The Impacts of Pervasive Mindset and Dynamic Capability on Digital Technology Adoption in SMEs: Mediating Role of Management Team Support

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1. Abstract

Micro, Small, and Medium-sized Enterprises (SMEs) play a pivotal role in propelling national economic growth. The integration of digital technology holds the potential to revolutionize the automation of business operations within SMEs and open up novel avenues for business development. However, the adoption of digital technology also presents SMEs with intricate system engineering hurdles. This study aims to evaluate how SMEs can successfully adopt digital technology. The research objectives involve examining the relationship between predictors and digital technology adoption and exploring the mediating role of management team support. Using the quantitative approach, the study employs a simple random sampling technique as part of the probability sampling method. The study identifies significant variables such as the perception of technology, the perception of disruptive innovation, and management team support. Conversely, growth mindset, agility, adaptability, and ambidexterity were insignificant variables. Overall, the study contributes effective strategies for SMEs to navigate digital technology adoption challenges, fostering business growth and driving innovation toward digital transformation.

2. Keywords:

3. Introduction

Organisations embracing digital technology adoption as pivot paramount matter to stay competitive, drive innovation, and meet customers' ever-changing need. Digital technology adoption involves a combination of computing, information, communication, and connectivity technologies that trigger significant changed to improve an entity's properties [1]. Thereby, organisations businesses will be revolutionized their processes, enhancing efficiency, and unlocking new growth opportunities to leverage emerging technology such as artificial intelligence, cloud computing, big data analytics, and the Internet of Things (IoT). The study targeted population organisations were focused on Malaysia Micro, Small and Medium-sized (SMEs). Malaysia has 1,226, 494 SMEs in 2021 who struggled digital technology adoption for digital transformation purpose that particularly caused by the Covid-19 pandemic period of times. SMEs contributed 37.4% of Malaysia's national gross domestic product (GDP), 97.4% of total business establishment, and their employment accounted for 47.8% of the Malaysia's total employment contribution in 2021 [2].

Nowadays, SMEs face intense competition and pressure for innovation to be at equally with the latest technology developments. In conjunction of these, the problem statements of the study in SMEs context will be how SMEs necessary to manage a new challenges and difficulties for ever-changing market poses. As such to delve the improvement a still lack digital maturity towards grapples digital transformation to serve better of their customers' need and overcome constraints of financial and talent pool workforces. There are involved and concerned to SMEs employee by pervasive mindset and dynamic capability characteristic of the organisations and the critical role of management team support as mediator in between these theories and concept digital technology adoption of SMEs. Thereby, pervasive mindset, dynamic capability, management team support and digital technology adoption are key variables of the study. Digital technology adoption is defined as a characterized by integrating digital attributes into physical artifacts or business processes for establishment a comprehensive architecture of technologically advanced devices [3].

Pervasive mindset is defined as a deeply rooted thinking of organisations on how to response the impact from changing world environment. Its items construct of the study inclusive Perception of Technology (POT), Growth mindset (GWT) and Perception of Disruptive innovation (PDN) [4]. Dynamic capability is defining as the organisations ability to adapt to changing environments by reconfiguring internal and external processes and resources through its existing competences [5]. It items construct of the study inclusive Agility (AGT), Adaptability (ADP) and Ambidexterity (AMD). Management team support is defined as the sustainable organisations individuals who are in charge of coordinating and operationalizing interdisplinary communication between intra-firm and inter-firm departments and stakeholders.

The research objectives were aimed to examine the positive relationship between 3 items construct of pervasive mindset, 3 items construct of dynamic capability towards digital technology adoption, and mediating role effect of management team support. Furthermore, research objectives are designed to address specific research questions or gaps in current understanding. So, the researcher will be contributed to the existing body of literature and enhance our understanding of the subject matter. A paucity of research on investigating the relationship between mindset and digital technology adoption had been motivated the researcher to conduct the study in the area.

4. Review of Literature

The study selected the theories concepts of pervasive mindset, dynamic capability, management team support, and digital technology adoption as its primary provide variables study through Google Scholar search engine browser. Jones et al. proposed a categorization of three visualized elements that collectively constitute the concept of pervasive mindsets [4]. These three visualized elements are categorized as follows; perception of technology, growth mindset, and perception of disruptive innovation. All would give opportunity lead to value creation and assist the dissemination of technology adoption in improving the organizational performance [4]. Dynamic capability allows businesses flexibility to combine and reorganise internal and external competencies respond to the environment in changed quickly. Dynamic capability strategies have

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a high degree of alignment to quick reactions as a agility; fast response as a adaptability; and adapt innovation and revolution malleable for confronting constant change environment as a ambidexterity [6].

Management team support as a SMEs top management team must adopt a position stance of strategic vision in order to better direct efforts of digital transformation [7]. So the capability of the top management team would be to foster a culture of interconnection and information transparency; and foster the employees' sense of ownership and trust throughout the digitisation process [8]. Digital technology adoption has become an integral part of people's daily lives. Digital technology adoption is a strategic planned action for organizations to survive dependence available digital competencies imperative to sustain business values [9]. As such conversion of digital models into physical objects for enabling associate with digital technologies systems. It is a paradigm for potential to reduce waste through greater efficiency of raw material utilisation and provides the necessary of customers demand agreement [10].

4.1. Research theoretical framework and hypotheses statements

Below Figure is the theoretical framework of the study. A number of variables found to be associated to the study were extracted for the purpose of the study (Figure 1).
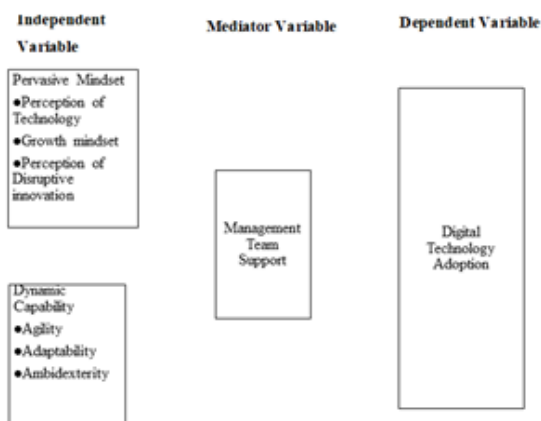
The domains of independent variables are inclusive pervasive mindset and dynamic capability. A mediator variable would include the domain management team support, and the dependent variable would be the domain of digital technology adoption. The domains of the independent variable would be expanded to include more items in each domain, and the dependent variable would be divided into two groups. As mentioned, the pervasive mindset domain further established sub-items of dimension items inclusive perception of technology, growth mindset and perception of disruptive innovation, which were adopted and adapted from the studies [4]. Digital technology dimension sub-group development is based on the low and high groups of digital technology adoption. Dynamic capability is focused on the dimensions of agility, adaptability and ambidexterity, which help to sense and seize opportunities and avoid threats. Dynamic capability will be upgrading an organisations superior resource over time in adapting changes for environment (Teece, Pisano, & Shuen, 2009), as cited in the study [11].

Finally, these items dimensions will be evaluated according to its magnitude levels which strengthened its effect on mediating domain of management team support in between item domains of independent variables to predict SMEs digital technology adoption [12].

5. Research Methodology

5.1. Research design

The study research design is based on a quantitative approach which employs online survey Google Form link with questionnaire closed and structural method for data collection. The intended sample size is 200 subjects of sampling and the sample is drawn from the website of SMEs Corporation Malaysia. The study employs a probability sampling design and simple random sampling method to gather the necessary data. The unit of analysis is the department head, manager or top management of SMEs. Thus, the study restricted only one of SMEs personal management team would be selected from each SMEs company [13].

Thereby, an extensive literature review was conducted to extract all the relevant measures from previous studies, used in operationalising constructs in the study. The questionnaire implemented some minor adjustments and modifications in wording to increase the applicability to measure the constructs of the study. Thus, the independent variables and mediator are used the 5-pont Likert scale because there are in metric value scale. The multiple-choice options for digital technology are transformed into a dummification file that categories them into two groups of non-metric value classified dependent variables, referred to as group '0' and group '1'. Means that group '0' and group '1' as 'low' group digital technology adoption and 'high' group digital technology adoption respondents respectively.

5.2. Measurement model

All the item constructs were modelled as reflective construct [14]. The item constructs reliability, composite reliability values CR is supposed to have a greater than value 0.7 indicator, the indicator reliability (outer loading) and Average Variance Extracted (AVE) both threshold value at least 0.5 value for confirmation of the convergent validity item constructs of the study [14]. The discriminant validity was assessed confirmed by comparing the square root of AVE. The pilot test is deployed a convenience sampling technique method to reach out fewer researcher company regular suppliers and 30 postgraduate study DBA degree students who are working in SMEs company. The respond were passed its statistical test rule of thumb threshold value [13].

6. Data Analysis

6.1. Descriptive statistic of data collection

The analysed finding which showed services sector with 49% is higher percentage rate in comparison between industries sector. The higher percentage rate for total employee of company is 41% which for category workforce in between 5 to 30 The finding higher percentage rate for "how long of your company establishment" question is 52% for category 'above 15 years' The higher percentage rate of gender falls in male category with 70.5%.

The education level higher percentage rate is 36.5% which fall in category post gradual.

The position rank higher percentage rate is 46% which fall in category manager.

6.2. Assessment of measurement model

An assessment measurement model involves measuring a degree of consistency reliability and validity of factor inter-items constructs study. All the measurement has met the rules of thumb values as follows. The Cronbach's Alpha of inter-items constructs showed in range 0.75 to 0.82, values factor loading and Average Variance Extracted (AVE) above 0.5, discriminant validity value lower than AVE and composite reliability of the items above 0.7 [15].

6.3. Assessment of structural model

There were inconsistencies standardized to fix measurement of digital technology adoption. Number of system digital technology picked by the respondent's company were converted into dummification Excel file and split into 2 group non-metric value classified as the dependent variables. Group '0' as low group digital technology adoption who picked not more than 3 items and Group'1' as high group digital technology adoption who picked above 3 items of digital technology systems.

The model 1 as metric value variables would be regressed management team support on POT, GWM, PDN, AGT, ADP and AMD in employed standard multiple regression for the model regressed hypothesis testing. These are hypotheses call for the use of mediated regression analysis and test the hypothesis that management team support mediates on effect of POT, GWM, PDN, AGT, ADP and AMD then further for hypotheses regression models tested by logistic regression analysis instruments on model 2, model 3 and full model regressed on digital technology adoption to predictors [16].

6.4. The result of statistical finding

The report for Block '0' output is baseline of logistic regression analysis which has displayed the result without the involvement of independent variables 59% of the respondents answered '1' for high digital technology adoption in classification table below (e.g. interested characteristic of outcome study). The 'Model Summary' tabulation provides valuable information about effect size of the study model. The Cox & Snell R square and the Nagelkerke R square values with 0.317 and 0.427 respectively

indicated the amount of variation in the dependent variable explained by the model. These are described as pseudo R2 statistical. Meaning that suggested between 31.7% and 42.7% of the study model variability is explained by the set of presence predictor variables to predict accuracy outcomes of dependent variable on observation of the population study [16]. The logistic regression output results shown were analysed by the Hosmer and Lemeshow Test. The Hosmer-Lemeshow for 'Goodness of Fit' test. The Chi- square value is 11.0 and the report output of significant value 0.202 is p>0.05; that is the targeted standardized requirement of the study for measurement model fitness in 'Goodness of Fit'.

The 'Classification Table' to indicate how well the model is able to predict the correct category for each case outcomes of dependent variable. By comparison this 'Classification Table' of Block '1' output (77.5%) to Block '0' output (59%) respectively of the Percentage Accuracy in Classification (PAC). There was much improvement when the predictor variables are included in the model. It is reflecting another proven 'Goodness of Fit' for study model.

6.5. Partial models and full model for significant hypotheses statements

Table below provided the summary magnitude values regression coefficient of partial and full models to the study significant hypotheses statements.

Summary comparison of magnitude value for model's regression coefficient (Table 1).

Model	Construct	Regression Coefficient (B)	Significant Value	Regression Type	Variables value
1	POT	0.143	0.03	Multiple Regression	Metric
	PDN	0.131	0.032		
	AMD	0.401	0		
2	MTS	1.800	0	Logistic Regression	Metric and nonmetric
3	POT	1.429	0	Logistic Regression	Metric and nonmetric
	PDN	1.257	0.003		
4	POT	1.273	0	Logistic Regression	Metric and nonmetric
	PDN	1.146	0.008		
	MTS	1.207	0.016		

There were 8 of supported hypotheses statements in significant value p<0.05 and 11 of not supported hypotheses statements in not significant value p > 0.0. Thus, the partial model 1 standard multiple regression coefficient estimate equation is:

$$YMTS = 0.60 + 0.143POT + 0.019GWM + 0.131PDN + 0.130AGT + 0.162ADP + 0.401AMD$$

The full model logistic regression coefficient estimate equation is:

$$ODDSDTA = e{-}10.852 + 1.273POT + 0.110GWM + 1.146PDN + 0.001AGT + 0.393ADP - 1.233AMD + 1.207MTS$$

7. Discussion and Conclusion

7.1. Regression Hypotheses Statements relationship between POT and MTS; and Digital Technology Adoption

The hypothesis statement of H1a: perception of technology has a positive relationship with management team support is supported by its significant p-value = 0.003 in Model 1. Means that the inventing of technologically systems which can be controlled and directed its ease for usefulness in mankind lives but also brought up threaten as well [17]. Thus, the management team is encouraged to implement strategy actions associated with co-ordination and persuasion for their employees to attend the educational courses either on-line or face to face in physical classes that advocated by management team support. In further, argued that these co-ordination and persuasion for transformation process

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can be brought yield results from initiatives adopt digital innovation to improve organisational business process [4], supply chain efficiency, agility and sustainability which have become a necessity for market share competitiveness.

The regressed hypothesis statement outcome of H4a: Management team support as mediator role between perception of technology and digital technology adoption; its p-value < 0.001 is supported in model 4. It is analysed result by logistic regression tested of the study model, the respondent Group 1 (high digital technology adoption) odd value is 3.6 times higher than Group 0 (low digital technology adoption) in p<0.001 significant value. It was explained that an additional 1 unit increased in Perception of Technology (POT) element that used original logistic coefficient value 1.273 to calculate classify of group digital technology adoption either for '0' or '1' with all other factors being equal control. Arumugam A et al. cited worked of Islam et al., (2015)[18], the new technology adoption occurs as same rate as grapevines in an organisation context. Leader of all organisations needed to guide him /her team members to understand and participate in the vision, priorities and road map for the transformation when introduced a new technology. Thus, the assessing methods for evaluating expertise is necessary that push others in the same direction but must first to consider by organisations leader.

However, leadership quality relatively affected the growing awareness of leadership efficacy through the utilization of a digital technology paradigm. It is because leader's leadership efficiency could mediate the relationship between perception of technology and digital technology adoption [19]. Maroufkhani, et al. studies where the negative perception of top managers on Big Data Analytic adoption (BDA) due to their initial view of the complexity and difficulty of adopting BDA [20]. They also cited the works of Vagnani and Volpe (2017) showed complexity indirectly affects technology adoption decisions through the attitudes of managers and decision makers.

For regressed hypothesis H6a: perception of technology has a positive relationship with digital technology adoption; its p-value < 0.001 supported in model 3. Effendi AP, et al. study and stated that the adoption of e-commerce by small entrepreneurs is positively and significantly influenced by organisational readiness [21]. As such in preliminary stages embraced technical capabilities talent pool, ease to available resources and associated with trading partners who literacy in using technology systems. Effendi, et al. recited studied of Saridakis et al. (2018) explained that adoption of e-commerce can help to generate new revenue streams for SMEs as well as income earn through their physical sales [21]. Thus, SME managers and top-level management teams were recognized digital technological systems only way for ensuring their businesses survival.

7.2. Regression on the Hypotheses Statements and its relationship between PDN and MTS; and Digital Technology Adoption

The model 1 showed the result of metric variables analysed by multiple regression for hypothesis statement H1c: Perception of disruptive innovation has a positive relationship with management team support. This statement is supported by its p-value = 0.032 derived. Chen, et al. their paper discussed the issues related to the disruptive innovation of latecomer firms who leveraged top management team support [22]. Their study found that enrich and expand the connotation dimension of the disruptive innovation theory and provide theoretical guidance for latecomer firms in developing countries to identify innovation opportunities, expand to a new blue ocean market, and successfully compete in the new marketplace. It will break through the leading

market main-consumer segmentation.

Lyu showed through a quantitative approach on a sample of Italian firms in the food industry that firm's market-based sources are usually associated with income from incremental innovation and time to market [23]. This would help the management team to perform in tremendous innovation processes. Chen et al. who applied past research study was found that the subsidiaries of the parent company with superior knowledge and capabilities were far more effective in using Research and Development (R&D) and subsequently enhancing this capability to improve their innovative performance [22]. Crupi et al. studied explained that the integration of innovation could lead to a sustainable competitive advantage from supported employee training and development programs as fundamental knowledge management tools [24]. It can encourage the firm's top management shifts toward innovation within the field of environmental protection [25].

The model 4 provided the full model logistic regression analysed result to Perception of Disruptive Innovation (PDN), which shown statistically significant p-value = 0.008 and its 3.1 time odds value with original logistic regression coefficient value 1.146. This indicated that a respondent whose characteristic is prone towards the perception of disruptive innovation, he/she is tendency falling to Group 1 'high digital technology adoption' in prediction. The suggested prediction for every additional 1 unit change in factor perception of disruptive innovation, the odds of him/her falling into group 'high digital technology adoption' would be 3.1 times higher than those respondents falling into Group 0 'low digital technology adoption', all other factors being equalled control.

It is supported hypothesis statement H4c: Management team support as mediator role between perception of disruptive innovation and digital technology adoption. This study outcome aligns to Christensen's theory of disruption which involved certain growth-curve concept of an organisation [26]. In nature, those start-up organisations in early growth-curve phase eventually either ceased extinct in market, or persistence innovation processes adapted continually into a new growth-curve of products and services for purpose survival in marketplace. Nevertheless, organisational leaders who prioritize phases of market growth over other considerations, such as cultivating diversity of cognitive perspectives and mindsets among individuals within the organization, may inadvertently overlook a crucial aspect of organisational vitality [4]. Maroufkhani et al. study found that organisational readiness does not influence technology adoption directly [19]. They empirically tested the mediating effect of top management support and found that the influence of organisational readiness on BDA adoption could be mediated via top management support. Therefore, businesses were required to shift into new business model and such initiatives required the support from senior managers.

The model 3 showed the result of logistics regression to test the hypothesis H6c: Perception of disruptive innovation has a positive relationship with digital technology adoption. This statement is confirmed supported by its p-value = 0.003. The findings were aligned to Dutta et al. studied of the functional area which can potentially leverage Industry 4.0 technologies and help India's manufacturing establishment to transform. The maturity survey revealed several insights in context of Indian SMME community's through self-assessment and indicated their operational measurements. Therefore, manufacturers are advised to capture the real-time data and then perform an analysis to incorporate the results of improvement in manufacturing. Rupeika-apoga, Petrovska, & Bule (2022), their research indicated that increased levels of digital orientation and capability, which are intermediated by digital transformation, resulted in significantly higher revenues and intricate business model. Thus, digital transformation empowers SMEs to rethink the way they make decisions

such as choice of growth curve phase by senior managers on leveraged technology in meaningful and sustainable ways through perception of disruptive innovation.

7.3. The regression hypothesis statement of relationship between MTS and Digital Technology Adoption

The p-value < 0.001 derived from model 2 supported hypothesis statement of H3: Management team support has a positive relationship with digital technology adoption which tested by logistic regression. In fact, the management team support acts as a major accelerator to change various facets of the company function process, which elevates the expectations of Malaysia SMEs for continuous development in digital era [27]. Thus, the management team's strategic vision and competency would help allocate necessary resources, define the decision-making processes, implement the appropriate digitisation strategies, address the digitalisation gap and attract external support [28]. The management team support is essential to lead the employees to a culture of interconnectedness and information transparency for routine daily job activities performed Dutta et al. In reason for resolving the limitation of SMEs possess resource infrastructures and financial perspectives, Cenamor et al. research paper was mentioned and advocated SMEs entrepreneurial management team should deploy the agents whom provide a platform ecosystem which can share and use common resources and knowledge [29], while leveraging unique resources by creating new complementary modules. Pizam et al. deployed factors research studied regarded top management support as an important factor in influencing managers' intention to adopt robotic technology [30]. As such promotes managers intention of new technology adoption and the utilization of AI supported technologies to drive the business as strategic decision; and requires substantial strategic investments [19]. If top management is willing to invest funds for the digital technology systems and open to taking risks, then the SMEs managers will have higher intention of adopting digital technologies.

7.4. Regression hypotheses statements relationship between AMD and MTS; and Digital Technology Adoption

The hypothesis statement H2c: Ambidexterity has a positive relationship with management team support with (B = 0.401; p<0.001) from model 1by standard multiple regression tested. Cenamor et al. have explained the ambidexterity capability of organisation is combination of twin orientations method [29], which consists of exploratory and exploitative features would be the baseline and the key driver of innovations. SMEs depend on the direct supporting from management team to implement ambidexterity strategy due to SMEs companies' lack of hierarchical systems. SMEs can be responded quickly to the changing environment because their management team members not only make decisions but also execute these decisions as well. Tsai and Ren research have indicated that the senior management team will serves as the interface between the organisation and its environment which catalysed by ambidexterity [31]. They indicated that individual management team personal attributes will be importantly factor choice of strategic ambidextrous. This is because their various and complimentary thoughts can strengthen the company's ability to address the issue at hand. The professional knowledge of SMEs manager team members possess can be influenced decisions made by top management in more carefully considered, fair distribution of resources, and SMEs will be better able to achieve strategic ambidexterity. Obviously, this would be created a new variety of openness and co-creation needs for customers, wider networks and ecosystems business advocates. Further, the role of customer-centricity would be instilling emphasized, as well as the need for building and maintaining networks and partnerships [32].

8. Conclusion

The successful of SMEs digital transformation to leverage digital technology adoption is substantially needed co-operation jobs within company managers and employee participatory. The study variables encompass perceptions of technology, perceptions of disruptive innovation, and management team support for digital technology adoption. However, it is important to note that in the standard regression analysis, ambidexterity only demonstrated a partial significant relationship with management team support. To enhance the validity and accuracy of the analysed results, it is recommended that further research could benefit from the inclusion significant regressed results of independent variables such as growth mindset, agility, adaptability, and ambidexterity.

Lastly, it should be noted that SMEs have unique characteristics, including limitations in agility when compared to larger companies. However, decentralized structures, fewer bureaucratic policies, and a tendency to adapt quickly to government-mandated regulations are often observed in SMEs. Obviously, SMEs can thrive in digital transformation when present with government support, including financial grants, tax relief, free of digital training programs for employees, and mentoring from digital providers. Such support mechanisms can guide SMEs towards success in their digital transformation journey over time.

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