

Mediating Role of User Satisfaction in the Relationship between E-Procurement Usage and Contractors' Performance in the Malaysian Construction Industry

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Abstract

This study is to investigate the role of user satisfaction as a mediating construct of the impact of e-procurement usage on contractors' performance in the Malaysian construction industry. The research is a quantitative method, and questionnaires were used and distributed to contractors from G4 and G5 classifications in Malaysia Construction Industry during the workshops organized by Construction Industry Development Board (CIDB). After data of the 250 contractors were analyzed using AMOS 23, the finding shows that the direct effect of e-procurement usage on performance was not significant. Instead, the indirect effects via User Satisfaction were significant. In other words, User Satisfaction is important for practitioners to achieve Performance Impact.

Keywords: E-Procurement Usage, Performance Impact, User Satisfaction, Malaysian Construction Industry

Introduction

In this study, the relationship between exogenous construct of e-procurement usage; mediating construct of user satisfaction; and endogenous construct, namely Performance impact will be examined, which has been designed by researcher guided by the few theories of Information System. The research is a quantitative method, and questionnaires were used and distributed to contractors from G4 and G5 classifications in Malaysia Construction Industry during the workshops organized by Construction Industry Development Board (CIDB). Generally, the main objective of this study is to investigate the role of user satisfaction as a mediating construct on the impact of e-procurement usage on contractors' performance in the Malaysian construction industry. In short, this study attempts:

- To determine the impacts of e-Procurement Usage on User Satisfaction and Performance Impact on contractors' performance in the Malaysian construction industry
- To determine the mediating role of User Satisfaction in the relationship between E-Procurement Usage and Performance Impact on contractors' performance in the Malaysian construction industry

Literature

There are many researchers that had studied on the three variables of technology usage, user satisfaction and performance impact. Refer simply to the reference number, as in Osama et al., (2017); Sharma and Lijuan, (2015); McHaney, Chilton and Thomson, (2012).

Research by Osama et al., (2017) has been done towards 530 internet users among employees within all 30 government ministries-institutions in Yemen, where questionnaire survey method is used to collect primary data. The result shows that actual usage has a strong positive impact on user satisfaction, and performance impact. Second, user satisfaction has a great influence on the performance impact. Third, user satisfaction mediates the relationship between the actual usage and performance impact.

Another research by Sharma and Lijuan (2015), investigates service quality of e-commerce Web sites in an online platform and their contribution to e-business promotion. The online survey was performed on a survey portal provided by Nepal Telecom in Nepal. The findings of the study suggest that information quality and online service quality were the key determinants for user satisfaction and sustainability of e-commerce technology. Therefore, the results can be applied for e-commerce Website operators that wish to enhance the competitiveness of their websites in the highly competitive online market.

An investigation of computer and related technology use in 266 Midwestern veterinary clinics has been done and the primary purpose of the study is to assess technology use within veterinary clinics and understand which technologies lead to greater perceived levels of end-user computing satisfaction and technology acceptance (McHaney, Chilton and Thomson, 2012). The study indicates most veterinarians feel office automation is necessary for the pursuit of their profession, but realize it is only one tool in a set of tools employed to accomplish the goal of helping animals and bringing peace of mind to their owners. The findings also indicate that most practitioners do rely on this technology to help them manage their practices and that they are largely satisfied with it.

Thus, literature has proved user satisfaction relates usage and performance. The researcher predicts that contractors would satisfy after they had used e-procurement and would positively influence performance.

Methods

This study focuses on exploring the extent of contractors' actual usage (acceptance) of e-procurement technology and its effect on contractors' performance. A cross-sectional field study using a questionnaire survey method will be conducted to collect the data. This field study is also called one-shot study and is done when data is gathered just once over a period such as days, weeks, or months to answer a research question. The questionnaire survey method will be used because it seeks information on what the respondents did in the past,

what they are doing now and their viewpoints on factors involved in the subject. Since this study is targeted to the Malaysian middle size contractors, the questionnaire survey method is considered appropriate. The survey questionnaire for this study is adapted from other several prior studies with the appropriate refinements and modifications to collaborate with this research.

Results and Discussion

Table 1

Demographic Information

Gender		Education level	
Male	68%	Certificate	50.4%
Female	32%	Diploma	10.4%
Age		Degree	30%
21 – 30	6.4%	Master	9.2%
31 – 40	39.6%	Position level	
41 – 50	33.2%	General manager	23.6%
51 – above	20.8%	Engineer	26.8%
Race		Site manager	26%
Malay	39.2%	Executive	23.6%
Chinese	25.6%		
Indian	24.4%		
Others	10.8%		

Table 1 shows the demographic background of respondents of the research. The respondents showed a lot of variation in age, ranging from 20 to more than 51 years old. About 6.4 percent of the respondents come from 20 to 29 years age group, and 20.8 percent of the respondents come from the 51 – above age group. Most of the respondents come from the 31 to 40 years age group (39.6 percent). The remaining 33.2 percent of respondents are from the 41 to 50 age group. Age is another demographic variable in which the respondents showed considerable variation. Most of the respondents are Malay (39.2 percent). This is followed by 25.6 percent Chinese and 24.4 percent Indian. The remaining 10.8 percent are others. The respondents are differed with regards to the education background. Holders of certificate comprised of the largest group, accounting for 50.4 percent, followed by the degree holders who accounted for 30 percent, and diploma holders' 10.4 percent. Approximately 9.2 percent of the respondents came from master's degree. The respondents also differed in terms of job designation. Most of the respondents are engineers (26.8 percent) and site manager (26 percent), followed by the general manager (23.6 percent) and executive (23.6 percent).

Data Analysis & Findings

To test the hypotheses, a structural equation modeling procedure was performed utilizing IBM SPSS AMOS 23.0. Structural equation modelling (SEM) has accompanying points of interest; to start with, it can appraise connections among latent constructs demonstrated by indicator variables. Second, it can consider correlations among measurement errors. Third, it can measure the recursive connection between constructs. The standardized regression path

coefficient is presented in Figure 1 while the regression path coefficient is presented in Figure 2.

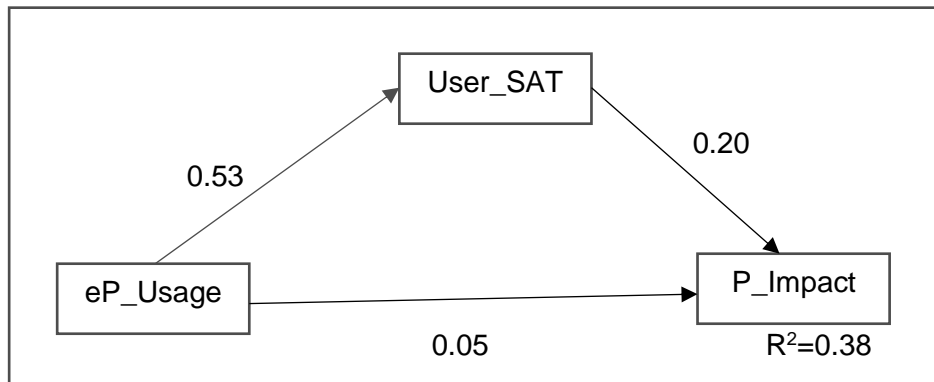


Figure 1: The Standardized Regression Path Coefficient

The explanation regarding the performance of R² (coefficient of multiple determination) of the model that has been shown in Figure 1 explained in Table 2.

Table 2

The Coefficient of Multiple Determination or R2 and its implication in this study

Endogenous Construct	R ²	Conclusion
Performance Impact	0.38	The two constructs, namely e-Procurement usage and User Satisfaction, manage to estimate about 38 percent of Performance Impact

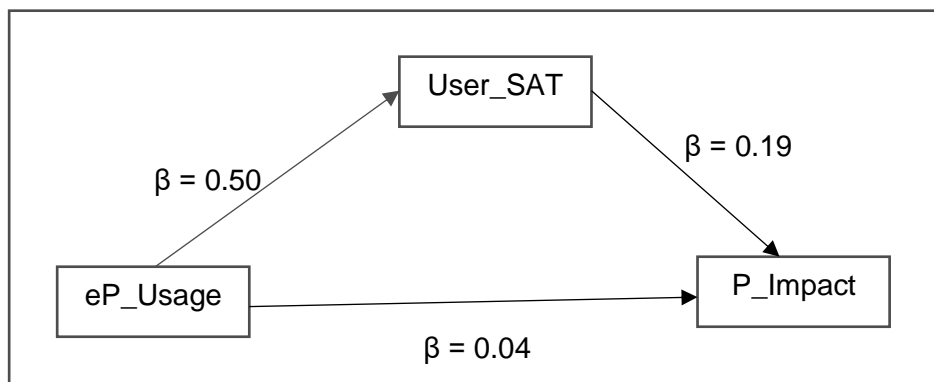


Figure 2: The Regression Path Coefficient

The text output of the regression path coefficient (beta) is shown in Figure 2, reflecting the effects of exogenous constructs on the endogenous construct, as presented in Table 3

Table 3

The Regression Path Coefficient and its Significance

Construct	Path	Construct	β	S.E.	C.R.	P-value	Result
User_Satisfaction	<---	eP_Usage	0.503	0.052	9.739	0.001	Significant
P_impact	<---	User_satisfaction	0.187	0.054	3.470	0.001	Significant
P_impact	<---	eP_usage	0.040	0.043	0.945	0.345	Not Significant

The above table 3 shows that e-procurement usage has a significant effect on user satisfaction. User satisfaction also has significant effect on performance impact. However, e-procurement usage does not have a significant effect on performance impact. The results in Table 3 are used for testing the mediator effect analysis.

Testing the Mediation Effect of User Satisfaction

Research Hypotheses: User satisfaction mediates the relationship between e-procurement usage and performance impact.

The purpose of the hypothesis is to prove that user satisfaction mediates the relationship between e-procurement usage and performance impact. The procedure for testing the mediator is simplified in Figure 3.

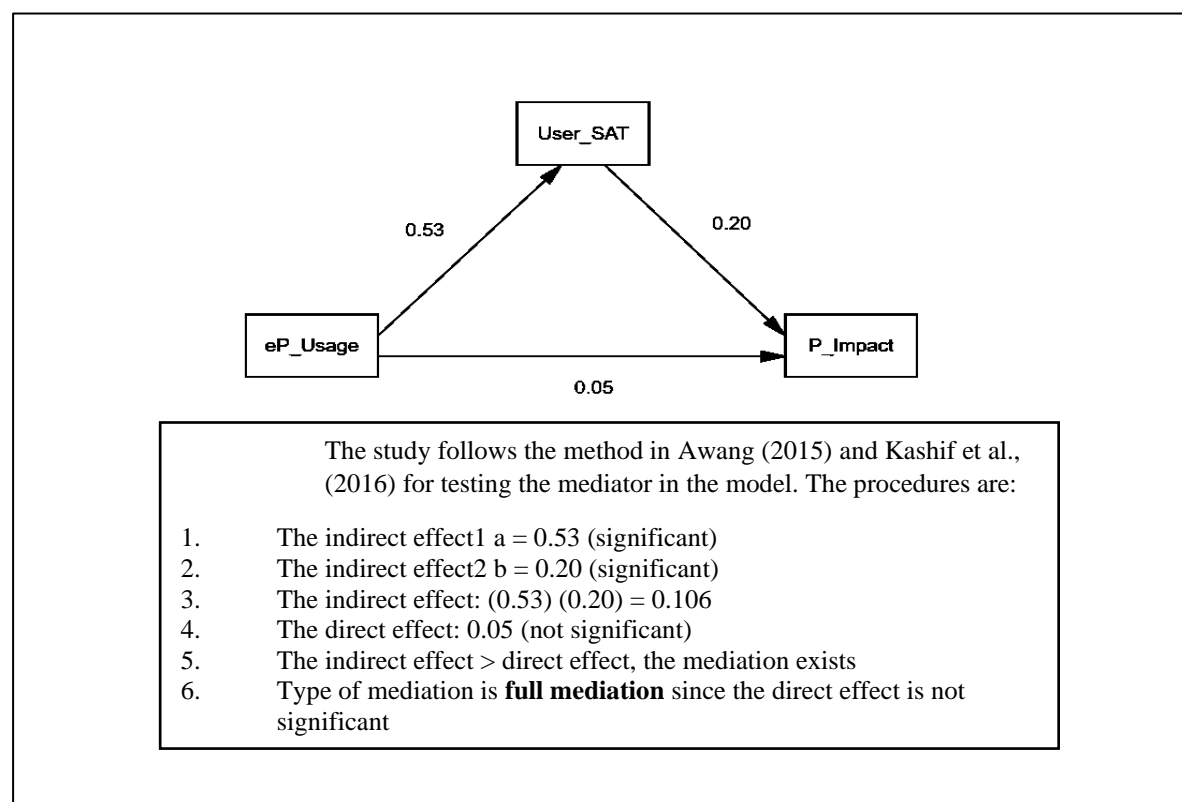


Figure 3: The Procedure for Mediation Analysis

Figure 3 shows that user satisfaction mediates the relationship between e-procurement usage and performance impact. The study follows the method in Awang (2015) and Kashif et al., (2016) for testing the mediator in the model. The direct effect of e-procurement usage towards performance impact is 0.05 ($r = 0.05$). On the other hand, the indirect effect of e-procurement towards performance impact through the mediator of user satisfaction is calculated as a correlation of e-procurement usage towards user satisfaction multiply with a correlation of user satisfaction towards performance impact. Thus, indirect effect: $(0.53) \times (0.20) = 0.106$. Mediation effect exists because the indirect effect is bigger than the direct effect. For this case, full mediation occurs since the direct effect is not significant.

The bootstrapping procedure to reconfirm the hypothesis testing in Figure 3 is presented in Table 4. The study employed the Maximum Likelihood bootstrapping procedure using 1000 bootstrap samples with both percentile confidence intervals, and biased-corrected confidence intervals are set at 0.95. The bootstrapping results for mediation test are consistent with the earlier hypothesis testing result. Thus, it confirms that user satisfaction mediates the relationship between e-procurement usage and performance impact.

Table 4

The Bootstrapping Procedure to Confirm the Mediation Test in Figure 3

	Indirect Effect	Direct Effect
Bootstrapping Results	0.348	0.046
Bootstrapping P-Value	0.002	0.330
Result	Significant	Not Significant
Type of Mediation	Full Mediation occurs since the direct effect is not significant	

Conclusion

All the three constructs involved have achieved validity and reliability, as reported on CFA findings by Elias et al., (2022), before proceeding to the measurement of relationship and mediation as discussed in this paper.

The empirical analysis of this research contributed to knowledge in e-procurement adoption research especially on the direct effect of e-procurement usage on performance which was not significant. The direct effect of e-procurement usage on performance was not significant may be due to the problems in the e-procurement system such as issue of accountability, transparency, corruption, integrity, and cronyism happen in construction industry, especially during the implementation of e-procurement. Instead, the indirect effects via User Satisfaction are significant. In other words, User Satisfaction is important for practitioners to achieve Performance Impact. This finding is consistent with the results of other studies by Osama et al., (2017) and Zaied (2012), which also confirmed that user satisfaction has a significant influence on performance. The findings of this study are important to all government sectors and contractors as well to know the real situation happen.

Research Contribution

Theoretical Contribution

This study makes significant theoretical contributions to the existing literature on e-procurement, user satisfaction, and contractor performance in the construction industry. Specifically, it extends the understanding of how e-procurement adoption influences contractor performance by introducing user satisfaction as a mediating variable. Prior research on e-procurement has predominantly focused on its direct impact on performance outcomes. However, this study demonstrates that the effect of e-procurement usage on contractor performance is not direct but is rather mediated through user satisfaction.

This theoretical insight is crucial because it challenges the conventional wisdom that technology adoption leads to immediate performance improvements. By emphasizing the mediating role of user satisfaction, the study contributes to the literature by showing that for e-procurement to have a significant impact on performance, contractors must first be satisfied with the system's usability and effectiveness. This shifts the focus from merely adopting e-procurement systems to understanding how the satisfaction of users with these systems influences their performance outcomes.

Furthermore, this research contributes to the Technology Acceptance Model (TAM) by suggesting that satisfaction with e-procurement systems may play a pivotal role in determining the success of such systems in the construction sector. By identifying user satisfaction as a key construct, this study enhances the conceptualization of the factors that affect technology adoption and performance.

Contextual Contribution

Contextually, this study offers valuable insights into the Malaysian construction industry, where e-procurement is becoming increasingly prevalent but not always yielding the expected performance gains. The Malaysian context, particularly focusing on contractors from G4 and G5 classifications, adds depth to the discussion of how technology adoption can vary across different levels of the construction industry. The findings underscore the importance of ensuring that users are satisfied with e-procurement systems before expecting substantial improvements in performance.

The research is also grounded in the specific context of workshops organized by the Construction Industry Development Board (CIDB), an influential body in the Malaysian construction sector. By collecting data from contractors who actively engage in industry-specific development activities, the study provides practical insights into how e-procurement systems are utilized in real-world settings. This contextual contribution is particularly valuable for policymakers and practitioners in the Malaysian construction industry, as it highlights the need for user satisfaction initiatives and support to ensure the successful implementation of e-procurement technologies.

Additionally, the findings could inform future initiatives by CIDB and other industry bodies to tailor e-procurement training and implementation strategies that prioritize user satisfaction, which, in turn, may lead to more meaningful improvements in contractor performance. This contextual understanding is essential for making informed decisions about the design and

deployment of e-procurement systems in construction projects, particularly in the Malaysian setting.

In summary, this study contributes both theoretically and contextually by highlighting the mediating role of user satisfaction in the relationship between e-procurement usage and contractor performance, with a specific focus on the Malaysian construction industry.

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