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4th Industry Revolution Digital Marketing Adoption Challenges in SMEs and its Effect on Customer Responsiveness

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Abstract: The 4th industrial revolution of cyber-physical technologies (4IR) intersecting digital technologies and entrepreneurship serves as an external stimulus in fostering a new method of venture creation transforming customers' purchasing and consuming behavior. Whilst large corporations are taking the lead in leveraging on 4IR digital marketing (DM) for their marketing strategy, studies have shown that small and medium enterprises (SMEs) are lacking behind. This study explores the conundrum using an exploratory sequential mixed method. Semi-structured interviews were carried out on a sample size of ten SME participants selected using non-probability purposive sampling and determined through attaining thematic saturation of discursive patterns. Scale development for quantitative instruments was performed using SPSS statistical software v22. A quantitative study was carried out on a sample size of 153 SME respondents. Analysis was undertaken using SPSS supported by paired-samples T-test. Kuskal-Wallis H test and Spearman's rho correlation test due to the nonparametric nature of data distribution. The outcome reveals that although SMEs are increasingly reliant on DM for their marketing strategy, most of these SMEs are only willing to invest in building low-level DM capability citing a lack of financial budget, inadequate technology infrastructure to support such setup, cyber security issues and lack of DM knowledge. Financial budget and technology infrastructure are considered the most critical concerns by SMEs with low and moderate DM adoption. However, these concerns are less pronounced in SMEs with high DM adoption. Finally, the weak but significant correlation between SMEs' DM adoption and customer responsiveness infers the significant role of 4IR technology as an enabler of digital marketing strategy that also depends on other critical contributing factors such as price and quality.

Keywords: *4IR; digital marketing; 4C's; SME; exploratory sequential mixed method.*

1. Introduction and Background

Digitization has changed the nature of entrepreneurial activity by adequately contributing to personalize marketing. The industrial revolution has made available a huge amount of information and depending on how this information is used could positively or negatively impact the trust-building factors of the business and their customers. Although digital marketing is not new to Small and Medium Enterprises (SMEs) the usage is rudimentary around products and brand promotion on popular internet and mobile apps and social media sites favored by younger generations. Malaysian Communications and Multimedia Commission (2018) reported that the percentage of Internet users at the national level has risen from 76.9% in 2016 to 87.4% in 2018. Nine out of ten Internet users are now using smartphones (93.1%) to go online. This survey is a testimony of the increasing influencing power of disruptive technology on the purchasing pattern of consumers. A trend SMEs simply cannot ignore. In the context of this study, SMEs is defined as small to medium enterprise under two main categories. In the manufacturing category, SME is defined as sales turnover not exceeding RM50 million or the total number of full-time employees not exceeding 200. SME in Service and Other Sectors category is defined as having a sales turnover not exceeding RM20 million or a total number of full-time employees not exceeding 75 (SMECorp Malaysia, 2020).

In addition to the changing consumer spending pattern, 4th Industry Revolution technology (4IR) combines engineering practices with powerful technological tools such as big data analytics, additive manufacturing, cloud computing, and internet-of-things (IOT) revolutionizes digital marketing shifting the way traditional mass marketing and digital marketing work. The new marketing era is moving towards personalized marketing requiring providers to stay connected, agile, proactive, and intimate with their target market. Although the Malaysian government through its Industry4wrd readiness assessment has allocated RM210M from 2019 to 2021 to support SME 4IR readiness (Malaysia Productivity Corporation, 2019), it is yet proven a success. A previous study (FMM ICT Adoption Study, 2016) has reported that 20 percent of SMEs use Information and Communication Technology (ICT) applications actively. However, only 16 percent embark

on e-commerce activities. Despite the incentive by the Malaysian government, just between 10 and 15 percent of SMEs have successfully taken steps to adopt 4IR. For most parts, these SMEs do not have a choice due to their dealing with tier-one MNCs (Mok, 2019). It is intriguing that given the incentive and a shifting socio-economic and technological paradigm, SMEs are still struggling to adopt 4th industry revolution digital marketing (DM). This study intends to further explore these conundrums and the effect of DM on SMEs' customers.

2. Literature Review

The introduction of 4IR which focuses heavily on interconnectivity, automation, machine learning, real-time data and smart digital technology has raised the standard of marketing capabilities. Digital marketers now have the ability to access limitless digital content and channels building better brand positioning and leveraging on specific needs of social media communities (Digital Marketing Institute, 2017). Marketing strategies are no longer about the 4P's of product, price, place, and promotion but the new 4C's of Co-creation, Currency, Communal Activation, and Conversation which represent a revolutionary model of brand-to-customer communication (Pamastillero, 2017). In this model, companies involve customers early during the ideation stage in the Co-creation process to customize and personalize elements according to their community needs. Pricing, like Currency, is set dynamically depending on the spending pattern of the consumer and customizes according to the customer's historical purchase pattern and the proximity of prospects' location to the store. Distribution is carried out using Communal Activation which leverages 3D and online portals to allow customer access to products anytime and for the products delivered directly to your doorstep. Selling is no longer a passive object of convincing customers of the merits of your products but multiple ways of engaging with your customers. Conversation can further enhance DM providing companies with in-depth analytics and search engine rankings.

To page views, likes, and comments that eases their engagement with customers (Digital Marketing Institute, 2017). From the consumer perspective, this revolutionary digital marketing increases their authority as consumers get to enjoy and reap the benefits of unparalleled freedom in selecting media and entertainment options according to their preferences. With the power of cloud computing facilitating on-demand data storage and computing system resources, digital and social media platforms are no longer restricted and confined to the limitation of their computing capacity. It led to a change in software development behavior of focusing on quality rather than worrying about storage limitations. The plethora of new mobile and web cloud apps that provide convenience and ease of use have captivated the interest of digital users resulting in the high dependency of consumers on digital electronics in their everyday life (Lekhanya, 2015). Business uses this opportunity to reach and capture the interest of potential customers globally through the simultaneous use of multiple digital platforms. Mogos (2015) postulated that firms and manufacturers are progressively implementing digital marketing to capture and respond positively to the profusion of choices and ever-changing needs of consumers whilst building and improving existing customer relationships. Having a better understanding of consumer needs and preferences would lead to product differentiation and innovation of new products and services.

Simmons, Armstrong and Durkin (2011) identified four key factors that are likely to influence the adoption of websites and technology. These elements include the owner-manager's willingness to embrace technology and the opportunities it offers, a procession of an "e-Vision", the ability in understanding customers and their needs on how they might want to engage with the business online and having an online value proposition that takes the form of information on products and services but with customer feedback mechanisms. However, these factors do not account for the low adoption rate of DM among SMEs compared with tier-one corporations (Jones, Alford and Wolfenden, 2015). The difficulties with embedding DM stemmed from several reasons. The notable ones are employee resistance, a lack of technical 'know-how' (Leeflang, Verhoef, Dahlström & Freundt., 2014) and a lack of marketing competency, along with all the other associated limitations of a small business (Xiang & Gretzel, 2010) such as lack of finance, lack of business resource (Thompson et al., 2013). The Technology-Organization-Environment (TOE) framework based on the elements of technology, organization, and environment seems more apt in explaining technology adoption decisions (DePietro, Wiarda & Fleischer, 1990). Whilst external task environments such as industry and market structure, technology support infrastructure, and government regulation form the environmental context.

Organizational context includes the firm size, resource availability, and linkages among employees. The final element of Technology infers the availability and characteristics of both the internal and external technologies relevant to the firm. These three elements present "both constraints and opportunities for technological innovation" that influence the way a firm adopts new technology (Tornatzky and Fleisher 1990). Whilst it is not disputable that the identified challenges are banes to SMEs' adopting DM, not investing would impede their ability to grow their bottom line. Studies such as have indicated a correlation between the use of digital technology and a company's growth. This literature seems to infer a myopic attitude on the part of SMEs that focus on short-term results which begs the question of whether this line of thinking ramifies the slow adoption of advanced technology among SMEs. In our attempt to answer the question, two objectives were established:

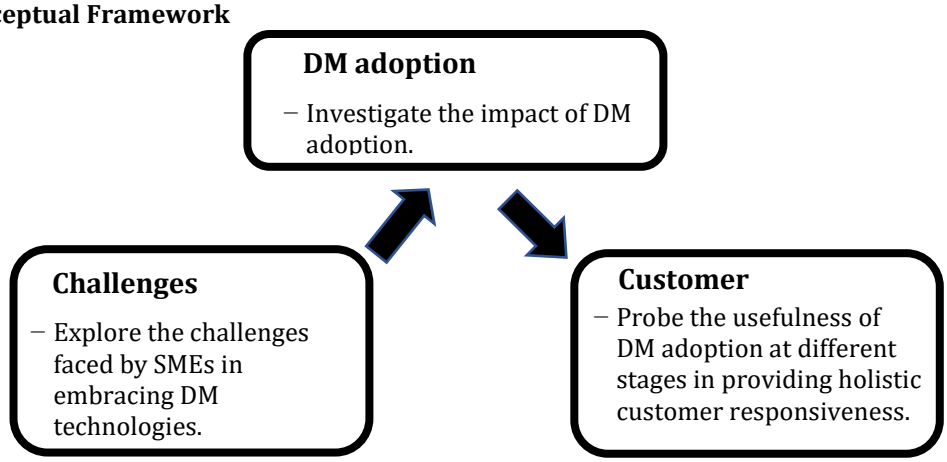
- Explore the challenges faced by SMEs when investing in DM for long-term profitability.
- Investigate the impact of DM adoption in small business organizations.

One key role of DM is as a support mechanism for enterprises to develop and strengthen their relationships with customers (Alford & Page, 2015). It's about caring for customers, listening to their needs, and finding the right solution that would build an emotional connection between the customer and the brand (Morgan, 2018). Having the right marketing strategy enables small businesses to create values and build brand loyalty while strengthening the business' competitive position both locally and abroad (Correia, et al., 2016). Deployment of DM further increases the effectiveness of customer care by providing quality information, individualizing information, and enhancing the quality of data disseminated to the target market. Having such actions would enhance business reputation, develop innovative products and services that would drive up sales and increase efficiency while assuring the reliability of product images and reduction in cost intended for traditional marketing tactics. Although the benefits of DM adoption are not disputed, what specifically lacking is how adopting 4IR digital marketing in SMEs affects their customer responsiveness. This question forms the third research objective which is to probe whether SMEs utilizing DM could effectively respond to market needs, create better brand awareness, and build superior and holistic customer care collectively made up of customer responsiveness (Signpost, 2022).

3. Research Methodology

From the arising research questions, three qualitative objectives form the core of this study:
QLRO1: Explore challenges faced by SMEs in embracing DM
QLRO2: Investigate the impact of DM adoption in small business organization
QLRO3: Probe the usefulness of DM in providing holistic customer responsiveness.
Based on these objectives, this study hypothesizes the research's initial themes through a conceptual framework (Figure 1) prior to data collection and supports them with evidence gathered from the data in the form of codes (Byrne, 2022).

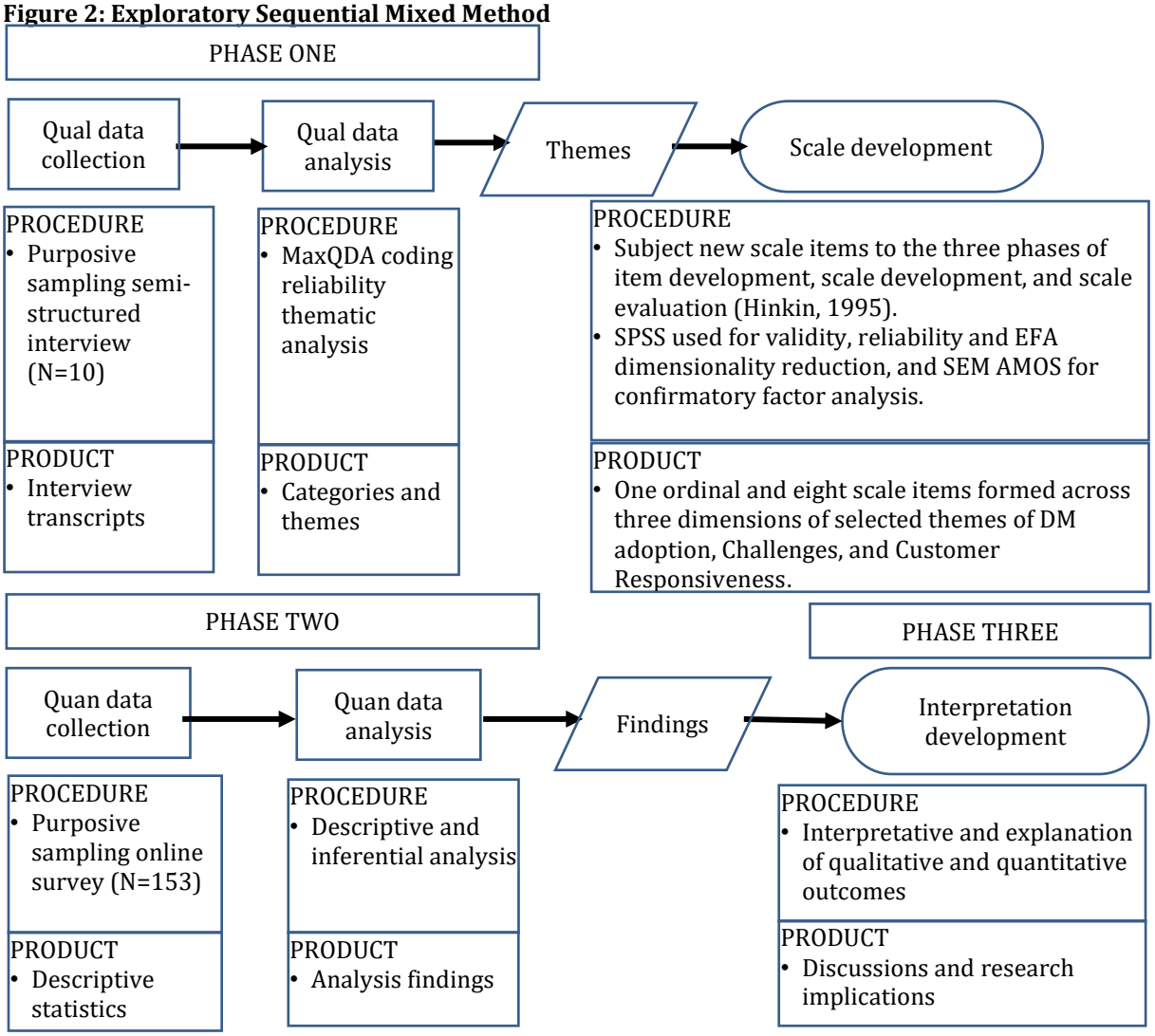
Figure 1: Conceptual Framework



The construct of DM adoption forms the core of the framework affected by its environmental challenges and influences the construct of customer responsiveness.

Exploratory Sequential Mixed Method Approach: This study explores the conundrum using the three-phase exploratory sequential mixed method study design (Figure 2). The first phase is an inductive exploratory primary qualitative phase in which data collected from purposive sampling semi-structured interview was analyzed using MaxQDA coding reliability thematic analysis (Hinkin, 1995). Based on the core themes, the scale development process was carried out to transform domain items into scale items for use in quantitative studies to triangulate the qualitative outcome (Greene, Caracelli, & Graham (1989). The second phase involves using a similar non-probability purposive sampling technique by sending emails to SME representatives and inviting them to complete an online survey. The sample was analyzed using a combination of descriptive and inferential analytical methods. Although the non-probability purposive sampling method is commonly used in qualitative research to identify and select participants who could provide related information-rich cases, it can be used for both qualitative and quantitative research techniques (Palinkas et al., 2013). In the final integration phase, findings from both qualitative and quantitative studies were collated and interpreted to explain the outcomes that connect both strands of data (Fetters, Curry & Creswell, 2013).

Figure 2: Exploratory Sequential Mixed Method



4. Analysis

Phase One: Inductive Exploratory Approach: In the exploratory qualitative phase, participants (Table 1) were selected for their DM knowledge, and their companies having implemented some forms of 4IR digital marketing tools. The interviews that took place at the onset of the Covid-19 pandemic in Malaysia involved

participants who were either founders or senior managers of SMEs located in Shah Alam, the state capital of Selangor in Malaysia.

Table 1: Participant Profiles

Actor	Industry	Roles	Company Registration Date
A	NLP consultancy, B2B	Founder	2010
B	Sportswear manufacturer, B2C	Founder	2012
C	IT services, B2B	Founder	2009
D	Food and beverages supplier, B2B	Founder	2014
E	Power tool distributor and supplier, B2B and B2C	Senior Manager	2007
F	Fashion designer and manufacturer, B2C	Founder	2008
G	Education services, B2C	Founder	2011
H	Green technology, B2B and B2C	Founder	2006
I	Financial services, B2C	Founder	2010
J	Trading (jewelry), B2B	Founder	2014

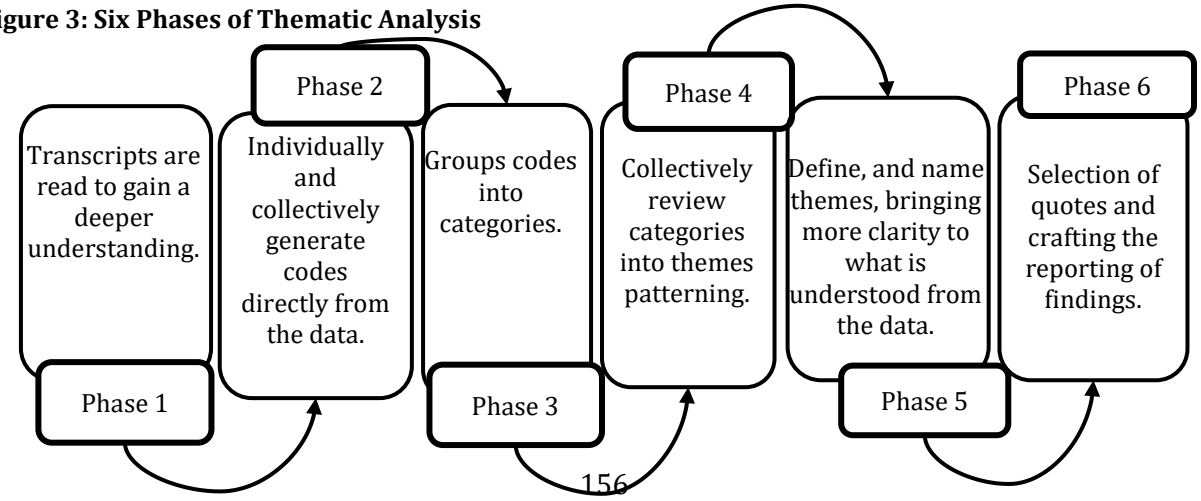
The sample size was determined through the attainment of thematic saturation of discursive patterns (Morrow, 2005) and consistency and repetition of findings (Vasileiou, 2018) from an encompassing examination of incremental sample data collected during interviews. As the study has a narrow scope around the three mentioned objectives, we were satisfied after having interviewed the tenth actor that we have achieved the desired thematic saturation and consistency of discursive patterns. Prior to the interview, a pre-test was carried out internally to verify that the questions used for the interview are well understood and do not make respondents feel uncomfortable or confused. These questions were created based on the research conceptual framework (Table 2).

Table 2: Questions

Semantic Themes	Question
Challenges	Can you share some of the difficulties your company faced with embedding 4IR digital marketing into your marketing strategy?
DM adoption	How would you describe the adoption of 4IR digital marketing in your company?
Customer responsiveness	What is the impact on performance, effectiveness, efficiency and creativity after implementing 4IR digital marketing?
	Has 4IR digital marketing positively or negatively affected your relationship with your customers?

Data collected was analyzed using thematic analysis (TA) which uses a flexible process to provide valuable, comprehensive, and complex descriptions of data (Vaismoradi, Jones, Turunen, & Snelgrove, 2016). As the central focus of the study is to explore and examine the generalized semantic themes, an inductive approach was used to seek and examine if "generalizations" can be drawn by going from the specifics. TA comprises a six-phase process 1. Data validation, 2. Initial code generation, 3. Categories generation, 4. Themes patterning, 5. Defining and 6. Naming themes and reporting of findings (Maguire, 2017) (Figure 3).

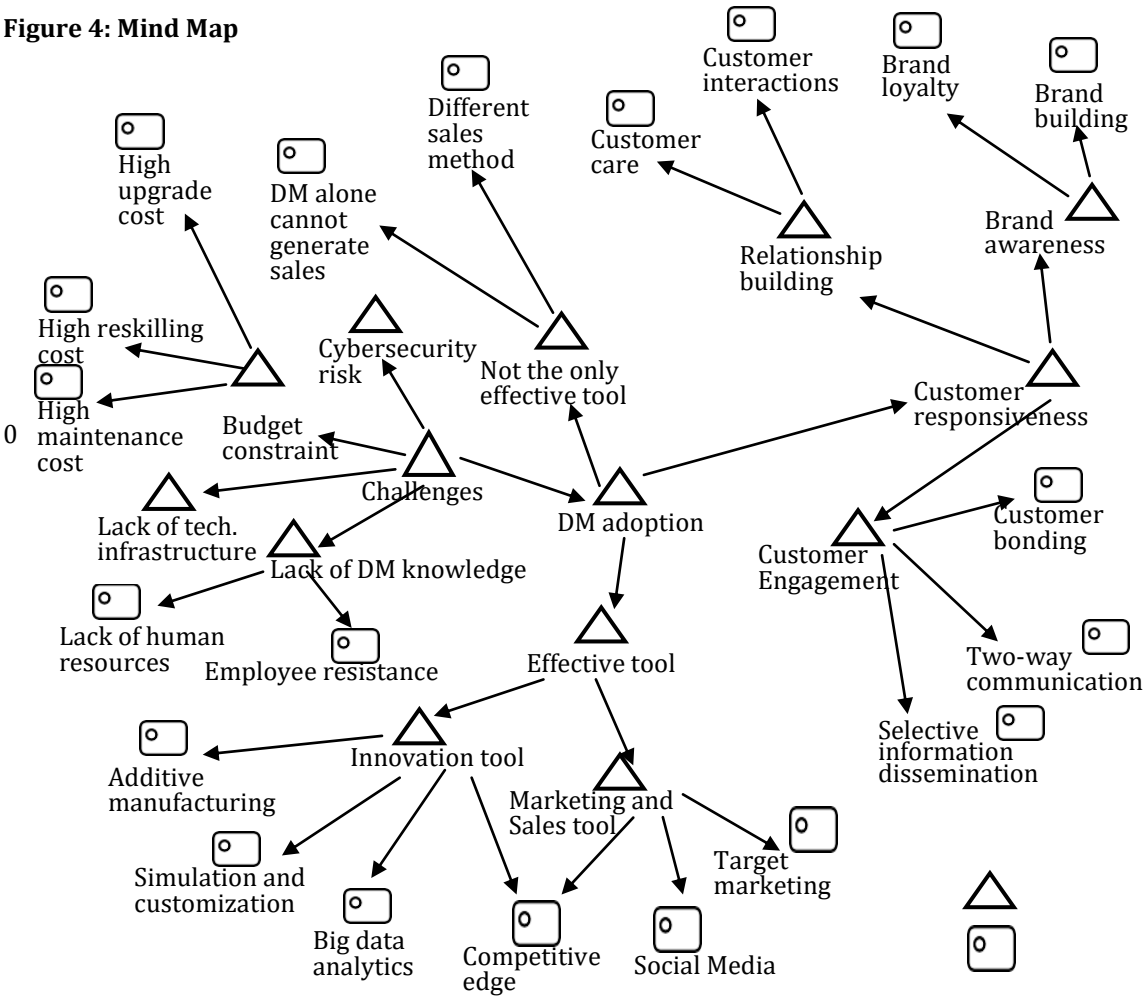
Figure 3: Six Phases of Thematic Analysis



Initial Coding and Labeling: The actual interview session was audio recorded after assuring respondents of the descriptive validity of the data collected and receiving their consent. The data including non-verbatims were transcribed and verified by an independent party before the participants were asked to give their concurrence that the contextualized data is in accordance with the conversation and observations captured during the interview. Initial codes were generated based on keywords and patterns of the participants' statements. The labels represent the important features of the data and thus, help to summarize and synthesize the responses. Labels that are congruent in meaning are kept in the same category or subcategory to help with the provision of details for analytical theme development (Vaismoradi et al., 2016).

For example, to the question "What is the impact on performance, effectiveness, efficiency, and creativity after implementing 4IR digital marketing?" participant F responded, "So to sum it up, it is a vital marketing tool for companies to innovate and build a competitive edge in the market." Accordingly, from the three keywords "vital marketing tool", "innovate", "competitive edge" extracted, "vital marketing tool" was placed under "Effective tool" category and labelled as "Marketing and Sales tool" and "competitive edge" label placed below "Marketing and Sales tool" indicating the superiority of the tool. "Innovate" on the other hand was placed under "Effective tool" category and labelled as "Innovation" indicating the creative use of the different 4IR technologies. These labels were further scrutinized on the meaning of their codes and how they relate to one another. Related labels were collapsed to form categories for more efficient analysis. As a result, twenty labels and fourteen categories and subcategories were created in the mind map (Figure 4).

Figure 4: Mind Map



Challenges: The first of the broad categories is "Challenges". Broad category groups are associated with subcategories of the central phenomenon or concept in a study. This "Challenges" broad category is made up of issues that are detrimental to the adoption of DM expressed in the question: "Can you share some of the difficulties your company faced with embedding 4IR digital marketing into your marketing strategy?" Almost all participants agreed that the most prevailing challenges are a financial constraint. Participant A expressed: "Company has to spend millions in upgrading their technology, reskilling workers, and employing new talent when embarking on further DM upgrades and that does not even include the post-upgrade maintenance cost". Participant B concurred saying: "Limitation on the budget" is hindering their ability to reskill the "whole company to mentally and physically prepare the employees". SMEs unlike big corporation are at most time running on shoe-strung budget that is barely enough to cover their day-to-day operation. The additional cost brought about by technology upgrades would further strain the sustainability of their business without any guarantee of return on their investment. Asides from budget constraints, there is consensus that SMEs are hampered by the lack of DM knowledge and technology infrastructure in managing advanced technology.

Participant G said: "We don't have enough skilled employees relying on a few workers including me (the founder) to perform multi-tasking duties". To excel, "we (SME) need to spend lots of time and effort not to mention the cost to keep our systems and technology infrastructure up to date, create quality contents, build algorithms and online relationships in an ever-changing marketing process that we could barely afford given our resource constraints". Participant H asserted: "Upgrading technology infrastructure is very costly. We spent a lot in getting our infrastructure ready to support cloud computing and simulation because of the need to comply with the advanced technology standard of our large client". The final challenge that was raised by participants is a cyber security risk. There is fear amongst SMEs that automation of their marketing strategies would risk information pilferage. New technologies have design flaws and vulnerabilities that could be exploited by technologically advanced criminals. Security compromise can have a devastating effect on small businesses since they do not have the capabilities and resources to recover from such attacks. Participant C reacted: "If the company and customer's data and information is leaked …dragging our reputation down…lose its customer's loyalty and... destroy the company". Unless pragmatic solutions can be found to alleviate the concerns of cyber attacks, the loss of confidence would further serve as a setback to SMEs adopting DM. It is noted that these companies are using different levels of DM for their marketing strategy.

Digital Marketing Adoption: The adoption of DM forms the second broad category. The data were analyzed based on responses given to the question: "How would you describe the adoption of 4IR digital marketing in your company?" Two subcategories were formed. The first is "Not the only effective tool". Whilst most see value in using the tool, a few of the participants are of the opinion that 4IR digital marketing tool is not the only effective tool. Participant C opined: "For some B2B, having just technology-driven digital marketing is not enough due to the large spectrum (different ways) of doing business". Participant A concurred stating: "There is no evidence to suggest that digital marketing capabilities alone bring in new customers". He further states that "customer conversion is a result of a few factors primarily pricing and quality of products". Although there are currently not many studies that empirically determine the correlation between DM and new customer acquisition, studies such as the 2019 Digital Marketing Survey Results (Powderkeg, 2019) have postulated the importance of digital marketing as an effective lead generation tool. Another Study has indicated that on average, the conversion rate for lead generation in B2B business is between 5% and 10% (Rivard, 2016).

For well-designed digital marketing, the conversion rate can even go up to 25% (Ortner, n.d.). These studies as well as others infer the effectiveness of digital marketing in generating leads and that more leads would invariably result in higher chances of customer conversion. The other subcategory is using DM adoption as an "Effective Tool". Most participants found value creation in using DM for innovations and developing a business competitive edge. In support of innovation as an effective tool: Participant H asserted: "We use algorithms that our data analytics experts have created to analyze data from many different sources to examine market trends that help drive our green marketing campaign". Participant I opined: "We interact with our customers and respect their opinion, so it (opinion) helps in customizing our services using computer simulation". Participant F stated: "Staying connect(Ed) with customers and then have the marketing team works with our fashion designers to create 3D printing of new designs". In support of using DM as an effective marketing and sales tool to develop a business competitive edge, all participants agreed

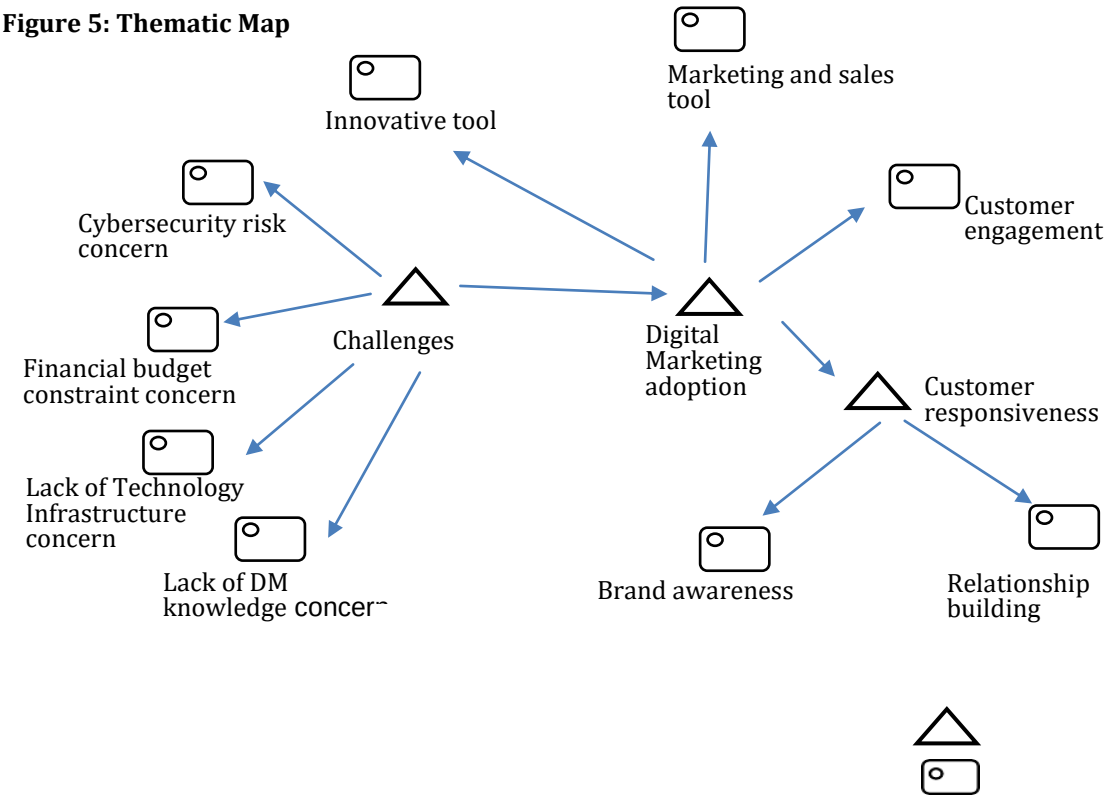
that it has a major role in their social media marketing in promoting content and generating sales leads. It is also a great target marketing tool for selective information dissemination.

Effect of DM on Customers: The third and final broad category is the effect of DM on customers. Although all participants saw value in using DM, there is still the question of its effect on consumers which is assumed in two associated sub-questions: "What is the impact on performance, effectiveness, efficiency, and creativity after implementing 4IR digital marketing?" and "Has 4IR digital marketing positively or negatively affected your relationship with your customers?" There was consensus among almost all participants of a positive impact including building relationships, generating brand awareness, and engaging with customers. In support of customer engagement: Participant D replied: "DM is a very efficient way for us to connect with the customers and for them to give suggestions, and comments for improvement ".
Participant I opined: "We interact with them and respect their opinion, so it (opinion) helps in customizing our services using computer simulation creating a bond between us".

In support of brand awareness:
Participant F stated: "Having additive manufacturing in the form of 3D printing boosted my brand and helped (achieved) go-to-market strategy creating brand awareness and loyalty".
In support of building relationships:
Participant E reflected: "Using DM helps us establish close interactions with our big corporate clients, especially in supply chain management."
Participant J concurred: "With the use of advanced technology tools, we can be more empathy to our customer needs…providing high-value products shows that we genuinely care for our customers".
Based on the participants' responses, three associated subcategories of relationship building, brand awareness, and customer engagement were developed and consolidated under the broad category of "Customer Responsiveness".

Themes Patterning: In the final stage of our analysis, we rationalized the categories into designated distinct themes by identifying, analyzing, and interpreting patterns of themes within the qualitative data (Maguire & Delahunt, 2017). It results in the extraction of three major themes and nine categories (Figure 5) from the initial list of categories and coded labels.

Figure 5: Thematic Map



Theme 1: Digital Marketing Adoption: At the core is the "Digital Marketing adoption" theme that is used primarily to investigate research objective QLRO2 on the impact of SMEs adopting DM. From a semantic theme standpoint, DM can be an effective marketing and sales tool for personalizing and customizing a company's products and services in accordance with market needs. However, the latent aspect of the theme infers that SMEs have yet come to terms with the industrial revolution of advanced technology. This is reflected by their hesitation to upgrade and expand on their DM especially during the Covid-19 pandemic citing the identified challenges despite acknowledging the superiority of the advanced technology. As SMEs are running on a shoe-string budget, most are not willing to take risks and will only do so when their retained earnings allow them to increase the financial budget.

Theme 2: Customer Responsiveness: The other aspect of our research objective QLRO3 is to probe the usefulness of DM adoption in providing holistic customer responsiveness. The semantic theme indicates a general agreement amongst participants that DM is a great tool for engaging with customers, building relationships, and establishing brand awareness. However, relationship building, innovations and brand awareness alone may not translate into sales as buying decision process depends on other critical factors such as price and quality (Yong & Renganathan, 2019). The latent theme infers that branding must be accompanied by innovations that strive on price to quality consideration to achieve positive customer responsiveness. It's about caring and fulfilling the needs of customers at every touch point he or she has with the company. Having holistic customer care goes a long way toward mitigating churns and generating repeat sales and customer referrals. This strategy is cost-effective as studies have shown that companies are spending five times more acquiring a new customer than retaining an existing customer (Wertz, 2018). Using "Customer responsiveness" as the theme appropriately reflects the inductions of both semantic and latent in that it establishes an emotional connection between the brand and its customers and holistically addresses the needs of its customers.

Theme 3: Challenges: The final research objective of QLRO1 is to explore challenges faced by SMEs in embracing DM. Findings indicate that SMEs are facing various concerns about expanding their existing DM capabilities. Apart from the two participants, most are reluctant to upgrade and harness the power of 4IR technology despite acknowledging its benefits citing several reasons. First is the financial budget constraint concern that SMEs with their limited budget find the high transition cost difficult to bear. There is also the automation cost associated with setting up technology infrastructure including license fees, the need for huge data analytic storage, and engaging IT consultants. Moreover, relieving workers from duty for reskilling and upskilling training would leave a void that is critically needed in operation and revenue-generating activities which leads to the second concern of the lack of DM knowledge. In a thinly spread organization of typical SMEs where every employee is expected to multitask, specialization and employees resisting new technology would have a negative impact on the organization's depleted resources.

Although these happen in big corporations, the impact is circumvented by the larger pool of resources. Big corporation also has the financial clout of hiring technical experts for their technical work. Unfortunately, SMEs do not have the same luxury. Having inadequate DM know-how resources would seriously undermine the ability of SMEs to move forward with automation. Third is cyber security risk concern. Most SMEs are equipped with basic malware protection. As the full-scale DM model requires huge data storage more economically solicited through cloud computing, the transmission and storing of sensitive information in the public internet cloud have raised a concern. Although cloud providers such as Amazon Web Service or Microsoft Azure offer security tasks such as monitoring, patching, and incident response (Dekker & Liveri, 2015) the security protection is confined to the internet cloud service providers whilst SMEs' own IT infrastructure continues to be exposed.

Scale Development: Having accomplished the three qualitative research objectives, two clarifying questions arising from the study that required confirmation. One, we were unable to determine the magnitude of these challenges. For instance, do SMEs have the same level of concern for all challenges or does the level of concern varies across different stages of DM adoption? Two, what are the linkages between different stages of DM adoption and customer responsiveness and how tightly coupled are these linkages? We intend to resolve these clarifying questions through the formulation of two quantitative research objectives:

QTRO1: Examine the level of concern of the challenges within each stage and across different stages of DM adoption.
QTRO2: Determine the linkage between different stages of DM adoption and customer responsiveness.
As part of the sequential explanatory mixed method framework, the scale items used in resolving the clarifying questions were developed via the three stages of item development, scale development, and scale evaluation (Hinkin, 1995). Adoption of the DM theme was set up as an ordinal scale following Russel's (1995) stages of (1) awareness, (2) learning the process, (3) understanding the application of the process, (4) familiarity and confidence, (5) adaptation to other contexts, and (6) creative applications to new contexts. As the research scope covers companies that have implemented some level of DM, both "awareness" and "learning stages" were not included in the study. "Understanding the application of the process" is classified as low degree of adoption, "familiarity, and confidence" as moderate, and both "adaptation to other contexts", and "creative applications to new contexts" as high degree of adoption. In addition, four scale items were developed representing the Customer Responsiveness theme that comprises brand awareness, relationship building, and customer engagement. Two of the scale items 1. Faster responses to issues, needs, or complaints and 2. Faster, and easier-to-use options follow Wagner and Majchrzak (2006) postulation of customer engagement.

As an intensity of customer participation with both representatives of an organization and its customers in a collaborative knowledge exchange process. As Customer relationship management (CRM) is a critical component in DM of being responsive to the customer (P2P, 2022), a scale item "Staffs are knowledgeable and responsive to customer needs" was conceived. Finally, brand awareness is represented by "Clear, consistent brand messaging and information". The challenge theme is made up of four scale items with each representing the category of 1. Financial budget concern 2. Cyber security risk concern 3. Lack of technology infrastructure concern and 4. Lack of DM knowledge concern. Both Customer Responsiveness and Challenge variables are measured using a five-point psychometric Likert scale ranging from "1 = Strongly disagree", "2 = Disagree", "3 = Neutral", "4 = Agree" and "5 = Strongly agree". From the initial scales generated, the items were evaluated using SPSS v28 Exploratory Factor Analysis (EFA) for dimensionality reduction. Fit indices of Confirmatory Factor Analysis (CFA) were examined using SPSS AMOS structural equation modeling. The final scale was validated using Cronbach's Alpha (Hinkin, 1995) (Table 3). Based on the rule of thumb of an ideal ratio of ten participants for each scale item (Nunnally, 1978), the required sample size for the eight items is 80 respondents although the actual sample size used in the scale development was 125 respondents.

Table 3: Scale Development

Theme	In-Person Interview	Item development	EFA Factor 1	EFA Factor 2	Scale evaluation
DM adoption	How would you describe the impact of digital marketing on your company?	**Ordinal: Level of Adoption** Low: Understanding the application of the process Moderate: familiarity, and confidence High: Adaptation to other contexts, and creative applications to new contexts			Challenge Cronbach's Alpha: .812 Customer Resp. Cronbach's Alpha: .805 **Fit Values** p-value = .032
Challenges	Can you share some of the difficulties your company faced with embedding 4IR digital marketing into your marketing strategy?	**Factor 1: Challenges** C3. Cybersecurity is no longer a huge concern C2. Financial budget to support 4IR digital marketing is adequate C4. Tech. the infrastructure supporting 4IR digital marketing is sufficient	.837 .753 .785		Cmin/df = 1.726 GFI = .954 AGFI = .903 TLI = .944 CFI = .966 RMSEA = .069

		C1. Sufficient knowledgeable 4IR digital marketing employees	.619	
		Factor 2: Customer responsiveness		
Customer Resp.	What is the impact on performance after implemented DM? Has DM positively or negatively affected customer relationship?	R3. Clear, consistent brand messaging and information (Brand Awareness)		.821
		R1. Faster responses to issues, needs or complaints (Cust. Engagement)		.792
		R2. Products and services are responsive to customer needs (Relationship building)		.769
		R4. Faster, and easier-to-use service options (Cust. Engagement)		.765

Phase Two: Quantitative Analysis

Distribution Method and Data Collection: The actual study was carried out using a non-probability purposive sampling method drawn from a population of 318,888 SMEs that have implemented 4IR technology representing 26% of the SMEs registered under SME Corporation Malaysia (DOSM, 2021). Of the total 191 responses received, 38 were rejected as they did not meet the requirement of a company having some form of 4IR technology to support their marketing strategies giving a quantitative sample size of 153 respondents.

Analysis: Data for the actual run was analyzed using SPSS statistical software v28. Descriptive statistics were used to understand the demographics and characteristics of the respondents. Inferential statistical testing was carried out to determine the level of concern companies have for the challenges and correlation between DM adoption level and customer responsiveness. Screening and validity tests showed no multivariate and multicollinearity issues with the sample collected.

Descriptive Statistical Analysis: Demographic profile of the respondents (Table 4) shows that 84.3% were from the Information and communication, Manufacturing, Mining, Quarrying, and Services industry with the remaining 15.7% of the respondents from the Agriculture and Construction industry. There is a wide spread of 4IR technology used. Big data analytics (24.8%) is the most widely used application followed by cloud computing (16.3%), additive manufacturing (13.1%), system integration (11.1%), augmented reality (9.8%), internet of things (9.2%), and robotics (7.2%). Cross tabulation between the Industry Sector and Types of 4IR technology adopted shows Information and Communication technology industry uses mostly big data analytics, cloud computing, and system integration followed by the Manufacturing industry mostly on additive manufacturing, the internet of things, and robotics and finally the Service industry uses mostly simulation. In terms of employment position, the majority of the respondents are in management roles (83%) either as Managing Director/CEO, senior manager, or manager with the remaining 17% as owners or proprietors.

Table 4: Demographic Profiles

Item	Classification	Frequency	Percentage
Industry Sector	Agriculture	8	5.2
	Construction	16	10.5
	Information & Communication	33	21.6
	Manufacturing	40	26.1
	Mining & Quarrying	26	17.0
	Services	30	19.6
Type of 4IR Technology Adopted	Additive Manufacturing	20	13.1
	Augmented Reality	15	9.8
	Big Data Analytics	38	24.8
	Cloud Computing	25	16.3
	Horizontal & Vertical System Integration	17	11.1
	Internet of Things	14	9.2
	Robotics	11	7.2
	Simulation	13	8.5
Employment position	Owner/Proprietor	26	17.0
	Managing Director/CEO	41	26.8
	Senior Manager	41	26.8
	Manager	44	28.8
	Other	1	0.7

Inferential Statistical Analysis: In our quest to understand the clarifying question of whether companies have the same level of concern for all the challenges, the samples were first segregated into the three distinct stages of DM adoption. At each stage, a paired-samples T-test was carried out to compare and determine the significance of paired mean difference (Table 5). This approach was taken to eliminate possible variations between samples that could be caused by other factors. The outcome shows that within each stage of DM adoption, SMEs with low DM adoption are most concerned with Financial budget (B Mean= 2.74, SD=.900) and Technology infrastructure (I Mean = 2.82, SD =.927) indicated by the low mean value. In addition, the difference in mean value between Financial budget concern (B) and DM knowledge concern (K Mean = 3.26, SD = .686) (B/D paired difference t=4.269, sig. = .000) and between Financial budget concern and Cybersecurity risk concern (S Mean = 3.15, SD = .899) (B/S paired difference t=-2.890, .005) are statistically significant.

Moderate DM adoption SMEs are most concerned with Technology infrastructure (I Mean = 2.73, SD = .899) indicated by statistically significant low mean value when compared with the other three concerns (K t = 5.441, sig.= .000; B t = 2.164, sig. = 0.034; S t = 4.281, sig. = .000). This is followed by Financial budget concern (B Mean = 3.00, SD = 1.16), DM knowledge concern (K Mean = 3.43, SD = .810) and Cybersecurity risk (S Mean = 3.27, SD = .899). It is interesting to note that SMEs with high DM adoption have the highest mean value (K Mean = 3.56, SD = .112; B Mean = 3.70, SD = .869; S Mean = 3.48, SD = .108; I Mean = 3.63, SD = 1.08) for all identified concerns with no significant paired difference. The results imply that SMEs with high DM adoption understand the valued contributions of 4IR technology in augmenting their digital marketing strategy and driving their business to the next level of response to market needs.

Table 5: Paired Samples T-test

Paired samples test (Low-level DM adoption)

				K Paired Diff.		**B Paired Diff.**		**S Paired Diff.**	
	N	**Mean**	**SD**	**t**	**Sig.**	**t**	**Sig.**	t	Sig.
DM knowledge (K)	66	3.26	.686		Null				
Financial budget (B)	66	2.74	.900	4.269	.000		Null		
Cybersecurity (S)	66	3.15	.899	1.000	.321	-2.890	.005		Null
Infrastructure (I)	66	2.82	.927	4.536	.000	-.516	.608	2.900	.005

Paired samples test (Moderate level DM adoption)

				K Paired Diff.		S Paired Diff.		B Paired Diff.	
	N	Mean	SD	t	Sig.	t	Sig.	t	Sig.
DM knowledge (K)	60	3.43	.810		Null				
Cybersecurity (S)	60	3.27	.899	1.398	.167		Null		
Financial Budget (B)	60	3.00	1.16	2.943	.005	2.456	.017		Null
Infrastructure (I)	60	2.73	.899	5.441	.000	4.281	.000	2.164	.034

Paired samples test (High-level DM adoption)

				K Paired Diff.		B Paired Diff.		S Paired Diff.	
	N	Mean	SD	t	Sig.	t	Sig.	t	Sig.
DM knowledge (K)	27	3.56	1.12		Null				
Financial Budget (B)	27	3.70	.869	-.779	.443		Null		
Cybersecurity (S)	27	3.48	1.08	.263	.795	1.442	.161		Null
Infrastructure (I)	27	3.63	1.08	-.254	.802	.402	.691	-1.28	.212

In our attempt to answer whether the level of concern for these challenges varies across different stages of DM adoption, the Kruskal-Wallis H test, a rank-based nonparametric without an assumption of homogeneity of variances (Laerd Statistics, 2022) was used to eliminate the possibility of Type-1 error due to the nonparametric structure of DM adoption groups (Low DM adoption (N=66), Moderate DM adoption (N=60), High DM adoption (N=27)). The outcome shows that there is no significant paired difference for DM knowledge concern (K Kruskal-Wallis sig. = .221) and Cybersecurity risk (S Kruskal-Wallis sig. = .186) across the different levels of DM adoption (Table 6). However, it is interesting to note a reducing concern on Financial budget concern (L Mean = 2.74, SD = 0.90, M Mean = 3.27, SD = 0.90, and H Mean = 3.70, SD = 0.87) as it progressed from low to high DM adoption. This finding is supported by a statistically significant adjusted paired difference particularly between those at low and higher DM adoption stages (L/M adj. sig. = 0.012, L/H adj. sig. = 0.000). The other interesting finding is that whilst both low and moderate DM adoption SMEs are concerned with Technology infrastructure (L Mean = 2.82, SD = 0.93, M Mean = 2.73, SD = 1.02), SMEs with high DM adoption have lesser such concern (H Mean = 3.63, SD = 1.08). The finding is supported by the significant adjusted paired difference between low and high (L/H adj. sig. = 0.003), and that between moderate and high DM adoption (M/H adj. sig. = 0.001).

Table 6: Challenges

		DM knowledge (K)				Financial budget (B)			
		Pair-wise comparison sig. (adj. sig.)				Pair-wise comparison sig. (adj. sig.)			
N	Adoption	Low	Mod.	Mean	SD	Low	Mod.	Mean	SD
66	Low (L)	Null		3.26	0.69	Null		2.74	0.90
60	Mod. (M)	Null	Null	3.43	0.81	.004 (.012)	Null	3.00	1.16
27	High (H)	Null	Null	3.56	1.12	.000 (.000)	.050 (.151)	3.70	0.87
	Kruskal-Wallis sig. = .221					Kruskal-Wallis sig. = .000			

		Cybersecurity (S)				Infrastructure (I)			
		Pair-wise comparison sig. (adj. sig.)				Pair-wise comparison sig. (adj. sig.)			
N	Adoption	Low	Mod.	Mean	SD	Low	Mod.	Mean	SD
66	Low (L)	Null		3.15	0.90	Null		2.82	0.93
60	Mod. (M)	Null	Null	3.27	0.90	.578 (1.00)	Null	2.73	1.02
27	High (H)	Null	Null	3.48	1.09	.001 (.003)	.000 (.001)	3.63	1.08
	Kruskal-Wallis sig. = .186					Kruskal-Wallis sig. = .001			

The final clarifying question is to determine the correlation between the variables of DM adoption level and customer responsiveness. Due to the ordinal and non-parametric structure of the DM adoption level, a combination of the Kruskal-Wallis H test and Spearman rank-order correlation was used to determine the strength and direction of association (Laerd, 2022) between DM adoption level and customer responsiveness. The outcome reveals a weak but significant direct correlation (coef. = .228**) between the variables (Table 7). This result is supported by a pair-wise comparison showing a significant adjusted paired difference (adj. sig. = .007) in customer responsiveness between low and high DM adoption.

Table 7: Customer Responsiveness

	Pair-wise comparison sig.				Correlations (Spearman's Rho)		
	sig. (adj. sig.)					DM adoption level	Cust. Resp.
	Low	Mod.	Mean	SD			
Low (L)			3.70	0.8	DM adoption level	1	
Mod. (M)	.254 (.763)		3.91	0.6	Cust. Resp.	.228**	1
High (H)	.002 (.007)	.034 (.101)	4.22	0.6			
Kruskal-Wallis sig. = .01					** Significant at 0.01 level (2-tailed).		

Phase Three: Interpretation: The final stage of exploratory sequential mixed method study involves integrating and interpreting the outcomes connecting both qualitative and quantitative strands of data (Table 8).

Table 8: Interpretation

Research objective	Qualitative findings	Quantitative findings	Interpretation
QLRO1: challenges faced by SMEs in embracing DM technologies. QTRO1: Examine the level of concern about the challenges within each stage and across different stages of DM adoption.	• Lack of financial budget • Inadequate technology infrastructure • Lack of DM knowledge • Cybersecurity risk	**Within each stage of DM adoption** • SMEs with low DM adoption were most concerned with financial budget and technology infrastructure. • SMEs with moderate DM adoption were most concerned with technology infrastructure. **Across different stages of DM adoption** • SMEs with high DM adoption have the least concern with all four challenges. • DM knowledge and cybersecurity were the least concerns for all stages of DM adoption.	• When comparing the four concerns within each stage of DM adoption, technology infrastructure and financial budget were the most critical concerns followed by lack of DM knowledge and cybersecurity risk for SMEs with low and moderate DM adoption. However, no such observation was made for SMEs with high DM adoption that has no significant differences among the four concerns. • When comparing across different stages of DM adoption, financial budget concern was more pronounced in low and moderate DM adoption than those with high DM adoption. Similar observation was made for technology infrastructure that was perceived as more concerning for SMEs with low and moderate DM adoption stages. • Although DM knowledge and cybersecurity are still concerns, their mean values across all stages of DM adoption show relatively less critical when compared with the others.
QLRO2: Investigate the impact of DM adoption in SMEs. QLRO3: Usefulness of DM in providing holistic customer responsiveness. QTRO2: Determine the linkage between different stages of DM adoption and customer responsiveness	• Great tool for product and service innovation and an effective marketing and sales tool • Relationship building, engaging with customers, and creating brand awareness. • May not translate into sales as buying decision process depends on other critical factors such as price and quality	• Outcome reveals a weak but significant direct correlation between DM adoption level and customer responsiveness. • Customer responsiveness mean value increases progressively from low to high DM adoption. • Significant difference in customer responsiveness between low and high DM adoption.	• Outcome of quantitative test supports qualitative findings of correlation between DM adoption and customer responsiveness. Finding also shows that companies with high DM adoption have the highest customer responsiveness and the least concern with the identified challenges. The weak but significant link between the two variables supports the qualitative finding that although DM promotes customer responsiveness (significant**), it alone would not generate demand without considering other contributing factors (coeff. = .288).

Findings: The findings from Phase 3 interpretation reveal the reasons for SME slow adoption of DM attributed to the lack of financial budget and technology infrastructure especially for SMEs with low and moderate stages of DM adoption. These SMEs are running on a shoe-strung budget. The high cost of 4IR transformation coupled with the COVID-19 pandemic has caused many SMEs that have not fully adopted 4IR DM to scale back from a further capital investment into the advanced technology. With the economy yet to return to its pre-pandemic level (Lee, 2022) there is hardly enough motivation for SMEs to undertake high-risk investments with no certainty of a positive return. The ramification of such a decision is a delay in implementing the desired technology infrastructure to support 4IR which then underpins the low need for DM knowledge and Cybersecurity. On the contrary SMEs with high DM adoption do not have significant issues with these concerns. Due to their adaptation ability and creative use of various applications in the context of DM, they were able to capitalize on this competitive advantage in building resiliency and responsiveness (mean = 4.22, SD = 0.6) to customer needs.

It is supported by the positive and significant correlation (coeff. = .288**) between DM adoption and customer responsiveness. For many of these high DM adoption SMEs, the explosion of digital culture during the COVID-19 pandemic due to lockdowns imposed by governments helps increase online sales that contain reductions in revenue from normal distribution channels. The final revelation is that although DM improves customer engagement, relationship building and brand awareness, this is only possible when applying the right strategy that is supplemented by 4IR as a technology enabler. This assertion supported by a weak but significant link (coeff. = .288**) between DM adoption and customer responsiveness indicates that DM driven solely by 4IR would not bring the desired effect as there are other consideration factors such as price and quality. In addition, having 4IR allows firms to incorporate new digital marketing strategies such as the 4C's of Co-creation, Currency, Communal Activation, and Conversation which involves customers from the early ideation stage (Co-creation) to customer engagement (Conversation) during commercialization. In essence to have a profound effect, a combination of strategies including the use of 4IR must be put in place for firms to establish competitive advantages and bring better customer experiences with long-term sustainability.

5. Discussion and Interpretation of Results

This study was undertaken to explore the three qualitative objectives:
QLRO1: Explore challenges faced by SMEs in embracing DM
QLRO2: Investigate the impact of DM adoption in SMEs
QLRO3: Probe the usefulness of DM in providing holistic customer responsiveness.
And the two quantitative research objectives:
QTRO1: Examine the level of concern about the challenges within each stage and across different stages of DM adoption
QTRO2: Determine the linkage between different stages of DM adoption and customer responsiveness
In response to the QLRO1 and QTRO1, this study reveals that whilst SMEs are willing to invest in basic technology infrastructure and use limited 4IR digital capability to drive their marketing strategies, they are not willing to spend big to capitalize on the advent of the revolutionary 4IR technology citing lack of financial budget, inadequate technology infrastructure to support such setup, cyber security risk, and lack of DM knowledge as the main reasons. This is understandable given the rapid development of technology requiring regular scale-up of technology infrastructure and capabilities of its workers and the COVID-19 pandemic-related issues. Small businesses are also finding it difficult to retain capabilities and offer competitive compensation for such skills. These reactions are supported by reports stating that SMEs are afraid to adopt 4IR as they have a mindset that it would put additional strain on their financial situation (MITI, 2019).

Although the quantitative study triangulated and validated these concerns, it seems that DM knowledge concern and cyber security risk are not considered the most critical due to the effect of financial budget constraints. There are also other alternatives such as outsourcing that would allow SMEs to tap into experienced digital marketing agencies and the latest marketing tools. As outsourced marketing agencies are operating independently outside SMEs' internal domain, such arrangements would safeguard affected SMEs from cybersecurity vulnerabilities and threats. Studies such as Edvardsson, Durst, & Oskarsson, 2020 suggest that SMEs with an outsourcing strategy tend to perform better. However, this solution requires two major considerations. First, digital marketing utilizing 4IR technology whether internally or otherwise requires

substantial funding. SMEs with their limited financial budgets are struggling to keep their operation running much less devoting more financial resources to fund the transformation. Secondly, there is still the market demand consideration that requires an adequate response by way of understanding market trends and producing market-driven innovations. Although certain aspects of marketing strategies can be done externally, such an option is not available for an enterprise to maintain its cutting-edge technology that is either done internally or risk losing confidentiality and market competitiveness.

The need for advanced technological infrastructure set up to support in-house research and development has resulted in a costly digital shift in terms of time and resources (Chavez et al., 2022). In response to the second qualitative objective (QLRO2), these research findings have shown that SMEs with low and moderate DM adoption consider full-scale adoption of 4IR technology as risky, and superfluous in the context of small business marketing strategy. For the majority of these enterprises, they made do with limited 4IR technology capabilities to support their online marketing campaign. However, such an approach is hardly effective in generating a high volume of quality sales leads and establishing an interactive symbiotic relationship with customers that brings value to service improvement, increases product quality, and contributes towards product innovations. As a result, they run the risk of not catching up with corporations that spend heavily on state-of-the-art technology as part of an integral element to create highly effective marketing strategies turning data into above-market growth, driving market-driven products, and improving marketing rate of return. The world is changing and changing rapidly. Younger generations are increasingly using smart devices for interactions and communication.

Gone were the days of traditional marketing when advertising and promotions were carried out offline, and in their place are interactive social networking sites, emails, and mobile apps that are used as the preferred mode of communication. The accelerating pace of technological change is transforming the state of sociocultural forces in customer attitude, behavior, and lifestyle in what is known as the “new norm”. Social distancing introduced by the government to curb the spread of the Covid-19 virus has resulted in the manifestation of remote-based arrangements such as work-from-home policy and online education. These arrangements have invariably increased online shopping and e-commerce transactions. However, it is worth noting that SMEs with high DM adoption are reaping the benefits of their investment. The quantitative findings indicate that the identified concerns are relatively less pronounced than their counterparts. By seeing this growing digitalization trend as an opportunity to recast themselves by going digital aggressively, they offer a new set of options to reconnect, entice and develop meaningful relationships with their customers. Perhaps, instead of looking inwards at their challenges, SMEs should strive for a more forward-looking setup collaborating with external parties that could help overcome their conundrum. Options such as collaboration, outsourcing, and right sourcing can be utilized in which parts of digital marketing strategy can be contracted to subject matter experts providing such services. Taking this route alleviates an organization's limitations whilst achieving greater resiliency, better risk, and resource management.

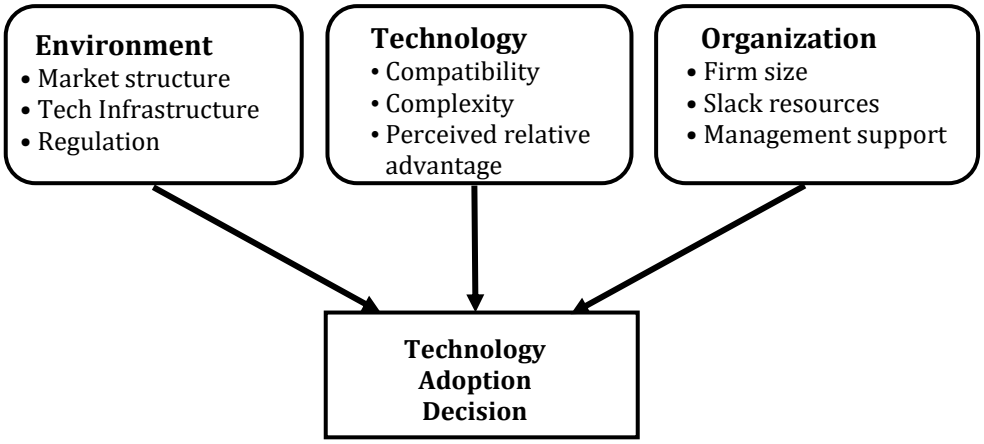
Furthermore, having experts who know how to unlock the power of 4IR functionalities for the fulfillment of 4C’s brand-to-customer marketing model would ultimately benefit customers and increase the effectiveness of their marketing strategies. Studies such as Mannix (2018) have posited that with a fit-for-purpose deployment, it is reasonable to assume benefits derived from using emerging technology outweigh the cost of deployment. The final qualitative and quantitative objectives (QLRO3 and QTRO2) are to determine the stages of SME’s DM adoption and their effect on customer responsiveness. Although there is no denying the positive outcome, it must not be construed that adopting 4IR technology would automatically lead to customer conversion. This is because advanced technology is merely a tool providing companies the means to make a difference in the way marketing strategy is carried out. Using it as an enabler of strategic change would speed up the decision-making process leading to faster go-to-market deployment, better product innovations, and more intimate customer management. Unless a comprehensive and properly structured approach is put in place by incorporating these advanced technological tools in an enterprise marketing strategy to produce innovative market-driven products, having a DM tool for a basic marketing campaign would not elevate customer responsiveness. It is therefore essential for SMEs adopting DM to link their cyber-physical system to revolutionary marketing strategies such as 4C’s brand-to-customer marketing model that harnesses the superiority of the technology. For example, at the Co-creation stage, consumers could be involved in co-producing prototypes at various value-creating stages using 4IR technology such as simulation

and Virtual Reality (VR).

This concept of co-production increases creativity and idealization, reduces obstacles, and improves the model scale of prototypes (Freeman et al., 2018) which allows a business to customize and personalize product features according to its target market community needs. In the Currency component, companies can benefit from the information provided by data collected from their target market. Big data intelligence allows businesses to do optimal pricing for customers that can be set dynamically according to their spending, historical purchase pattern, and proximity of prospects' location to the store. Companies such as PURE saw their online sales increase by 13.52% within three months following the implementation of a predictive machine-learning algorithm that offers discretionary discounts to exiting non-buying customers (Iris pricing solution, 2020). 4IR additive manufacturing and IOT technology can be utilized in Communal activation for peer-to-peer distribution of goods and services. Examples such as enhancing Google Maps and Waze using 3D technologies to facilitate accurate location guides in navigating complex environments such as metropolitan or a store inside a mall. The final Conversation component leverages the proliferation of social media that enables product reviews, feedback, and evaluations by consumers through establishing interactive consumer-to-consumer, and business-to-consumer communication. Having an end-to-end two-way mode of communication serves as a collaborative customer care tool for enterprises to show genuine concern for customers by listening, responding, and following through on terms dictated by both companies and their customers.

Corporation: Where resources are abundant and the information technology budget is huge in absolute term albeit low in relation to revenue, SMEs cannot afford such luxury due to financial constraint that presents a higher risk and greater impact should the venture not turn out in their favor. It is not surprising that the majority of these enterprises opt for a phase adoption strategy. Whilst this approach is more risk-averse, it leads to slow digital transformation (Aqilah, 2021). This phenomenon can be explained via the Technology-Organization-Environment (TOE) framework (Figure 6) which stipulates that the adoption of new technology is influenced by the three elements of Technology, Organization and Environment and that these elements exert both constraints and opportunities for technological innovation (DePietro, Wiarda, & Fleischer, 1990). Whilst SME management recognizes the superiority of advanced technology in driving competitive advantage (Technology), the combination of financial constraints (Organization) and venture risks arising from the setting up of technology infrastructure (Environment) have led to an unwillingness for a full-scale digital transformation (Technology Adoption Decision).

Figure 6: Technology-Organization-Environment (TOE) framework



Practical Implication: With the government push for digital connectivity, SMEs do not have a choice but to respond adequately to stay relevant in the industry. The Malaysian government in recognition of the financial constraint has started initiatives such as Syarikat Jaminan Pembiayaan Perniagaan Bhd (SJPP) that guarantees up to 70 percent of bank loans extended to SMEs. The government aspires that having a credible guarantor could reduce the borrowing spread rate by 3.5 percent (NSTP, 2019). The Industry4WRD Intervention Fund has provided SMEs with a matching grant of up to RM500,000 with 30 percent upfront

given by the Government to kick start their 4IR migration plan. Furthermore, SMEs can apply for other incentives such as Domestic Investment Strategic Fund and High Impact Fund (MITI, 2021). These are good moves as lowering borrowing costs would bring relief to small businesses intending to take advantage of revolutionary technologies to power their DM campaign. However, it still does not resolve the pain point of building capabilities and mitigating the brain drain that is necessary to sustain innovations in SMEs.

One way out of this conundrum for the government to set up a Digital Center of Excellence (DCOE) not for the sole purpose of startup financing but with a shared area of focus and subject matter expertise that allows SMEs to gain access to a variety of skill sets including data scientists, and algorithm architects that could help small businesses to reengineer processes, build advanced algorithms and integrate workflow to support decision making. Although the Ministry of International Trade and Industry has taken the lead in rolling out a Readiness Assessment Framework to assess the readiness of SMEs to undertake 4IR transformation efforts, it is not enough. There should also be a cultural mindset shift in SMEs to take on the challenge of embracing the future way of doing business. Through the DCOEs, the Government can do more by providing SMEs with the experience of what 4IR can do for their businesses. This relationship of public-private partnership under the concept of Malaysia Incorporated (NST Business, 2019) could pave the way and build the success of the SME industry hastening the Government transformation agenda of National Policy on 4IR.

Suggestion for Future Research: This two-year study was carried out at the onset of the Covid-19 pandemic crisis that upended the global social economy, changing social norms, and transitioning normative practices into a new way of production, and consumption. SMEs unfortunately were drawn into the center of these disruptions placing them in a precarious position due to a sudden drop in demand and production. In many countries, SMEs ended up depending on government emergency liquidity aid for survival. As a result, these enterprises do not have a choice but to change their business model. It would be interesting to understand how these changes are affecting the use of 4IR technology as a digital marketing strategy tool in the new norm. Having this knowledge would facilitate an understanding of SMEs' metacognitive ability in responding to emerging threats by self-assessing and self-correcting to ensure their survival.

Conclusion

In this economic climate, it is critical for SMEs to keep themselves continuously appraised with the rapid change in technology and socio-economic development to stay relevant in the industry. Companies are increasingly reliant on advanced technology to power their business, drive efficiency, and productivity to deliver quality products, and services to an ever-increasing demanding market. With the recovery of the economy, this is a make-or-break time for SMEs to take a giant leap forward in digital marketing transformation.

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