

THE ELECTRONIC PROCUREMENT INITIATION AND ADOPTION IN THE  
CONSTRUCTION INDUSTRY

By

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# **PERMULAAN DAN PENERIMAAN PEMEROLEHAN ELETRONIK DI DALAM INDUSTRI PEMBINAAN.**

## **ABSTRAK**

Penyelidikan ini bertujuan mengenal pasti faktor-faktor penting yang memberi kesan terhadap pengenalan dan penerimaan pemerolehan elektronik (electronic procurement, EP) dalam industri pembinaan Malaysia. Suatu kajian eksplanatori berjujukan kaedah-bercampur digunakan untuk mengenal pasti faktor tersebut dalam empat kumpulan pembinaan, iaitu klien, kontraktor, perunding / konsultan, dan pembekal.

Dalam kajian kuantitatif, tumpuan diberikan terhadap pengenalpastian faktor-faktor penting yang memberi kesan terhadap pengenalan dan penerimaan EP dalam industri pembinaan Malaysia. Analisis faktor eksploratori (exploratory factor analysis, EFA) digunakan untuk mengenal pasti faktor tersebut, yang dikelompok berdasarkan keterkaitannya.

Data dikumpul secara pos dan sistem kajian berdasarkan sesawang (web-based survey systems) (N=528). Kadar respons keseluruhan adalah 54.15% dan data dianalisis dengan menggunakan statistik deskriptif, ANOVA, dan EFA.

Melalui penggunaan EPA, enam faktor ditemui dalam dua fasa yang berbeza (fasa pengenalan dan fasa penerimaan). Dua faktor ditemui dalam fasa pengenalan tahap kematangan teknologi maklumat (information technology, IT) dan kesedaran tentang pemerolehan inovasi. Sementara itu, empat faktor ditemui dalam fasa penerimaan: kesediaan organisasi, halangan e-pemerolehan, kepentingan e-pemerolehan dan kepercayaan terhadap e-pemerolehan.

Dalam kajian kualitatif, empat kes paling kaya maklumat dan prinsip variasi maksimum dipilih. Satu kes daripada setiap kumpulan pembinaan (klien, kontraktor, perunding dan pembekal) yang mempengaruhi proses pemerolehan turut dipilih. Hasil daripada fasa kuantitatif dan data dikumpul daripada pelbagai sumber.

Pengekoden terbuka (open-coding) dan analisis data teks dilaksanakan dengan MAXQDA 10. Lapan tema berkaitan pengenalan dan proses penerimaan EP dalam kumpulan pembinaan wujud dalam analisis bertema daripada setiap kes dan merentasi semua kes. Tema tersebut termasuk integrasi teknologi internet, penggunaan teknologi e-pemerolehan, perkongsian ilmu / pengetahuan, prosedur bukan standard, penglibatan pihak pengurusan atasan, *interoperability issue*, isu perundangan, dan kesedaran tentang perubahan (inovasi).

Tema daripada setiap kes berbeza dari segi bilangan dan kesamaan kategori. Lebih banyak kesamaan diperhati dalam kalangan peserta dari sudut integrasi teknologi internet berbanding dengan penggunaan teknologi e-pemerolehan dan faktor yang berkaitan dengan ilmu / pengetahuan. Integrasi teknologi internet dan penggunaan teknologi e-pemerolehan adalah tema yang paling banyak dibincangkan. Kedua-dua tema atau faktor ini boleh membantutkan atau mengganggu kesempurnaan fasa pengenalan dan kelanjutan fasa penerimaan.

The interpretation phase integrated the results of the quantitative and qualitative phases to present the outcomes of the entire study Interpretasi fasa mengintegrasikan atau menyepadukan hasil daripada fasa kuantitatif dan kualitatif untuk memberikan natijah (outcome) daripada keseluruhan kajian. Dua daripada tema yang wujud dalam fasa 1 adalah sama (penglibatan pihak pengurusan atasan dan kesedaran tentang perubahan atau 'inovasi'). Walaupun, beberapa faktor mengungkapkan nilai yang sama dalam fasa kuantitatif, namun tahap

kepentingan daripada faktor-faktor tersebut dapat ditentukan daripada dapatan temu bual. Kesamaan dalam makna membantu penggabungan sesetengah daripada tema ini dengan faktor terdahulu atau yang sedia ada. Justeru, satu model dibangunkan bagi faktor penting yang memberi kesan terhadap pengenalan dan penerimaan EP dalam kumpulan pembinaan.

# THE ELECTRONIC PROCUREMENT INITIATION AND ADOPTION IN THE CONSTRUCTION INDUSTRY

## ABSTRACT

This research aims to identify the essential factors that affect the initiation and the adoption of electronic procurement (EP) in the Malaysian construction industry. A mixed-methods sequential explanatory study was used to identify these factors in four different construction groups, namely, client, contractor, consultant, and supplier groups.

In the quantitative study, the research focused on identifying the essential factors that affect the initiation and the adoption of EP in the Malaysian construction industry. Exploratory factor analysis (EFA) was used to identify these factors, which were grouped according to relatedness.

Data were collected via postal and Web-based survey systems (N=528). The overall response rate was 54.15%. The participants answered the survey questions, and the data were analyzed with descriptive statistics, ANOVA, and EFA.

EFA identified six different factors that affected the initiation and the adoption of EP in the four construction groups at two separate phases. Two factors were identified in the initiation phase: IT maturity level and awareness of procurement innovation. Meanwhile, four factors were identified in the adoption phase: organizational readiness, e-procurement barriers, perceived benefit of e-procurement, and perceived trust of e-procurement.

In the qualitative study, four different cases that had the richest information and the maximal variation principle were selected. One case each from the four different types of construction groups (client, contractor, consultant, and supplier groups) that influenced the procurement process was selected. Results from the quantitative phase and the data collected from multiple sources added depth to the analysis.

Open-coding and text data analyses were performed with MAXQDA 10. Eight themes related to the EP initiation and adoption processes in the construction groups emerged in the thematic analysis of each case and across all cases. These themes included the integration of Internet technologies, e-procurement technology usage, knowledge sharing, non-standardized procedures, top management involvement, interoperability issues, legality issues, and awareness of changes (innovations).

The themes comprising each case differed in number and similarity of categories. More similarities were observed among the participants in terms of integration of Internet technologies than in terms of e-procurement technology usage and knowledge-related factors. Integration of Internet technologies and e-procurement technology usage under the procurement process were the most discussed themes. The factors integration of Internet technologies and level of e-procurement technology usage jeopardized the completeness of the initiation phase and prolonged the adoption phase.

The interpretation phase integrated the results of the quantitative and qualitative phases to present the outcomes of the entire study. Two emerging themes were similar across the factors identified in phase 1 (top management involvement and awareness of changes or “innovations”). Moreover, some factors expressed equal values in the quantitative phase, but



the transcribed interviews determined the level of importance of these factors. Similarities in meaning helped merge some of these themes with those of previous factors. Therefore, a preliminary model was developed on the essential factors that affect the initiation and the adoption of EP in construction groups.

