



Disruption And
Transformation In The
Built Environment

PAQS CONGRESS 2022

9 TO 13 SEPTEMBER 2022
SINGAPORE



Identification of Digitalization Characteristics for the Surveying Practices across the PAQS Country Members – via an Interview Survey

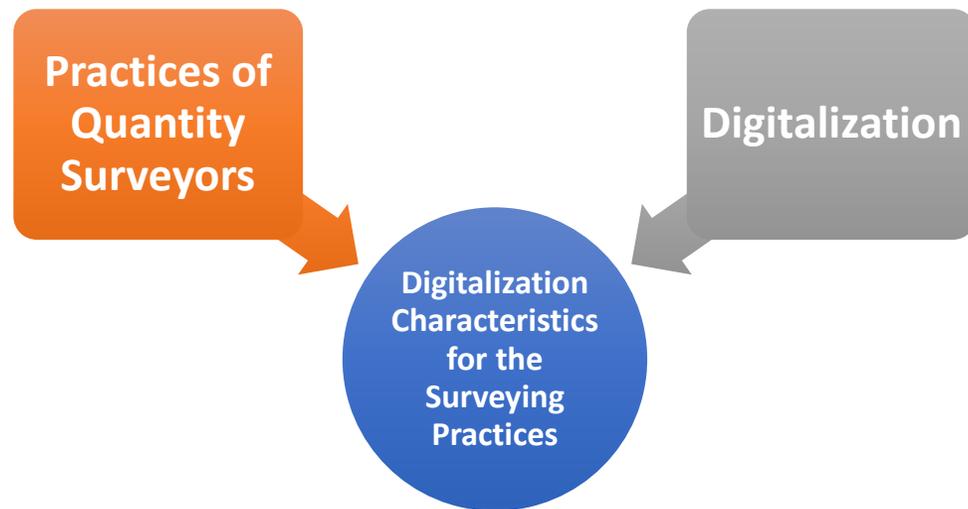
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Introduction

- The construction industry is known as one of the most information-intensive industries (Toole, 2003).
- The industry is still heavily reliant on the traditional means of communications (Mohamed and Stewart, 2003), resulting in low productivity and poor project management (Wu et al, 2017).
- With application of modern information technologies, digitalization is considered as a potential solution to facilitate the exchange and management of information (Rivard et al, 2004).



Literature Review



Methodology



exploratory study



international
interview survey



7-point Likert-type
scale

April 2022 to August 2022

Country	Respond Number	Respond Percentage
Brunei (BR)	6	12.5%
China (CN)	5	10.4%
Hong Kong (HK)	7	14.6%
Indonesia (ID)	11	22.9%
Japan (JP)	7	14.6%
Singapore (SG)	4	8.3%
South Africa (SA)	8	16.7%

01

Software
Application

02

Digitalization
Characteristics

03

Project
Performance

Findings

Findings

- Software Application

Country	Design > Tendering Stages	Estimation > Construction > Maintenance Stages
Brunei (BR)	Not mention	Buildsoft, Vico Office, Cubit, BuildSpace
China (CN)	preferred not keeping the same software in use	
Hong Kong (HK)	Not mention	Buildsoft, Vico Office, Cubit, <i>cloud computing software</i>
Indonesia (ID)	Glodon, iTWO costX	Glodon
Japan (JP)		In house system
Singapore (SG)	Revit, iTWO costX	Buildsoft, Vico Office, Cubit
South Africa (SA)	QSPlus	DimensionX, WinQS

Findings

- Digitalization Characteristics 26 variables were identified and categorized into six major aspects

Manifestation	Key Excerpts
Digitalization Characteristics	
D1. Work Preparation	
Popularity	HK-7 : Secondly, there are many BIM software in the current market, but <i>no one actually know which software would be used in the future.</i> JP-1 : We use AutoCAD because it is <i>widely used in the world.</i>
Simplicity	SA-1 : <i>It has kept relatively simple, relatively affordable and intuitive. It's not too difficult to learn.</i>
Adaptability	SG-1 : Software does <i>not follow closely QS Practices and Procedures.</i>
Extensibility	JP-4 : In-house development of proprietary tools for analysis, such as <i>plug-ins</i> , etc.
D2. Information Updating	
Tailorability	HK-3 : The flexibility is higher than other software, because <i>you can tailor made (say, summary, list or table) by yourself.</i>
Editability	ID-1 : It can be <i>easily modified</i> as designs developed. SG-4 : Dependency on the software, marked up filed <i>can only be edited in the same software.</i>
Extractability	CN-3 : This software mainly <i>calculates the results</i> by input related images and dates.
Convertibility	SA-8 : <i>You measure in 2D, use the 3D system or for just the 3D modeling more for checking that you know your quants and that type of thing.</i>
Traceability	JP-2 : Difficult to manage <i>revision history.</i>

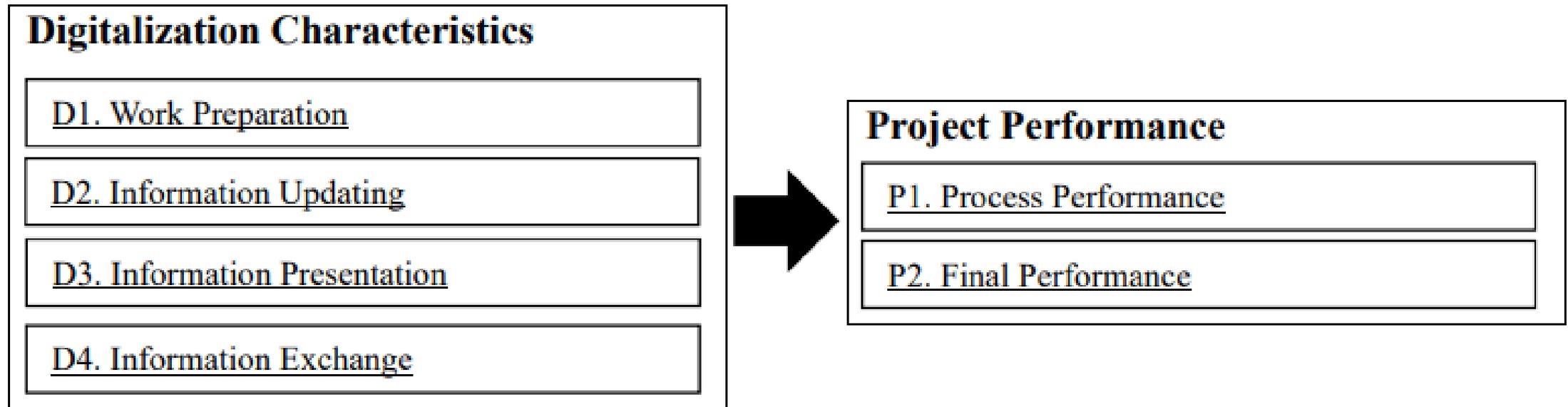
D3. Information Presentation	
Classification	JP-2 : Easy to use <i>item classification and tabulation functions</i> because the software is <i>specialized for creating itemized statements.</i>
Comparability	BR-1 : Assist to <i>find discrepancies</i> HK-1 : Hence, when we are using TAS to do tender analysis, we can use the software <i>to do the comparison.</i>
Reliability	ID-1 : It is <i>too easy for staff to rely on the software</i> , and not consider what information is being output.
D4. Information Exchange	
Shareability	JP-2 : <i>Data linkage with fabricators</i> is possible, but follow-up on operational aspects (rules, etc.) is difficult.
Real-time operability	CN-2 : It can also output various types of operating data <i>in real time</i> on the construction sites.
Compatibility	SG-2 : At this stage, the software <i>can not show any connection to the procurement method.</i> SA-4 : <i>However, now it's (DimX) very much more compatible with QS plus.</i>
Interoperability	HK-6 : It has <i>little interoperability with other software.</i> ID-1 : It <i>doesn't always integrate well with design software</i> used by architects and engineers.

Finding

- Project Performances

Manifestation	Key Excerpts
Project Performance	
P1. Process Performance	
Project management	CN-1 : Characteristic wise, it remains <i>high guidance value</i> for on-site construction and <i>strong controllability of project construction funds and progress</i> with complex modeling process.
Process simplification	SA-5 : The software makes life simpler in the standard stuff. It makes life simpler where you don't need to set up a full format.
Comprehensiveness	HK-5 : It can <i>achieve the same result, but the approach is less comprehensive.</i> SG-2 : The software can provide better performance by having a <i>comparatively holistic perspective</i> to present the design.
Effective communication	ID-1 : Another benefit is that in the event of staff changes it is <i>easy to handover.</i>
P2. Final Performance	
Time	SA-8 : Dimension X and programs like it, they drastically improve the speed in which you can measure and do takeoffs.
Number of errors	CN-4 : On the characteristic wise, this software remains some real good parts such as <i>quickly and accurately</i> evaluating whole scale of the project.
Clear presentation	BR-1 : Visual Representation
Productivity	ID-11 : Once the data collected, it can make <i>higher productivity</i> for revisions.
Client satisfaction	SA-6 : What does the client want? They want an accurate estimate, they don't care about what's happening on the site and they would want the final account that they see coming.
Trust	HK-3 : When I would like to claim payment after receiving the file, I, as a contractor, <i>don't fully trust him.</i> Because <i>I don't know his measurement,</i> we are not based on the same model.

Disposition Model



Conclusion

- data were gathered from a relatively small sample of quantity surveyors which may not reflect the full picture of current digitalization practice in quantity surveying.
- Since part of the data was collected by completed interview forms, there is the possibility of subjective biases during the note-taking process.
- Future studies are suggested to adopt contextual data analysis by collecting scripts and conducting cross-checking by data analysis software to obtain more objective results.

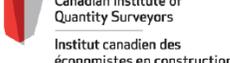
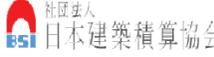
Conclusion

- Based on an interview study of software applications for quantity surveying practice during different development stages, this study identified various digitalization characteristics into four major dimensions: work preparation, information updating, information presentation, information exchange; and two types of performance (i.e., process performance and final performance).
- In order to understand the impact of the digitalization characteristics on the surveying practices, further studies on a quantitative study across the countries are strongly recommended.

Acknowledgement

- The work described in this paper was fully supported by a grant from the PAQS in 2022
- The contribution from all PAQS countries members



 Australia	 Brunei	 Canada	 China	 Hong Kong
 Sri Lanka	Full Members of Pacific Association of Quantity Surveyors			 Indonesia
 Singapore	 Philippines	 New Zealand	 Malaysia	 Japan

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THANK YOU