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The Influence of Empowerment Attribute on Leadership Competencies to the Intention of BIM Adoption in Malaysian Facilities Management Industry : NCT Technique Via ATLAS.ti Software

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Abstract

The leadership competencies framework developed striking to the fear facility manager that intend to adopt BIM, and one of the attributes consist of empowerment variable. Therefore, this ethnography strategy study is an attempts to elucidate the empowerment parameter that needs in the intention adopt BIM by the facility manager. A qualitative research designed and entailed ATLAS.ti software for analysing interviews with five (5) experts. Data interview collected by the following content analysis approach. Thus, the natural unit data analysed by NCT techniques. At the end of the interview, seven (7) proposed elements maintained, with the necessary improvements as the result of there are a handful of experts recommended for modification consistent with the local context. Furthermore, there are two (2) elements suggested by experts that necessary to be added to this variables. The final assessment revealed to form nine (9) elements that shall be in the empowerment parameter in leadership competencies to adopt BIM.

Keyword: Empowerment; BIM; Leadership Competencies; Facilities Management; ATLAS.ti software

Introduction

In architecture, engineering and construction (AEC) phase, Building Information Modelling (BIM) usually requested to adopt based on the client demand. Without request by the client, BIM adoption is marginalised in the AEC project. Contrast to facilities management (FM) industry, the domination consideration of BIM adoption is initiative comes from a facility

manager intention. Despite BIM topic intensively dealt in the built environment, instead, the most practitioner and researcher agreed that the implementation and adoption of BIM in AECFM is a challenging endeavour (Poirier, Staub-French, & Forgues, 2015). As revise the BIM adoption in FM industry, BIM is not entirely adopted the current practice in global context global (Becerik-Gerber, Jazizadeh, Li, & Calis, 2012), (Motamedi, Hammad, & Asen, 2014), (Aziz, Nawawi, & Ariff, 2016a). This scenario is critical determinant that it is noteworthy the facility manager as a leader and decision maker very influential affect the rate of BIM adoption in FM industry.

Indeed, the implementation of new technology of information system (IS) will do not go smoothly for weak leaders (Poirier, Staub-French, & Forgues, 2015). To enhance BIM adoption in FM, it is crucial there is strong leadership in management (Mcauley, Hore, West, & Rowland, 2013). Thus, to prevent their reluctant from adopting BIM, BIM leader must be clarified of competencies in need to increase their intention to use of BIM in FM. Meanwhile, the top management, owners or client that reliable capacity would accept the manager's intention if they believe the managers are competent enough to deliver the innovation. Referring to Boyatzis, 2011 mentioned that leadership competency in IS cluster is a set of related but different sets of behaviour organised the underlying construct of 'intent'. His study also agreed that the alternative manifestations of the intent are behaviours, as appropriate at various times or situations. Contradict with core competence in managerial skill that doing the right thing. The leaders shall have their own intention to deliver the paradigms shift for improvement in organisation. Therefore, the related theories might apply shall consist of intention of adoption among the leader's consumer.

In our reviewed and proposed theoretical framework for leadership competencies framework, we addressed that there were seven (7) attributes might has the relationship with the intention to adopt BIM in FM. The attributes involving aptitude and attitude component namely, vision, achievement, empowerment, team leadership, change management and leadership behaviour. However, in this paper, we emphasised empowerment variable and clarified the element by expert's interview. In essence, the empowering of staff through BIM may influence substantial part of decision making by facility manager (Poirier, Staub-French, & Forgues, 2015). In leadership style, instead of using the power of authority as manager, the empowerment leadership style may gain trust and motivate to held own individual responsibilities among middle management, upper management and lower management.

Somehow, the research focused on the variable in Malaysian context. Indeed, the qualitative design method employed in this study involving the experts from non-academician to clarify the elements demonstrated in empowerment attribute from literature review. The semi-structured interview instrument came together with a list of element gathered from our reviewed might guiding the respondent's decision. Also, a survey done by Volk, Stengel, & Schultmann, (2014) revealed that more than half (65%) facility managers responded that they are aware of BIM and how this innovation used for the built environment (Aziz, Nawawi, & Ariff, 2016a) . (Aziz, Nawawi, & Ariff, 2016a). Meanwhile they were fear to adopt BIM innovation in the FM field need modification with each element presented. The noticing, collecting and thinking (NCT) via Atlas.ti adopted derived from data collected to synthesise decision across interviewees. To achieve the study expectation, the objective of this study are:

1. To determine the leadership competencies parameters needed in the intention to adopt BIM in FM.

2. To examine the empowerment parament and the intention of BIM adoption in FM in the context of Malaysian facility manager's perspectives.

Empowerment on leadership competencies of a facility manager

The traditional mindset often finger pointed to the managers in case the event of default in a team occurrence by the lack of attitude in the leadership style. Some of the lack leader's behaviour factors may be correct. Instead, some of the factors do not come himself solely from an individual leader act. According to McCallum & David, 2009 that studied empowerment attributes in managerial psychologies, the study mentions that social capital-skill specific to skill development remain undervalued compared than human capital to develop leadership component in the diversity of the organisation. In the study also stressed out that, traditional leadership research emphasised human capital component in the leadership structure that in line with behaviour, style, task and nature of the decision.

The skill of leadership competencies is crucial and need to be polished to generate a talented leader's behaviour. An efficient organisation will understand the needs of managers to develop and overpass their leader's talent beyond their boundaries. The rationale of social capital component seems crucial due the external circumstance factors sequent impetus for the decision of what needs to be done by a leader of efforts to become a competence leader. Without proper external capacity affects to be interfering with the intention of BIM adoption. According to classical behaviour study review done by Shani & Lau, 2000 the situational factors are the influence that does not occur by the individual action but the environment that around the individual. The situational factors address in the study is internal environmental (task environment) and external environmental factors (wider environment) factors. Indeed, these functional factors considered as contingency factors may not come from a person's behaviour factor. In this case, external environment represented by the social capacity that influences the decision's intention. In sum up, in the attributes of empowerment, social capital and human capital related to the aptitude to develop leadership competencies toward the adoption of new technology.

Empowerment is an attribute referring to the that the ability to delegate power and responsibility, build trust and inspire others and it also means to motivate and coaching to take individual responsibility (Sydänmaanlakka, 2003). This leadership competencies skill considered as an ability to control the process and at the same time, need for high levels of trust from many angles. The empowerment parameter is a need by a facility manager if he wish and have the intention to adopt BIM in the organisation. There are seven (7) elements of empowerment attributes need to be a focus on this study:

Support from another department

Facility manager needs a high support from another department to adopt BIM (W. Enegbuma, Aliagha & Ali, 2014), and the current BIM adoption is reluctant by another stakeholder (Azhar, Khalfan, & Maqsood, 2012). Bias promotion and challenging bureaucracy from other department/profession or top management in the organisation with less operational experience will claim BIM implementation may entail serious and costly obligations for the company to prepare (Smith & Tardif, 2009). However, no business leader can reform an organisation without the support of his or people, support that leader earned through persuasion rather than coercion.

Moreover, the primary reason for the low support of another department is they do not want the addition of new job load. It is said that in collaborative processes and BIM

specially interdependence, joint decision making and foster communication that blur the distinction between parties (Ashcraft, 2008). Therefore, an additional job it will require a discipline to portfolio management. That's the reason of highly support from another department shall need to determine the optimal resource of product delivery, schedule activities to meet asset's owner operational, considering supply chain behaviour, customer constraint and financial goal while (Aziz, Nawawi, & Ariff, 2016b; Love, et al., 2014)

Information author willingness to transmit digital information

The one of the most challenging in BIM adoption area obstacles to sharing building information, since so few data interfaces, exist (Smith & Tardif, 2009). Nevertheless, BIM innovation can provide benefit by materialising through changes by the internal and external stakeholder such customer, and suppliers with an asset owner's supply chain (Love et al, 2014). However, information author may be unwilling to transmit digital information out of concern that they will be held the liable for inappropriate or unintended use of the information or that they will assume liability for information contained in the data transmitted that heretofore has been the responsibility of the receiving party (Smith & Tardif, 2009). The unwillingness form any party might result to less satisfaction, questioned and jealousy among stakeholder that willing to cooperate. Also, that situation deliver to low respect to leaders.

Vendors and consultants who are to be held responsible for delivering information for BIM cannot be made accountable for providing information if the requirements are unclear or if it is beyond their ability to provide it due to circumstances outsides of their control (Ashcraft, 2008). When building information is available to all business partners, its transparency can positively affect behaviour (Smith and Tardif, 2009). Many companies do not want to share too many details with their competitors due to competitive (Palos, Kiviniemi, 2013). Any structured compilation of information is inherently more valuable, and its misuse potentially more dangerous than the same information is unstructured, decentralised form (Smith & Tardif, 2009), Ineffective collaboration occurs by the apprehension of distrust and litigation and process (Enegbuma, Aliagha, & Ali, 2014). When the BIM user other than owner and internal team that contribute data, the licensing issue can arise (Azhar, Khalfan, & Maqsood, 2012)

The volume of building information that has been creating thus far is relatively small, and only a fraction of the BIM data produced to date has been passed on to building owners and facility managers, many of whom lack the tools and organisational infrastructure to use the data effectively (Smith & Tardif, 2009). A significant number of design and constructions professional are reluctant to pass building design information onto owners or other third parties for a business process that extends far into the future, for which the information was not originally intended, and over which they will have no control. Liability for design professionals extends many years after they fulfilled their contractual obligations, often far beyond the period of the much less liability of contractors (Al-kattan & Jrade, 2015; Smith & Tardif, 2009). Although, e.g. responsibilities for hazardous materials on site stipulated in new construction, contracts need adaptation to existing building' requirement due to, e.g. owners' liability for legacy (Volk, Stengel, & Schultmann, 2014b)

Worse, the difficulty of software vendor involvement that including competition, fragmentation among different vendors and lack of common interest (Becerik-Gerber, Jazizadeh, Li, & Calis, 2012). Outsourcing BIM adoption may become an alternative for a higher usage of BIM in FM. Somehow, due to weak consent in procurement level effects in

the vendor to transfer the information to the stakeholder effects of that vendor held the liability of the information contained. The related issue of ownership of model, intellectual property rights and copyright issue based on content development and use Wu & Lepech (2020) are the typical problem in an information system. The facility manager must be careful in procurement level due dealing with the outsourcing BIM vendor.

External relationship

The critical factor in the implementation of the new system renegotiating the term and conditions of the business relationship with vendors and suppliers (Smith & Tardif, 2009). One of the dilemmas of the owner is, the change of FM contractors that often effect notoriously poor handed over data between the contractors may leading to additional fee survey cost (Kelly, Serginson, Lockley, Dawood, & Kassem, 2013). Beside of financial issue, the changeover of responsibilities and responsibilities leaders to confusion and uncertainty (Eadie et al., 2014). Thus, the need to be well relationship with the client's stakeholder to ensure the information might transfer well. Also, for the in-house FM, the good relationship with external parties might attract the external willingness to insert the information in need by themselves.

The other issue of a BIM in FM application contracted period due to the traditional procurement of FM contractors are appointed three to five years (Kassem et al., 2015). As Kassem et al. (2015) recommended that to avoid double charge during condition survey for maintenance to start the project and accuracy of data duplicate, facilities maintenance contractors are advised to be paid to complete as-built condition survey from the contractor. For instance, to avoid/ delegate additional or over rated charge, facility manager must have the power skill by building trust among external relationship. The noble, charismatic, persuasion and humble attitude would aid the leaders to communicate and bargain with the external parties. The leaders that able to 'control' the bargaining process might increase the organisation competitive and profit. In a nutshell, the leaders acted as the symbolically represents and spokesperson the organisation to external constituencies (Luthans, 2005).

Legal certainties integrated

Legal certainties integrated (Azhar, 2011; Eadie et al., 2014; Enegbuma et al., 2014; Harris et al., 2014; Love et al., 2014; Palos, & Kiviniemi, 2013; Volk et al., 2014; Zakaria et al., 2014). in are seen as one of BIM adoption solution that promote power to facility manager by enforcing certainties law. One of the dilemmas of the building industry that is seemingly unsolvable is short of modifying state laws nationwide to narrow the scope of professionals liability for design professionals (Smith & Tardif, 2009), (Becerik-Gerber et al., 2012; Eastman et al., 2011; Kassem et al., 2015; Kelly et al., 2013; Smith & Tardif, 2009). There will be the issue of data embedded in the model and ownership of models. Intellectual property rights and copyright issue based on content development and use (Poirier, Staub-French, & Forgues, 2015; RICS, 2014). When a technical obstacle perceived as insurmountable, they are rarely surmounted (Smith & Tardif, 2009). The copyright protection, ownership and others laws need to determine in legal risk (Kassem et al., 2015).

There will also be a contractual issue about BIM services. Thus, organisational and legal BIM frameworks vary in different countries and application in new or existing buildings, but various stages of development are not reported or examined in the literature yet (Williams, Shayesteh, & Marjanovic, 2014). Currently, there is undefined fee structure and respective contracts for BIM BIM (Kassem et al., 2015; Volk et al., 2014). But as long as issues of model ownership and data responsibility, level of development (LoD), liabilities, and fees

are not stipulated or standardised; it will hinder BIM implementation in existing buildings due to reduced data security and user confidence (Williams, Shayesteh, & Marjanovic, 2014). Currently, there are absent of particular standard form of contracts globally coverage of BIM. The current contracts do not implicitly, explicitly or bar the use of BIM in any phase of the projects. As BIM implementation demands profound process changes, it has significant implications for contractual relationships in FM industry (Volk et al., 2014; Wang et al., 2022; Williams, Shayesteh, & Marjanovic, 2014).

The emerging licensing agreement in BIM policies affects the feasible option that limited use of another party while ultimate control and maintaining copyright (Kassem et al., 2015). However, the licensing agreement challenged by the difficulties with model validation and embedded data and result to handover most contract forms still require to transfer in the paper format (Kassem et al., 2015). Organisational and legal uncertainties issues seem to be major levers to influence BIM implementation due to their coherences of BIM in a broader sense (Volk et al., 2014; Zakaria et al., 2014). (The governance perspective supposed to be required whereby BIM integrated with portfolio, program and project throughout the asset's lifecycle (Williams, Shayesteh, & Marjanovic, 2014). The trend of older professional that still lags behind meanwhile the lack of legal experience in legal experience among younger professionals (Enegbuma, Aliagha, & Ali, 2014).

Decent qualification as a facility manager.

In Malaysian initiative perspective, various professionals are often undertaking the roles of facility manager in Malaysia, especially the civil engineers and mechanical and electrical engineers. Haris, Adnan, & Jusoff (2008) critiques that these professions are not specially designed to cover required knowledge and skills of what supposed to be expected by facility managers. There is certified facilities manager course that provided by professional bodies such International Facilities Management Association (IFMA, 2013). in global is a credit value to the facility manager. In Malaysia context, certified building surveyor (BS) in BS division at Royal Institute of Surveyor Malaysia (RISM) also considered as a added value as a facility manager. Not every single graduated BS holder interested to register as a qualified BS practitioner. Therefore, a certified BS specialist is less prominent in for a facility manager's leadership skill development.

Facility manager hold BIM certification.

One of the improvement of BIM adoption in the FM industry is leveraging issuance of BIM certificate that integrated by public sector. Meanwhile, in reality, the certificates in software literate awarded by certifying body or non-government organisation NGO that someone has a specific level of knowledge in particular technology (Bourgeois, 2015; Garrido et al., 2009). In global, many ICT training done by NGO training program integrated organisation themselves certifying authority together providing training material in a private lesson if they were not developed by government or NGO (Latiffi et al., 2014).

In s Zakaria et al., (2014) study also advises that the roles of facility manager have to fulfil by FM and to build surveying holder either in master or degree level course as the subjects designed in Malaysia public university match with the roles of FM. To reach of BIM goal in FM, it is necessary to have good knowledge about BIM technology, but also understanding about the working field (Enegbuma et al., 2014). As per advice by the Haris et al. at least the decent qualification is an essential element as a facility manager. Thus, the facility manager shall at least have degree qualification in operation management such as

property management, or any equivalent related to FM. Construction Industry Development Board (CIDB) that represented public sector cooperated Construction Research Institute of Malaysia (CREAM) provided training in Malaysia formed and facilitated training in the built environment field. There are also BIM training organised by Multimedia Super Corridor (MSC) that provided BIM guideline and BIM usage that award BIM professional certificates to the participant. MSC is a government initiative to attract the higher for the national level adoption of ICT. At the moment, the training held focused to design and construction adoption.

The certificate for ICT literate issues to certify two (2) measure: participant and completion of training or competencies (Bourgeois, 2015). Succar (2014) realised that the training involvement depends on the organisation financial matter as the BIM competency course would charge for a higher cost. proposed that the certification of BIM competencies shall issue by external consultant complete with highly-detail appraisal those skill areas applicable across sectors, markets and discipline. To award the competencies certificate, the participant shall pass the exam (Garrido, Sullivan, Gordon, & Coward, 2009). In some circumstances, certification of competencies is much valuable rather than a certificate of completion (Bourgeois, 2015). Nevertheless, it is not a compulsory for a facility manager as a leader to become a competency BIM usage. A good leader develops the manipulating skill to optimal and boosts the particular follower skill. On the other hand, certification of completion able to garner recognition and legitimately if the employers a familiar in the ICT skills (Bourgeois, 2015). At least the facility manager has to participate and complete the BIM training programme as the evidence the facility manager able to control the stakeholder.

Facility manager mutuality and approachability with subordinate

The lack of mutual understanding of time required BIM model and BIM process lack of communication intent are said the current barriers in BIM project setting [1]. In BIM, the responsibilities and role of a leader is a fundamental requirement for mutual of respect, reward and benefit, decision making collaboration, early goal definition, open communication and intensive planning (Poirier et al., 2015). Therefore, mutual respect and trust with subordinate (Ahbabi & Alshawi, 2015) seems crucial to employ the innovation and important parameter for a facility manager to work in a team.

Method

According to Kumar [2005], the exploratory study undertakes to carry out when the researcher has a little or no knowledge of the research area. Indeed, the gap of understanding in BIM adoption in FM drives the researcher to establish and study more directive in BIM adoption in FM and develop the operational research design in this study. Due to limited secondary data emphasize to FM industry, the elements gathered acquired the empirical evidence to clarify the element proposed in this study. As according to Hseish and Shannon [2011] mentioned that the gold of content analysis is to provide an understanding of the phenomenon under study through the systematic classification process of coding and identifying theme or pattern. This study employed directive content analysis wherein the data to synthesise more structure and easier to compare across the experts. In consonance with this technique primarily to explore participant's experience of depression, anger, denial bargaining and acceptance.

Due to lack of researcher's knowledge and literature for suitable case study, the qualitative data gathered from five (5) BIM expertise in built environment industry. Thus, the ethnography strategies selected by gain the data from the phenomenal perspective. As

manifested by Creswell (2014), the amount of interviewee for a phenomenology study are between five until twenty-five. The measurement instrument in this study employed semi-structured interview. The purpose of an interview done was to gather the BIM expertise opinion as potential critics. Their opinion is also intended to ensure that the view of the literature review from a global perspective is compatible with the reality situation. Self-administration interview was designed to collect the data needed in this study. The in-depth interviews with experts in BIM were interviewed in order to increase the content validity of the measurement in the upcoming our planned survey. Thus, the feedbacks from the interviewees used to revise for the parameter before sending to the respondents.

The appointment interview set in private with the expert during their working hour in their office. During the face to face interview, a piece of paper of the list of elements in EMPOWERMENT variable, the researcher presented on the expertise table. The meeting began with their demography information by filling the form given by the researcher. Next, the main question asked in the interview.

The main question asked is:

"In your opinion, does the parameters listed below are the leadership competencies required by facility managers in the adoption of BIM in Malaysia? Kindly, please comment, explain and provide any recommendations for improvement to the list (see below)" (refer Table 1.1)

Table 1.1:

Empowerment variable

Variable: EMPOWERMENT Elements
E1: Support from another department
E2: Information author willingness to transmit and share digital information
E3: Good external relationship
E4: BIM legal certainties
E5: Facility manager hold BIM certification
E6: Decent qualification as a facility manager
E7: Facility manager mutuality and approachability with subordinate

The experts answered the question referred to the list of EMPOWERMENT's variable provided and the audio was recorded using a voice recorder in MP3 version format. Later, the recorded data transcribed, quoted and coded programmed by Atlas.ti software. Thus, using ATLAS.ti software, the main theme of EMPOWERMENT code considered as a free code (no linkage with any quotation). EMPOWERMENT represented the main code in this study. Every elements proposed from literature review that associated with main code considered as the sub-code to main codes. There were seven (7) sub-codes of the particular sentences known as quotation that associated with codes might highlighted to link with the main code. The additional quotation namely 'additional code' as the element added proposed by the expert's point of view. In this study, the function of MEMO was to support the point of view for any agreed, disagreed or need modification of any respond.

The application of network mapping in ATLAS.ti was curial with the aim to clarify for any amendment or missing codes, quotation or memo in this study. In this study, we were not implement the family network. We planned to did the manual checking for detect any missing information after review the mapping the network. The manual tree network is a unique technique implemented in this study to link among codes that able manually checking for any error and missing conservation. The manual network created by dragging arrows

between codes. Once the linkage meet our satisfaction and quotations matched with codes, we generated the report via the generated output in the form of codes-quotation list and filter all mode.

During the interview, one of among interviewees advised and introduces the researcher to interview any potential director from BIM in FM vendor for the purpose to get more accurate opinion parallel with the reality BIM in FM industry. The last one (1) respondent was the acclaimed director of a company that provided BIM outsourcing/ vendor services for FM selected among the introduced by that expertise previously. Three (3) of them hold Master certificate and pursuing their PhD in Built Environment field. Meanwhile, two (2) of the interviewee informed that the level of educational background were Diploma certificate holder.

This study employed the CAQDAS (computer-assisted qualitative data analysis) tools adopted Atlas.ti software, the structured interview transcribed to quote. In essence, the ATLAS.ti software itself unable to analyse the qualitative data but have the ability to arrange the qualitative data. Thus, the researchers employed the NCT technique (refer Figure 1.1) developed by Creswell (2014), to arrange the important data in order to get accurate meaning in content analysis. Once the interview done, the recorded MP3 audio transcribed using ATLAS.ti 7.5 software. To form transcription document, the researchers created an embedded document in to create transcription. In order to synchronise the audio speed, the researcher adjusts A-doc format to suit the tempo of audio in need. The data transcribed at once the sound played.

Later, the transcribed natural unit were quote based for any noticed important data (NOTICING). Then, the important quote collected in the appropriate programmed code (COLLECTING). Each code represented each theme in the analysis. At integrate the puzzle fit of coding, Atlas.ti software able to present as a tool for the concurrence explorer or query tool in qualitative analysis. Later, the content form the result of analysed data were analysed by manual in following this paper (THINKING).

Before the final stage of data analysis (THINKING), the data gathered simplified manually in the thematic analysis table for the purpose for easier checking. Ensuring that, the meaning of data interpreted in the form of 'Agree/ acceptable, disagree / unacceptable or need modification'. Meanwhile, for any experts comment or reasoning, the quote collected in memo to interpret or support the argument.

Result analysis (THINKING) and discussion

In this study, seven (7) elements presented to five (5) experts in the personal interview conducted. This interview was an attempts to get their perception of all elements that gathered from the literature reviewed. The elements proposed and presented accepted by the majority of experts. Instead, some of experts critiqued the elements either need to modify or removed from the variable. Nevertheless, the researcher provided the support argument and do judgement based on THINKING in NCT technique.

Among five (5) interviews, one (1) of the interviewee was a senior manager served in CIDB. Meanwhile, three (3) of others are senior manager until director designation of BIM E-Construct Sdn. Bhd. wherein the subsidiary of CIDB. The company's core business is wholly manage any appropriate BIM programme organised by CIDB. CIDB is a semi-government organisation that responds to provide workshop and awareness programmes that are looking forward to a holistic implementation of BIM in Malaysia CIDB also developed official BIM Portal that information related to products, consultancy and training to enhance BIM

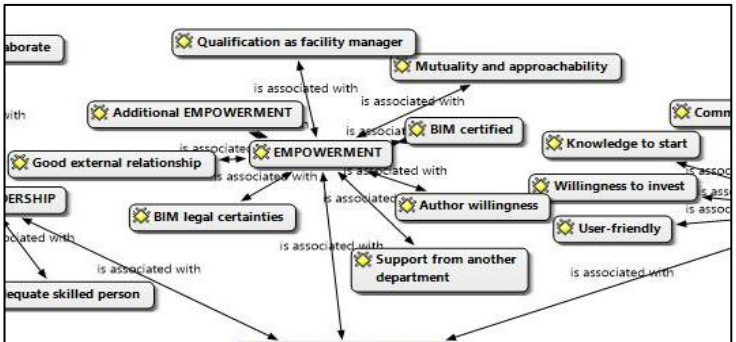
adoption in Malaysian industry . The unit of analysis directly to the expert that at least posted senior managers/ middle managers class that submissive in Malaysian BIM development. Thus, the current study ascended the content validity subjectively using extensive literature review and panel expert in BIM industry. These experts consisted of leader's level in who has experiences working in the built environment. All of the interviewees were aged over than 40 years, and all the expertise's experience in managerial level.

Table 1.2:
Finding for EMPOWERMENT

Original element	R	M	Remained/Modified element
Support from another department		/	Support from another department in the organisation
Information author willingness to transmit and share digital information		/	Information author willingness to transmit and share classified digital information
Good external relationship		/	Good relationship with service provider (contractor, supplier)
BIM legal policy certainties for FM	/		-
Facility manager hold BIM certification		/	Facility manager has BIM data management certificate for FM
Decent qualification as a facility manager		/	Decent education certificate as a facility manager
Facility manager mutuality and approachability with subordinate	/		-
Additional element:			
1. Facility manager charismatic to influencing the stakeholder			
2. Good relationship with the owner and top management			

(R: Remained; M: Modified)

Table 1.2 indicates the finding for variable team leadership. Two (2) original elements remained in the variable while five (5) original elements were modified. Their recommendations also supported after we reviewed the facts from the comprehensive literature review. We considered their suggestion able to be the additional parameter in this study. The modified elements were supported by another department in the organisation, information author willingness to transmit and share classified digital information, good relationship with the service provider (contractor, supplier), facility manager has BIM data management certificate for FM and decent education certificate as a facility manager. This study also stated two (2) additional parameters proposed by interviewee. We believe their point of view linkage with various literature review and well accepted in this study. The additional elements are facility manager charismatic to influencing the stakeholder and good relationship with the owner and top management.



Picture 1.1: The cross section of EMPOWSERMENT relationship analysis by NCT Technique using tree diagram via ATLAS.ti Software

The Picture 1.1 indicates the cross section of NCT technique outcome with the aid of ATLAS.ti software. Each bubbles contained the information we arranged to avoid any missing of data. Overall, the during the data collection, the interviewee praised the theory proposed and pleased with the interview technique as it was easier for them to check all the parameters and elements proposed in this study. They also able to check any missing information that may aid to enrich the data of study.

Recommendation and conclusion

The ethnography strategy adopted the NCT technique concluded that there were nine (9) elements that in need as a parameter of an empowerment leaders that intend to adopt BIM in FM. The final modified or remained elements were; support from another department in the organisation, information author willingness to transmit and share classified digital information, good relationship with service provider (contractor, supplier), BIM legal policy certainties, facility manager hold BIM certification, decent education certificate as a facility manager and facility manager mutuality and approachability with subordinate. The additional elements proposed by experts and we agreed to add on in our parameter were namely facility manager charismatic to influencing the evidence. Moreover, the current study also taken from the perspective of interview. Therefore, we recommend to test the yield of this study from case study from others country among facility managers.

Contribution of Study

This study provides the importance understanding of the body of knowledge in the area of research. These regards extend the existing knowledge regarding technology adoption of BIM in FM. The study will provide several contributions of the current body of knowledge that provides detailed explanation related to issue empowerment among the manager behaviour. By relating the theories selected, a holistic leadership parameter developed to provide greater insight into the issue of technology adoption of BIM in FM. The integration of organisation behaviour theories deepens the use of theories in technology adoption by articulating the perception among selected facility manager that may affect the intention of other facility manager to adopt BIM in FM.

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