American Journal of Industrial and Business Management*, **14**, 852-868.
<https://doi.org/10.4236/ajibm.2024.146043>
- [7] Hasan, R., Farabi, S.F., Kamruzzaman, M., Bhuyan, M.K., Nilima, S.I. and Shahana, A. (2024) AI-Driven Strategies for Reducing Deforestation. *The American Journal of Engineering and Technology*, **6**, 6-20.
<https://doi.org/10.37547/tajet/volume06issue06-02>
- [8] Johora, F.T., Hasan, R., Farabi, S.F., Akter, J. and Mahmud, M.A.A. (2024) AI-Powered Fraud Detection in Banking: Safeguarding Financial Transactions. *The American Journal of Management and Economics Innovations*, **6**, 8-22.
<https://doi.org/10.37547/tajmei/volume06issue06-02>
- [9] Al Mahmud, M.A., Hossain, M.A., *et al.* (2024) Information Technology for the Next Future World: Adoption of It for Social and Economic Growth: Part II. *International Journal of Innovative Research in Technology*, **10**, 742-747.
- [10] Mohammad, N., Imran, M.A.U., Prabha, M., Sharmin, S. and Khatoun, R. (2024) Combating Banking Fraud with It: Integrating Machine Learning and Data Analyt-

- ics. *The American Journal of Management and Economics Innovations*, **6**, 39-56.
<https://doi.org/10.37547/tajmei/volume06issue07-04>
- [11] Hasan, R., Farabi, S.F., Al Mahmud, M.A., *et al.* (2024) Information Technologies for the Next Future World: Implications, Impacts and Barriers: Part I. *International Journal of Creative Research Thoughts*, **12**, a323-a330.
- [12] Shahana, A., Hasan, R., Farabi, S.F., Akter, J., Mahmud, M.A.A., Johora, F.T., *et al.* (2024) AI-Driven Cybersecurity: Balancing Advancements and Safeguards. *Journal of Computer Science and Technology Studies*, **6**, 76-85.
<https://doi.org/10.32996/jcsts.2024.6.2.9>
- [13] Zaman, A.A.U., Abdelaty, A. and Sobuz, M.H.R. (2024) Integration of BIM Data and Real-Time Game Engine Applications: Case Studies in Construction Safety Management. *Journal of Information Technology in Construction*, **29**, 117-140.
<https://doi.org/10.36680/j.itcon.2024.007>
- [14] Habibur Rahman Sobuz, M., Khan, M.H., Kawsarul Islam Kabbo, M., Alhamami, A.H., Aditto, F.S., Saziduzzaman Sajib, M., *et al.* (2024) Assessment of Mechanical Properties with Machine Learning Modeling and Durability, and Microstructural Characteristics of a Biochar-Cement Mortar Composite. *Construction and Building Materials*, **411**, Article 134281. <https://doi.org/10.1016/j.conbuildmat.2023.134281>
- [15] Jabin, J.A., Khondoker, M.T.H., Sobuz, M.H.R. and Aditto, F.S. (2024) High-Temperature Effect on the Mechanical Behavior of Recycled Fiber-Reinforced Concrete Containing Volcanic Pumice Powder: An Experimental Assessment Combined with Machine Learning (ML)-Based Prediction. *Construction and Building Materials*, **418**, Article 135362.
<https://doi.org/10.1016/j.conbuildmat.2024.135362>
- [16] Sobuz, M.H.R., Al-Imran,, Datta, S.D., Jabin, J.A., Aditto, F.S., Sadiqul Hasan, N.M., *et al.* (2024) Assessing the Influence of Sugarcane Bagasse Ash for the Production of Eco-Friendly Concrete: Experimental and Machine Learning Approaches. *Case Studies in Construction Materials*, **20**, e02839.
<https://doi.org/10.1016/j.cscm.2023.e02839>
- [17] Saha, S., Ghimire, A., Manik, M.M.T.G., Tiwari, A. and Imran, M.A.U. (2024) Exploring Benefits, Overcoming Challenges, and Shaping Future Trends of Artificial Intelligence Application in Agricultural Industry. *The American Journal of Agriculture and Biomedical Engineering*, **6**, 11-27.
<https://doi.org/10.37547/tajabe/volume06issue07-03>
- [18] Power, D.J. (2002) *Decision Support Systems: Concepts and Resources for Managers*. Quorum Books Westport.
- [19] Davis, F.D. (1989) Perceived Usefulness, Perceived Ease of Use, and User Acceptance of Information Technology. *MIS Quarterly*, **13**, 319-340.
<https://doi.org/10.2307/249008>
- [20] Meraz, M.M., Mim, N.J., Mehedi, M.T., Bhattacharya, B., Aftab, M.R., Billah, M.M., *et al.* (2023) Self-Healing Concrete: Fabrication, Advancement, and Effectiveness for Long-Term Integrity of Concrete Infrastructures. *Alexandria Engineering Journal*, **73**, 665-694. <https://doi.org/10.1016/j.aej.2023.05.008>
- [21] Akid, A.S.M., Wasiew, Q.A., Sobuz, M.H.R., Rahman, T. and Tam, V.W. (2020) Flexural Behavior of Corroded Reinforced Concrete Beam Strengthened with Jute Fiber Reinforced Polymer. *Advances in Structural Engineering*, **24**, 1269-1282.
<https://doi.org/10.1177/1369433220974783>
- [22] Aditto, F.S., Sobuz, M.H.R., Saha, A., Jabin, J.A., Kabbo, M.K.I., Hasan, N.M.S., *et al.* (2023) Fresh, Mechanical and Microstructural Behaviour of High-Strength

- Self-Compacting Concrete Using Supplementary Cementitious Materials. *Case Studies in Construction Materials*, **19**, e02395. <https://doi.org/10.1016/j.cscm.2023.e02395>
- [23] Kabbo, M., Sobuz, M. and Khan, M. (2023) Combined Influence of Waste Marble Powder and Silica Fume on the Mechanical Properties of Structural Cellular Lightweight Concrete.
- [24] Habibur Rahman Sobuz, M., Khan, M.H., Kawsarul Islam Kabbo, M., Alhamami, A.H., Aditto, F.S., Saziduzzaman Sajib, M., et al. (2024) Assessment of Mechanical Properties with Machine Learning Modeling and Durability, and Microstructural Characteristics of a Biochar-Cement Mortar Composite. *Construction and Building Materials*, **411**, Article 134281. <https://doi.org/10.1016/j.conbuildmat.2023.134281>
- [25] Dulcic, Z., Pavlic, D. and Silic, I. (2012) Evaluating the Intended Use of Decision Support System (DSS) by Applying Technology Acceptance Model (TAM) in Business Organizations in Croatia. *Procedia—Social and Behavioral Sciences*, **58**, 1565-1575. <https://doi.org/10.1016/j.sbspro.2012.09.1143>
- [26] Money, W. and Turner, A. (2004). Application of the Technology Acceptance Model to a Knowledge Management System. *37th Annual Hawaii International Conference on System Sciences*, Big Island, 5-8 January 2004, 9. <https://doi.org/10.1109/hicss.2004.1265573>
- [27] Arnott, D. and Pervan, G. (2005) A Critical Analysis of Decision Support Systems Research. *Journal of Information Technology*, **20**, 67-87. <https://doi.org/10.1057/palgrave.jit.2000035>
- [28] Turban, E. (2011) Decision Support and Business Intelligence Systems. Pearson Education India.
- [29] Mir, S.A. and Quadri, S.M.K. (2009) Decision Support Systems: Concepts, Progress and Issues—A Review. In: Lichtfouse, E., Ed., *Climate Change, Intercropping, Pest Control and Beneficial Microorganisms*, Springer Netherlands, 373-399. https://doi.org/10.1007/978-90-481-2716-0_13
- [30] Shim, J.P., Warkentin, M., Courtney, J.F., Power, D.J., Sharda, R. and Carlsson, C. (2002) Past, Present, and Future of Decision Support Technology. *Decision Support Systems*, **33**, 111-126. [https://doi.org/10.1016/s0167-9236\(01\)00139-7](https://doi.org/10.1016/s0167-9236(01)00139-7)
- [31] Rai, A., Lang, S.S. and Welker, R.B. (2002) Assessing the Validity of IS Success Models: An Empirical Test and Theoretical Analysis. *Information Systems Research*, **13**, 50-69. <https://doi.org/10.1287/isre.13.1.50.96>
- [32] Agarwal, R. and Prasad, J. (1999) Are Individual Differences Germane to the Acceptance of New Information Technologies? *Decision Sciences*, **30**, 361-391. <https://doi.org/10.1111/j.1540-5915.1999.tb01614.x>
- [33] Gefen, D. and Straub, D. (2000) The Relative Importance of Perceived Ease of Use in IS Adoption: A Study of E-Commerce Adoption. *Journal of the Association for Information Systems*, **1**, 1-30. <https://doi.org/10.17705/1jais.00008>
- [34] Venkatesh, V. and Bala, H. (2008) Technology Acceptance Model 3 and a Research Agenda on Interventions. *Decision Sciences*, **39**, 273-315. <https://doi.org/10.1111/j.1540-5915.2008.00192.x>
- [35] Mathieson, K. (1991) Predicting User Intentions: Comparing the Technology Acceptance Model with the Theory of Planned Behavior. *Information Systems Research*, **2**, 173-191. <https://doi.org/10.1287/isre.2.3.173>
- [36] Venkatesh, V., Morris, M.G., Davis, G.B. and Davis, F.D. (2003) User Acceptance of Information Technology: Toward a Unified View. *MIS Quarterly*, **27**, 425-478.

<https://doi.org/10.2307/30036540>

- [37] DeLone, W.H. and McLean, E.R. (2003) The DeLone and McLean Model of Information Systems Success: A Ten-Year Update. *Journal of Management Information Systems*, **19**, 9-30.