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TABLE of CONTENTS

MAPPING THE INTELLECTUAL LANDSCAPE OF TEAM PERFORMANCE RESEARCH IN EMERGENCY AND LAW ENFORCEMENT CONTEXTS: A BIBLIOMETRIC ANALYSIS (2000-2025) Norsyazwani Ab Halim ^{1*} , Azlyn Ahmad Zawawi ² & Nur Zafifa Kamarunzaman ³	1 - 25
ARTIFICIAL INTELLIGENCE IN HIGHER EDUCATION MATHEMATICS: A SYSTEMATIC REVIEW OF AI-BASED PLATFORMS, CHALLENGES, AND TEACHING TRANSFORMATION Yee Ming Chew ¹ , Set Foong Ng ² & Kok Shien Ng ^{3*}	26 - 38
ASSESSING THE RELATIONSHIP BETWEEN COERCIVE FACTORS AND E-SERVICE CONTENT ON MALAYSIAN LOCAL GOVERNMENT WEBSITES Sabariah Abd Samad ¹ , Corina Joseph ^{2*} & Leong Siow Hoo ³	39 - 53
DISCLOSURE OF CORPORATE RISK INFORMATION: EVIDENCE FROM AWARD-WINNING ORGANIZATIONS IN MALAYSIA Nur Syahira Rashadan ¹ , Corina Joseph ² , Muhammad Hariz Hamid ^{3*} , Sharifah Norzehan Syed Yusuf ⁴	54 - 78
METACOGNITIVE LISTENING STRATEGIES AND LANGUAGE PROFICIENCY AMONG MALAYSIAN ESL PRE-UNIVERSITY STUDENTS Suzie Wong@Rahman ^{1*} , Mohammad Radzi Manap ² , Nor Fazlin Mohd Ramli ² & Zachariah Aidin Druckman ²	79 - 100
ELEMEN KETIDAKSANTUNAN DALAM RUANGAN KOMEN MEDIA SOSIAL BERKAITAN LANTIKAN HAKIM MAHKAMAH PERSEKUTUAN Mohamad Nik Mat Pelet ^{1*} , Adib Zakwan Alqayyum Shahbuddin ¹ , Nurul Nadia Samud ¹ , Norita Harijaman ¹ , Nor Hani Suhaimi ¹	101 - 114
REINTERPRETING MALAY TRADITION: HYBRID AESTHETIC FRAMEWORKS IN CONTEMPORARY VISUAL ART PRACTICES Mohamat Najib bin Mat Noor ^{1*}	115 - 126
DETERMINANTS OF CUSTOMER SATISFACTION TOWARDS ROBOTIC WAITERS AMONG GEN Z CUSTOMERS IN MALAYSIA: A CONCEPTUAL PAPER Law Kuan Kheng [*]	127 - 135
PERCEPTION AND ADOPTION INTENTION OF ONLINE MARKETING AND SEARCH ENGINE OPTIMIZATION (SEO) AMONG SME ENTREPRENEURS IN ANJUNG KINABALU: AN APPLICATION OF THE THEORY OF PLANNED BEHAVIOR Joshua Alfred ¹ , Viduriati Binti Sumin ^{1*}	136 - 153
THE ROLES OF LOCAL COMMUNITY IN SUSTAINABLE MARINE RESOURCES MANAGEMENT: A CASE STUDY OF TUN MUSTAPHA PARK, SABAH Erica Joanne Reuben ^{1*} , Haijon Gunggut ² , Haidy Henry Dusim ³	154 - 170
BEYOND TECHNICAL COMPETENCE: ALIGNING OBE AND VBE FOR FUTURE-READY ENGINEERING TECHNOLOGY EDUCATION Chee-Ming Chan ^{1*} , Azeanita Suratkon ² & Alina Shamsuddin ³	171 - 185
PLASTIC CONSUMPTION IN THE DIGITAL ERA: A BIBLIOMETRIC ANALYSIS BASED ON AUTHOR AND INDEX KEYWORDS Che Faridah Che Mahmood ¹ , Nor Zubaidah Nor Albashri ^{2*} , Mazlina Ismail ³ , Nur Adilah Saud ⁴ , Suhaili Mohd Yusof ⁵ & Yan-Ling Tan ⁶	186 - 203

ALGORITHM DESIGN PATTERNS: A CONCEPTUAL FRAMEWORK FOR SIMPLIFYING COMPLEX PROBLEMS IN BEGINNER COMPUTER SCIENCE EDUCATION Nureen Qistina Affandi ¹ , Siti Nur Ain Abd Rahman ²	204 - 218
A CRITICAL REASSESSMENT OF INTELLECTUAL CAPITAL MANAGEMENT IN THE AGE OF ALGORITHMIC MANAGEMENT Kardina Kamaruddin ¹ , Noor Malinjasari Ali ²	219 - 238
GENERATIVE AI AS A LEARNING COMPANION: OPPORTUNITIES AND CHALLENGES FOR NOVICE PROGRAMMERS Noor Hasnita Abdul Talib ¹ , Jasmin Ilyani Ahmad ² , Zanariah Idrus ³ , Nor Hafizah Abdul Razak ⁴ , Siti Nurbaya Ismail ⁵ & Intan Radina Ahmad ⁶	239 - 251
DIGITAL AMNESIA IN THE DIGITAL CLASSROOM: A REVIEW OF MEMORY RETENTION CHALLENGES AMONG COMPUTER SCIENCE STUDENTS Jasmin Ilyani Ahmad ¹ , Noor Hasnita Abdul Talib ² , Intan Radina Ahmad ³ , Siti Nurbaya Ismail ⁴ , Nor Hafizah Abdul Razak ⁵ & Zanariah Idrus ⁶	252 - 269

Perception and Adoption Intention of Online Marketing and Search Engine Optimization (SEO) among SME Entrepreneurs in Anjung Kinabalu: An Application of the Theory of Planned Behavior

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ARTICLE INFO	ABSTRACT
<i>Article history:</i> Received Mac 2026 Accepted June 2026 Published July 2026	The rapid advancement of digital technologies has transformed business operations, making online marketing and Search Engine Optimization (SEO) essential for enhancing business visibility and competitiveness. Despite these benefits, the adoption of online marketing and SEO among Small and Medium Enterprises (SMEs) in Sabah remains limited. This study aims to examine SMEs' awareness of online marketing and SEO and investigate the influence of attitude, subjective norms, and Perceived Behavioral Control (PBC) on their intention to adopt these digital marketing strategies based on the Theory of Planned Behavior (TPB). A quantitative cross-sectional survey was conducted among 100 SME entrepreneurs operating in Anjung Kinabalu, Kota Kinabalu, Sabah, using purposive sampling. Data were collected through structured questionnaires and analyzed using descriptive statistics and Multiple Linear Regression (MLR). The findings indicate that SME entrepreneurs generally possess moderate to high awareness of online marketing, although knowledge of SEO remains limited. Regression analysis revealed that attitude, subjective norms, and PBC significantly and positively influence SMEs' intention to adopt online marketing and SEO, with PBC emerging as the strongest predictor. The model explained 93.1% of the variance in behavioral intention ($R^2 = 0.931$). The findings support the applicability of the TPB in explaining digital marketing adoption among SMEs. This study contributes to the literature on SME digital transformation in Sabah. It provides policymakers and SME support agencies with practical insights for designing targeted digital capacity-building programs to enhance online marketing and SEO adoption
<i>Keywords:</i> Online marketing Search Engine Optimization Small Medium Enterprise (SMEs) Theory of Planned Behavior Digital Marketing	
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INTRODUCTION

The rapid advancement of digital technology has transformed the global business environment and fundamentally changed how businesses interact with consumers. The widespread adoption of the internet, smartphones, social media platforms, and digital applications has created new opportunities for businesses to expand market reach, strengthen customer engagement, and improve operational efficiency. Consequently, online marketing has become an essential business strategy for maintaining competitiveness

in an increasingly digital economy. Online marketing encompasses a range of internet-based promotional activities, including social media marketing, content marketing, email marketing, influencer marketing, and SEO. Among these, SEO has emerged as one of the most effective strategies for improving online visibility, increasing organic website traffic, and enhancing brand credibility through higher search engine rankings (Nordin et al., 2023). As consumers increasingly rely on digital platforms for information and purchasing decisions, businesses that fail to establish a strong online presence risk losing competitiveness and market opportunities.

SMEs play a vital role in economic development by generating employment, fostering innovation, and contributing significantly to national income. In Malaysia, SMEs account for approximately 98.5% of all business establishments and remain a major contributor to the country's Gross Domestic Product (GDP) (SME Corp Malaysia, 2023). Despite their economic importance and the recognized benefits of digital marketing, many SMEs continue to demonstrate low levels of online marketing and SEO adoption. Previous studies have identified barriers such as limited digital literacy, inadequate technological capabilities, financial constraints, and insufficient knowledge of digital marketing strategies (Zulu-Chisanga et al., 2021; Hoo et al., 2023). These challenges are particularly evident among SMEs operating in developing regions and rural communities.

In Sabah, SMEs represent a significant component of the local economy, particularly in traditional product manufacturing, handicrafts, food processing, and tourism-related businesses. The COVID-19 pandemic accelerated digital transformation by compelling many SMEs to adopt online platforms to sustain business operations during movement restrictions (Mohd Noor et al., 2021). However, despite increased awareness of digital marketing, infrastructural limitations, resource constraints, and varying levels of digital competency continue to hinder the effective adoption of online marketing and SEO among local entrepreneurs. This highlights a persistent gap between recognizing the importance of digital marketing and possessing the capability to implement it effectively.

The TPB, developed by Ajzen (1991), provides a well-established framework for explaining behavioral intention towards technology adoption. The theory proposes that behavioral intention is influenced by three key constructs: attitude, subjective norms, and PBC. TPB has been widely applied to explain technology adoption across various contexts, including entrepreneurship, digital innovation, and environmental behavior. Nevertheless, empirical evidence on the application of TPB to explain online marketing and SEO adoption among SMEs in Sabah, particularly those operating in Anjung Kinabalu, remains limited.

Therefore, this study aims to examine SMEs' awareness and perceptions of online marketing and SEO and investigate the influence of attitude, subjective norms, and PBC on their intention to adopt these digital marketing strategies. The findings are expected to contribute to the growing literature on SME digital transformation while providing practical insights for policymakers, government agencies, and business support organizations in designing effective digital capacity-building initiatives that enhance online marketing and SEO adoption among SMEs.

2. LITERATURE REVIEW

2.1 Theory of Planned Behavior (TPB)

The TPB, developed by Ajzen (1991), is one of the most widely applied theoretical frameworks for explaining human behavior and behavioral intention across various contexts, including technology adoption, entrepreneurship, environmental sustainability, and digital transformation. The theory posits that behavioral intention serves as the immediate antecedent of behavior and is influenced by three primary determinants: attitude, subjective norms, and PBC. TPB extends the earlier Theory of Reasoned Action (TRA) by incorporating PBC, which recognizes that individuals may encounter constraints that affect their ability to perform a behavior. This addition has enhanced the theory's predictive capability, particularly in contexts where resource availability, skills, and external barriers play significant roles. In recent years, TPB has been extensively applied in studies investigating technology adoption among SMEs. The theory has demonstrated strong explanatory power in understanding entrepreneurs' intentions to adopt digital innovations, e-commerce platforms, social media marketing, and other technology-driven business practices. Previous research has consistently shown that positive attitudes, favourable social influences, and greater perceived control contribute significantly to adoption intentions. Given the growing importance of digital marketing technologies, TPB provides an appropriate

framework for examining SMEs' behavioral intentions toward online marketing and SEO adoption. By focusing on psychological and social determinants, the theory enables researchers to understand why certain entrepreneurs embrace digital marketing strategies while others remain hesitant despite similar external conditions.

2.2 Attitude Towards Online Marketing and SEO Adoption

Attitude refers to an individual's overall evaluation of a particular behavior as favorable or unfavorable. According to Ajzen and Fishbein (2000), attitudes are formed through beliefs regarding the anticipated outcomes of a behavior and the value attached to those outcomes. In the context of online marketing and SEO, attitude reflects SME entrepreneurs' perceptions of the potential benefits associated with adopting digital marketing technologies. Entrepreneurs who believe that online marketing can improve customer reach, increase sales performance, strengthen brand awareness, and enhance competitiveness are more likely to develop positive attitudes toward adoption. Several studies have reported a significant positive relationship between attitude and technology adoption intentions. Nordin et al. (2023) identified that Malaysian SMEs with favorable attitudes toward digital marketing demonstrated stronger intentions to implement online marketing strategies. Similarly, Hoo et al. (2023) reported that SME owners who perceived digital marketing as a strategic business tool exhibited higher levels of digital engagement and innovation adoption. The positive influence of attitude can be attributed to the perceived usefulness and strategic value associated with digital technologies. When entrepreneurs believe that digital marketing contributes directly to business performance, they are more willing to invest time, resources, and effort in adopting these practices.

2.3 Subjective Norms and Digital Marketing Adoption

Subjective norms refer to perceived social pressure from important individuals or groups that influence an individual's decision-making process. According to TPB, subjective norms originate from normative beliefs regarding whether significant others approve or disapprove of a specific behavior. For SME entrepreneurs, subjective norms may arise from various stakeholders, including family members, customers, suppliers, business partners, government agencies, industry associations, and fellow entrepreneurs. These social influences can shape entrepreneurs' perceptions regarding the importance and desirability of adopting online marketing and SEO. Previous studies have demonstrated that social influence plays a crucial role in technology adoption decisions. Razali et al. (2020) highlighted that subjective norms significantly affected behavioral intentions in environmental and technology-related contexts. Similarly, Bosnjak et al. (2020) reported that individuals are more likely to engage in a behavior when influential people in their social networks support it. In the SME environment, recommendations from successful entrepreneurs, digital marketing consultants, and government support agencies often encourage businesses to adopt new technologies. Therefore, subjective norms are expected to positively influence SMEs' intention to adopt online marketing and SEO strategies.

2.4 Perceived Behavioral Control

PBC refers to an individual's perception of their capability, resources, and opportunities to perform a specific behavior successfully. Within TPB, PBC reflects both self-efficacy and controllability aspects that determine whether an individual feels capable of performing the intended action.

In the context of digital marketing adoption, PBC encompasses entrepreneurs' confidence in their ability to utilize online marketing platforms, manage digital content, understand SEO practices, and overcome technological challenges. It also reflects access to resources such as internet connectivity, technical support, financial capital, and digital training opportunities.

Numerous studies have identified PBC as one of the strongest predictors of technology adoption intentions. Bruce et al. (2023) reported that SMEs possessing higher digital competence and technological confidence demonstrated stronger intentions to adopt digital marketing tools. Likewise, Matosas-López (2024) found that perceived capability significantly influenced businesses' willingness to implement advanced digital marketing strategies.

The importance of PBC is particularly relevant among SMEs operating in developing regions, where limitations in infrastructure, resources, and technical expertise may constrain technology adoption. Entrepreneurs who perceive fewer barriers and greater control over implementation are more likely to engage in online marketing and SEO activities.

2.5 Online Marketing and Search Engine Optimization (SEO)

Online marketing has become an essential component of contemporary business strategy due to increasing internet penetration and digital consumer behavior. It involves the use of internet-based platforms to promote products and services, engage customers, and generate sales. SEO represents a specialized component of online marketing that focuses on improving a website's visibility in search engine results. SEO aims to increase organic traffic by optimizing website content, structure, and technical performance according to search engine algorithms.

The adoption of online marketing and SEO offers several benefits to SMEs. These include enhanced visibility, increased customer engagement, cost-effective promotion, broader market reach, and improved competitiveness. Compared to traditional advertising methods, digital marketing provides greater flexibility, measurable outcomes, and targeted communication.

Despite these advantages, many SMEs continue to experience difficulties in implementing effective online marketing strategies. Common challenges include limited digital literacy, inadequate financial resources, insufficient technical knowledge, and lack of strategic planning. These barriers are particularly prevalent among micro and small enterprises operating in traditional business sectors.

In Malaysia, government initiatives such as the Malaysia Digital Economy Blueprint (MyDIGITAL), SME Digitalisation Grant, and various digital transformation programmes have been introduced to encourage digital adoption among SMEs. Nevertheless, adoption rates remain uneven, particularly among businesses located outside major urban centres.

2.6 Conceptual Framework and Hypotheses Development

The TPB, developed by Ajzen (1991), proposes that an individual's behavioral intention is determined by three key constructs: attitude, subjective norms, and PBC. These constructs have been widely applied in studies examining technology adoption, entrepreneurial behavior, and digital transformation among SMEs.

In the context of online marketing and SEO, SMEs' intention to adopt digital marketing strategies may be influenced by their perception of the benefits of digital marketing, the influence of important stakeholders, and their confidence in possessing the necessary resources and capabilities to implement such strategies successfully.

Attitude reflects an entrepreneur's favorable or unfavourable evaluation of adopting online marketing and SEO. When SME entrepreneurs perceive digital marketing as useful and capable of improving business performance, they are more likely to develop positive intentions toward adoption.

Subjective norms refer to the perceived social pressure from significant others, such as customers, family members, fellow entrepreneurs, suppliers, government agencies, and business networks. The greater the encouragement and support received from these stakeholders, the higher the likelihood that SMEs will adopt online marketing and SEO practices.

PBC refers to entrepreneurs' perceptions of their ability to implement online marketing and SEO effectively. This includes confidence in their digital skills, access to technology, financial resources, internet infrastructure, and technical support. SMEs with higher levels of PBC are expected to demonstrate stronger intentions to adopt digital marketing technologies.

Based on the TPB and previous empirical studies, this study proposes that attitude, subjective norms, and PBC positively influence SMEs' intention to adopt online marketing and SEO.

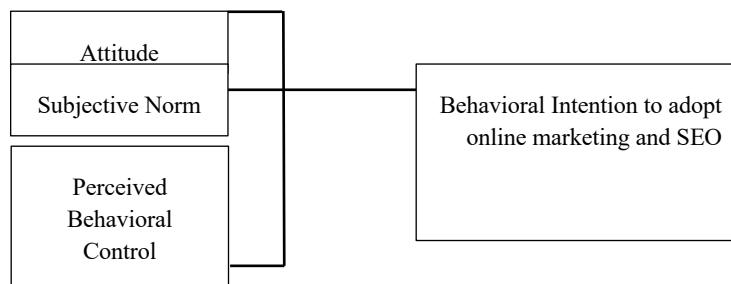


Figure 1 Illustrates the Proposed Relationships between the Three TPB Constructs and SMEs' Behavioural Intention to Adopt Online Marketing and SEO Strategies.

Source: Theory of Planned Behavior (Ajzen, 2001).

2.7 Hypothesis Development

H1: Relationship between Attitude and Intention to Adopt Online Marketing and SEO

Attitude refers to an individual's positive or negative evaluation of performing a particular behavior. According to Ajzen (1991), individuals who perceive a behavior as beneficial are more likely to develop stronger intentions to perform that behavior. In the context of SMEs, entrepreneurs who believe that online marketing and SEO can increase business visibility, improve customer engagement, enhance competitiveness, and generate higher sales are expected to demonstrate greater intention to adopt these technologies.

Previous studies have consistently reported that positive attitudes towards digital marketing significantly influence technology adoption intentions among SMEs. Nordin et al. (2023) determined that Malaysian SMEs with favorable perceptions of online marketing were more likely to engage in digital promotional activities. Similarly, Hoo et al. (2023) reported that entrepreneurs who recognized the strategic benefits of digital marketing exhibited a stronger willingness to invest in digital business practices.

Therefore, the following hypothesis is proposed:

H1: Attitude has a significant positive influence on SMEs' intention to adopt online marketing and SEO.

H2: Relationship between Subjective Norms and Intention to Adopt Online Marketing and SEO

Subjective norms refer to the perceived social pressure from important individuals or groups regarding whether a behavior should be performed. These influences may originate from family members, customers, suppliers, business partners, government agencies, and fellow entrepreneurs.

Within the SME environment, entrepreneurs often rely on information, recommendations, and support from their social and business networks when making strategic decisions. Positive encouragement from influential stakeholders may increase confidence and create favorable perceptions regarding digital marketing adoption.

Bosnjak et al. (2020) highlighted that social influence plays an important role in shaping behavioral intentions across various contexts. Likewise, Razali et al. (2020) indicated that subjective norms significantly influence individuals' intentions to adopt new practices and technologies. In the context of online marketing and SEO, SMEs that perceive stronger support from important stakeholders are expected to exhibit stronger intentions to adopt digital marketing strategies.

Therefore, the following hypothesis is proposed:

H2: Subjective norms have a significant positive influence on SMEs' intention to adopt online marketing and SEO.

H3: Relationship between PBC and Intention to Adopt Online Marketing and SEO

PBC refers to an individual's perception of their capability and ability to perform a particular behavior successfully. This construct reflects both self-confidence and the availability of resources required to implement a behavior.

For SME entrepreneurs, PBC includes digital knowledge, technological skills, financial resources, internet accessibility, availability of technical support, and confidence in managing digital marketing platforms. Entrepreneurs who believe they possess adequate resources and capabilities are more likely to adopt online marketing and SEO strategies.

Previous studies have identified PBC as one of the strongest determinants of technology adoption. Bruce et al. (2023) reported that SMEs with higher digital competency demonstrated stronger adoption intentions toward digital marketing technologies. Similarly, Matosas-López (2024) highlighted that perceived capability significantly influenced business decisions to implement advanced digital marketing practices.

Given the technical nature of online marketing and SEO, PBC is expected to play a crucial role in influencing SMEs' adoption intentions.

Therefore, the following hypothesis is proposed:

H3: PBC has a significant positive influence on SMEs' intention to adopt online marketing and SEO.

2.7.1 Summary of Hypothesis

Table 1. Presents the Summary of Hypotheses Developed in this Study.

Hypothesis	Statement
H1	Attitude has a significant positive influence on SMEs' intention to adopt online marketing and SEO.
H2	Subjective norms have a significant positive influence on SMEs' intention to adopt online marketing and SEO.
H3	PBC has a significant positive influence on SMEs' intention to adopt online marketing and SEO.

These hypotheses were tested using MLR analysis to determine the significance and strength of the relationships between the TPB constructs and SMEs' behavioral intention to adopt online marketing and SEO.

3.0 METHODOLOGY

3.1 Research Design

This study employed a Quantitative Research Design to examine SMEs' intention to adopt Online Marketing and SEO in Anjung Kinabalu, Sabah. A quantitative approach was considered appropriate because it enables the collection of numerical data that can be statistically analyzed to determine the relationships between

variables. The study was guided by the TPB, which posits that behavioral intention is influenced by Attitude, Subjective Norms, and PBC.

A cross-sectional survey design was adopted, whereby data were collected from respondents at a single point in time using a structured questionnaire. This design is widely used in behavioral and technology adoption studies due to its effectiveness in measuring perceptions, attitudes, and intentions among a target population.

The conceptual framework consisted of three independent variables, namely Attitude, Subjective Norms, and PBC, while behavioral intention to adopt online marketing and SEO served as the dependent variable.

3.2 Population and Sampling Technique

The target population of this study comprised SMEs operating in Anjung Kinabalu, Kota Kinabalu, Sabah. Based on records obtained from local business directories and observations conducted within the study area, the estimated population ranged between 300 and 350 SME operators.

This study employed purposive sampling, a non-probability sampling technique that allows researchers to select respondents based on specific characteristics relevant to the objectives of the study. Purposive sampling was considered suitable because not all businesses operating in Anjung Kinabalu actively engage in digital marketing activities.

To be eligible for participation, respondents were required to meet the following criteria:

- i) Registered SME operators.
- ii) Business owners, managers, or individuals involved in business decision-making.
- iii) Individuals directly responsible for marketing or promotional activities.
- iv) Businesses operating within Anjung Kinabalu, Kota Kinabalu.

A total of 100 SME entrepreneurs participated in this study. The sample size was considered adequate for conducting MLR analysis and aligned with recommendations for behavioral research involving multiple predictors.

3.3 Instrument Development

Data were collected using a structured questionnaire developed based on the TPB and previous literature related to online marketing and SEO adoption among SMEs.

The questionnaire consisted of three sections:

3.3.1 Section A: Demographic Information

This section collected respondents' background information, including:

- i) Gender
- ii) Age
- iii) Educational level
- iv) Business ownership type
- v) Business experience
- vi) Type of products sold
- vii) Ethnicity

3.3.2 Section B: Awareness and Understanding of Online Marketing and SEO

This section measured the independent and dependent variables of the study using multiple-item statements adapted from previous TPB studies. The constructs included Attitude, Subjective Norm, PBC, and

Behavioral Intention towards the adoption of online marketing and SEO practices among SMEs in Anjung Kinabalu.

All items in this section were measured using a five-point Likert scale ranging from 1 = Strongly Disagree, 2 = Disagree, 3 = Neutral, 4 = Agree to 5 = Strongly Agree. Respondents were asked to indicate the extent of their agreement with each statement related to online marketing and SEO adoption. The use of a five-point Likert scale is widely accepted in behavioral and marketing research as it enables the systematic measurement of respondents' perceptions, beliefs, and intentions while ensuring consistency and reliability in data collection.

3.3.3 Section C: Theory of Planned Behavior Constructs

This section measured the independent and dependent variables of the study using multiple-item statements adapted from previous TPB studies.

Attitude (ATT)

This construct measured respondents' perceptions regarding the usefulness and benefits of online marketing and SEO for business performance.

Sample item:

"I believe that online marketing and SEO can improve my business performance."

Subjective Norms (SN)

This construct measured the extent to which respondents perceived social influence from important stakeholders regarding online marketing adoption.

Sample item:

"People who are important to me think that I should use online marketing and SEO."

Perceived Behavioral Control (PBC)

This construct measured respondents' confidence and perceived capability in implementing online marketing and SEO practices.

Sample item:

"I have sufficient knowledge and skills to use online marketing and SEO effectively."

Behavioral Intention (BI)

This construct measured respondents' intention to adopt online marketing and SEO in their business operations.

Sample item:

"I intend to increase my use of online marketing and SEO in the future."

3.4 Data Collection

Data for this study were collected through a survey conducted among SME entrepreneurs operating in Anjung Kinabalu, Kota Kinabalu, Sabah. Prior to the survey, respondents were informed about the objectives of the study and assured that all information provided would be treated confidentially and used solely for academic purposes. Participation in the study was voluntary. The survey was administered to SME owners, managers, and

individuals involved in business marketing activities who met the selection criteria established for this study. Respondents were given adequate time to complete the questionnaire and provide their responses. The data collection process was conducted over a specified period to ensure sufficient participation and representation of SMEs operating within the study area. A total of 100 completed questionnaires were successfully obtained and deemed suitable for further statistical analysis. The collected data were subsequently coded, screened, and prepared for analysis using the Statistical Package for Social Sciences (SPSS) software.

3.5 Data Analysis

The collected data were coded and analyzed using SPSS version 29. Several statistical techniques were employed to address the research objectives.

Descriptive statistics, including frequencies, percentages, means, and standard deviations, were used to describe respondents' demographic characteristics and assess their awareness and understanding of online marketing and SEO.

Cronbach's Alpha coefficient was used to evaluate the internal consistency and reliability of the measurement scales. According to Hair et al. (2022), Cronbach's Alpha values of 0.70 and above indicate acceptable reliability.

Normality analysis was conducted to determine whether the data met the assumptions required for parametric statistical testing. Skewness and kurtosis values were examined, and values within the acceptable range of ± 2 were considered indicative of normal distribution. MLR analysis was employed to examine the influence of attitude, subjective norms, and PBC on SMEs' intention to adopt online marketing and SEO.

The regression model can be expressed as follows:

$$BI = \beta_0 + \beta_1 ATT + \beta_2 SN + \beta_3 PBC + \varepsilon.$$

Where:

BI = Behavioral Intention

ATT = Attitude

SN = Subjective Norms

PBC = Perceived Behavioral Control

β_0 = Constant

β_1 – β_3 = Regression coefficients

ε = Error term

The significance level for hypothesis testing was set at $p < 0.05$. Hypotheses were accepted when the p-value was less than the specified significance level.

4.0 RESULTS AND DISCUSSION

4.1 Respondent Demographic Profile

A total of 100 SME entrepreneurs from Anjung Kinabalu participated in this study. The majority of respondents were female (60%), while male respondents accounted for 40%. In terms of age distribution, most respondents were between 21 and 30 years old (39%), followed by those aged between 31 and 40 years (32%). This finding suggests that younger entrepreneurs constitute a substantial proportion of SME operators in Anjung Kinabalu. Regarding educational background, the majority of respondents possessed Sijil Pelajaran Malaysia

(SPM) qualifications (57%), followed by Sijil Tinggi Persekolahan Malaysia (STPM) holders (21%). Only a small percentage possessed a diploma (8%), a bachelor's degree (3%), or a master's degree (1%). This educational profile may partially explain the varying levels of digital literacy observed among respondents. Most businesses were registered as sole proprietorships (72%), reflecting the dominance of micro and small enterprises within the study area. Handicrafts and souvenir businesses represented the largest business category (44%), followed by dried fish products (31%), clothing and accessories (21%), and food and beverage products (4%). The findings indicate that SMEs operating in Anjung Kinabalu largely comprise traditional and tourism-related businesses that may benefit significantly from enhanced digital marketing practices.

4.2 Awareness and Understanding of Online Marketing and SEO

The descriptive analysis revealed that respondents generally possessed a moderate to high level of awareness regarding online marketing. Most respondents were familiar with digital platforms such as WhatsApp, Facebook, Instagram, and TikTok as tools for promoting products and communicating with customers. Nonetheless, awareness of SEO was comparatively lower. Although respondents understood the concept of online marketing, many lacked specific knowledge regarding SEO implementation, keyword optimization, website ranking, and search engine visibility. The findings suggest that SMEs are actively utilizing basic digital communication platforms but have yet to fully exploit more advanced digital marketing strategies. This observation is consistent with previous studies that reported limited technical knowledge among SMEs despite increasing digital adoption (Nordin et al., 2023; Hoo et al., 2023). The results further indicate that SMEs tend to adopt digital marketing tools that are perceived as easy to use and require minimal technical expertise. WhatsApp emerged as the most frequently used platform due to its accessibility, familiarity, and low operational costs.

4.3 Reliability Analysis

Reliability analysis was conducted to assess the internal consistency of the measurement scales used in this study. The results demonstrated satisfactory reliability levels for all constructs.

Cronbach's Alpha values exceeded the recommended threshold of 0.70, indicating acceptable reliability and consistency among the measurement items.

Table 2. Column Heading

An example of a column heading	Column A (t)	Column B (T)
Intention to adopt online marketing and SEO	5	0.970
Awareness	12	0.817
Attitude	9	0.985
Subjective Norms	8	0.980
Perceived Behavioral Control (PBC)	9	0.962

The reliability results indicate that the questionnaire instrument was suitable for measuring SMEs' perceptions and intentions regarding online marketing and SEO adoption.

4.4 Multiple Linear Regression Analysis

MLR analysis was conducted to examine the influence of attitude, subjective norms, and PBC on SMEs' intention to adopt online marketing and SEO. The regression model was statistically significant ($p < 0.001$), indicating that the independent variables collectively explained a substantial proportion of variance in behavioral intention. The model recorded an R^2 value of 0.931, suggesting that 93.1% of the variation in SMEs' intention to adopt online marketing and SEO can be explained by attitude, subjective norms, and PBC.

Table 3. Demonstrates the MLR Result

Predictor	B	Std. Error	β (Standardized)	t-value	p-value	Decision
(Constant)	-0.098	0.140	–	-0.703	0.484	–
Attitude	0.304	0.090	0.301	3.380	0.001	Supported
Subjective Norms	0.291	0.101	0.290	2.869	0.005	Supported
Perceived Behavioral Control (PBC)	0.447	0.084	0.398	5.299	< 0.001	Supported

- $R = 0.965$
- $R^2 = 0.931$
- Adjusted $R^2 = 0.929$
- $F = 433.308$, $p < 0.001$
- Dependent Variable: Intention to adopt online marketing & SEO

The findings indicate that all three TPB constructs significantly influence SMEs' behavioral intention to adopt online marketing and SEO.

4.5 Discussion

4.5.1 Influence of Attitude on Behavioral Intention

The findings demonstrate that attitude significantly influences SMEs' intention to adopt online marketing and SEO. Entrepreneurs who perceive digital marketing as beneficial, useful, and capable of enhancing business performance are more likely to adopt these technologies.

This result supports the TPB proposed by Ajzen (1991), which suggests that favorable evaluations of a behavior contribute positively to behavioral intention. The finding is also consistent with Nordin et al. (2023), who reported that positive perceptions toward digital marketing significantly increase SMEs' willingness to engage in online promotional activities. The result suggests that increasing awareness of the benefits associated with SEO and online marketing may further strengthen adoption intentions among SME entrepreneurs.

4.5.2 Influence of Subjective Norm on Behavioral Intention

Subjective norms were found to significantly influence behavioural intention. This finding indicates that social influence plays an important role in shaping SMEs' adoption decisions.

Entrepreneurs may be encouraged by recommendations from customers, family members, peers, government agencies, and successful business operators. Such social influence can create positive perceptions regarding the value and necessity of digital marketing adoption.

The result is consistent with Bosnjak et al. (2020) and Razali et al. (2020), who highlighted the importance of social influence in determining behavioral intentions across various contexts.

4.5.3 Influence of Perceived Behavioral Control on Behavioral Intention

PBC emerged as the strongest predictor of behavioural intention. This finding indicates that SMEs are more likely to adopt online marketing and SEO when they feel confident in their ability to use digital technologies effectively.

The result suggests that technical skills, digital literacy, financial resources, and access to technological infrastructure play crucial roles in determining adoption behavior.

The finding aligns with previous studies by Bruce et al. (2023) and Matosas-López (2024), which identified perceived capability as a major determinant of digital technology adoption among SMEs.

The strong influence of PBC highlights the importance of training programmes, digital literacy initiatives, and institutional support mechanisms in facilitating digital transformation among SMEs.

4.6 Summary Findings

The results indicate that SMEs in Anjung Kinabalu generally possess positive perceptions toward online marketing and SEO. Nevertheless, practical implementation remains limited due to technical capability constraints.

All three TPB constructs significantly influence behavioral intention, supporting the theoretical assumptions of the TPB. Among these variables, PBC exerts the strongest influence, emphasizing the importance of knowledge, skills, confidence, and resource availability in encouraging SMEs to adopt digital marketing technologies.

5. CONCLUSION, IMPLICATIONS AND RECOMMENDATIONS

5.1 Conclusion

The increasing importance of digital technologies has transformed the way businesses operate and compete in today's marketplace. As consumer behavior becomes increasingly dependent on digital platforms, SMEs are required to adapt by embracing online marketing and SEO strategies to remain competitive and sustainable. This study examined the factors influencing SMEs' intention to adopt online marketing and SEO among entrepreneurs operating in Anjung Kinabalu, Sabah, using the TPB as the underpinning theoretical framework.

The findings revealed that SMEs generally possess positive perceptions towards online marketing and recognize its potential to enhance business visibility, customer engagement, and overall business performance. However, although awareness of online marketing was relatively high, knowledge and application of SEO practices remained limited. This suggests that while SMEs have begun utilizing digital platforms for promotional purposes, the adoption of more advanced digital marketing strategies is still in its early stages.

The results further demonstrated that attitude, subjective norms, and PBC significantly influence SMEs' intention to adopt online marketing and SEO. Among these variables, PBC emerged as the strongest predictor of behavioral intention. This finding indicates that entrepreneurs' confidence in their ability to use digital marketing tools, together with their access to relevant knowledge, skills, and resources, plays a critical role in shaping adoption decisions. Therefore, improving digital competencies and reducing technological barriers are essential to encouraging greater adoption of online marketing and SEO among SMEs.

Overall, the study confirms the applicability of the TPB in explaining digital marketing adoption behavior among SMEs and contributes empirical evidence to the growing literature on SME digital transformation in Sabah.

5.2 Theoretical Implications

This study contributes to the existing body of knowledge by extending the application of the TPB within the context of online marketing and SEO adoption among SMEs. While previous studies have examined technology adoption in various settings, empirical evidence focusing on SMEs in Sabah remains relatively limited. The findings, therefore, provide valuable insights into how behavioral factors influence entrepreneurs' decisions to adopt digital marketing technologies in a regional business environment.

The significant relationships observed between attitude, subjective norms, PBC, and behavioral intention provide support for the fundamental assumptions of TPB. The findings demonstrate that technology adoption decisions are influenced not only by perceived benefits but also by social influence and perceived capability. This reinforces the relevance of TPB as an effective framework for understanding digital marketing adoption among SMEs.

Furthermore, the identification of PBC as the strongest predictor of behavioral intention contributes to the growing literature emphasizing the importance of self-efficacy and resource availability in technology adoption. The findings suggest that entrepreneurs who possess greater confidence in their digital capabilities are more likely to

adopt online marketing and SEO practices. This insight enriches current understanding of SME digital transformation and provides a basis for future studies examining the role of capability-related factors in technology adoption.

5.3 Practical Implications

The findings of this study offer several practical implications for policymakers, government agencies, SME support institutions, and entrepreneurs. As digital technologies continue to reshape business operations, efforts to enhance SMEs' digital readiness have become increasingly important.

The significant influence of PBC highlights the need for targeted initiatives aimed at strengthening digital competencies among SME entrepreneurs. Government agencies and business development organizations should prioritize training programs that focus on practical digital marketing skills, including social media marketing, website management, SEO implementation, digital advertising, and content creation. Such programs can improve entrepreneurs' confidence and capability in utilizing digital technologies effectively.

In addition, agencies such as SME Corp Malaysia, Malaysia Digital Economy Corporation (MDEC), and other entrepreneurship support organizations may use the findings to design more targeted intervention programs that address specific barriers faced by SMEs. Beyond financial assistance, continuous mentoring, technical support, and advisory services are essential in helping entrepreneurs navigate the challenges associated with digital transformation.

The findings also suggest that social influence plays an important role in encouraging technology adoption. Business associations, entrepreneur networks, and industry leaders can contribute by promoting knowledge sharing, best practices, and success stories related to online marketing and SEO adoption. Such collaborative efforts can create a more supportive ecosystem that encourages wider adoption of digital marketing practices among SMEs.

5.4 Limitations of the Study

Despite its contributions, this study is subject to several limitations. First, the study was conducted exclusively among SMEs operating in Anjung Kinabalu, Sabah. Consequently, the findings may not be generalizable to SMEs operating in other regions of Malaysia with different business environments and levels of digital development.

Second, the study adopted a cross-sectional research design, whereby data were collected at a single point in time. As a result, the study was unable to examine changes in adoption behavior over time or establish causal relationships between variables.

Third, the study focused solely on the three TPB constructs. Other factors that may influence online marketing and SEO adoption, such as digital literacy, innovation readiness, government support, technological infrastructure, and perceived usefulness, were not included in the model. Incorporating these variables may provide a more comprehensive understanding of SMEs' digital adoption behavior.

Finally, the study relied on self-reported responses from respondents. As with most survey-based studies, the possibility of response bias cannot be eliminated.

5.5 Recommendations for Future Research

Future studies should expand the scope of investigation by including SMEs from different districts and states across Malaysia to enhance the generalizability of the findings. Comparative studies between urban and rural SMEs may also provide valuable insights into the varying challenges and opportunities associated with digital marketing adoption.

Researchers may further extend the theoretical framework by integrating TPB with other technology adoption theories such as the Technology Acceptance Model (TAM), the Diffusion of Innovations (DOI), or the

Technology Readiness Index (TRI). Such integration could provide a more comprehensive explanation of SMEs' digital adoption behavior.

Additionally, future studies should consider examining the role of digital literacy, innovation capability, technological readiness, and government support in influencing online marketing and SEO adoption. Longitudinal studies may also be conducted to investigate how adoption intentions and behaviors evolve over time as SMEs gain greater exposure to digital technologies.

Finally, future research could move beyond adoption intention and investigate the actual implementation and effectiveness of online marketing and SEO strategies in improving SME performance, competitiveness, and business sustainability.

6. CONCLUSION, IMPLICATIONS AND RECOMMENDATIONS

6.1 Conclusion

This study investigated SMEs' awareness and intention to adopt online marketing and SEO in Anjung Kinabalu, Sabah, using the TPB as the guiding theoretical framework. Specifically, the study examined the influence of attitude, subjective norms, and PBC on SMEs' intention to adopt online marketing and SEO strategies.

The findings revealed that SME entrepreneurs generally possess positive awareness and perceptions of online marketing. Most respondents actively utilize social media platforms such as WhatsApp, Facebook, Instagram, and TikTok to promote their products and communicate with customers. Nevertheless, the understanding and practical application of SEO remain relatively limited among respondents.

The MLR analysis demonstrated that all three TPB constructs significantly influence SMEs' intention to adopt online marketing and SEO. Attitude, subjective norms, and PBC were found to positively affect behavioral intention. Among these variables, PBC emerged as the strongest predictor, indicating that confidence, technical capability, digital knowledge, and resource availability are critical factors influencing adoption behavior.

The study contributes to the growing body of literature on SME digital transformation by providing empirical evidence from Sabah, particularly within the context of SMEs operating in Anjung Kinabalu. The findings also confirm the applicability of the TPB in explaining SMEs' digital marketing adoption intentions.

Overall, the study concludes that enhancing digital competencies and reducing technological barriers are essential for encouraging greater adoption of online marketing and SEO among SMEs.

6.2 Theoretical Implications

This study contributes to the existing literature by extending the application of the TPB to the context of online marketing and SEO adoption among SMEs in Sabah.

The findings support the theoretical proposition that behavioral intention is influenced by attitude, subjective norms, and PBC. The significant influence of all TPB constructs demonstrates the robustness of the framework in explaining digital marketing adoption behavior among SME entrepreneurs.

Furthermore, the study highlights the dominant role of PBC in influencing adoption intentions. This suggests that psychological confidence and perceived capability may be more influential than social influence or personal attitudes when SMEs evaluate technology adoption decisions.

The findings therefore enrich the understanding of digital technology adoption within developing regions and provide empirical support for future TPB-based studies focusing on SMEs.

6.3 Practical Implication

The findings of this study provide important practical implications for policymakers, government agencies, SME development institutions, and entrepreneurs seeking to strengthen digital transformation within the SME sector. As businesses increasingly operate within a technology-driven environment, the ability of SMEs to effectively adopt online marketing and SEO has become a critical determinant of business competitiveness, sustainability, and long-term growth.

The results indicate that PBC is the strongest factor influencing SMEs' intention to adopt online marketing and SEO. This suggests that entrepreneurs are more likely to embrace digital marketing technologies when they possess adequate knowledge, technical skills, confidence, and access to relevant resources. Consequently, initiatives aimed at improving digital competency should be prioritized to enhance SMEs' readiness and ability to participate effectively in the digital economy. Capacity-building programs that provide practical exposure to digital marketing tools, website management, search engine optimization, social media advertising, content creation, and digital analytics would be particularly beneficial in strengthening entrepreneurs' confidence and technological capabilities.

The findings also have important implications for government agencies and organizations responsible for SME development. Institutions such as SME Corporation Malaysia (SME Corp Malaysia), MDEC, the Ministry of Entrepreneur Development and Cooperatives (MEDAC), and relevant state government agencies should continue strengthening digital transformation initiatives targeted at SMEs. While financial incentives and digitalisation grants remain important, greater emphasis should be placed on providing continuous technical support, mentoring programs, advisory services, and practical training opportunities that enable entrepreneurs to apply digital marketing strategies effectively within their businesses. Such support mechanisms can help reduce technological barriers and accelerate digital adoption among SMEs.

Furthermore, the significant influence of subjective norms suggests that social and professional networks play an important role in encouraging the adoption of online marketing and SEO. Business associations, entrepreneur networks, chambers of commerce, and industry leaders can contribute to fostering a supportive environment by sharing successful experiences, best practices, and practical knowledge related to digital marketing implementation. The dissemination of success stories and peer-to-peer learning opportunities may encourage more entrepreneurs to embrace digital technologies and reduce uncertainties associated with technology adoption.

From the perspective of SME entrepreneurs, the findings highlight the importance of continuous learning and adaptation in response to rapid technological developments. Business owners should actively seek opportunities to improve their digital knowledge and marketing capabilities in order to remain competitive in an increasingly digital marketplace. Effective utilization of online marketing and SEO can improve brand visibility, strengthen customer engagement, expand market reach, and enhance business performance. SMEs that successfully integrate digital marketing into their business strategies are likely to be better positioned to respond to changing consumer preferences and market demands.

Overall, the study underscores the importance of creating a supportive digital ecosystem that combines individual capability development, institutional support, and collaborative partnerships among stakeholders. Strengthening these elements will not only increase SMEs' adoption of online marketing and SEO but also contribute to the development of a more resilient, innovative, and competitive SME sector capable of thriving in the digital economy.

6.4 Limitation of the Study

Despite the valuable contributions of this study, several limitations should be acknowledged when interpreting the findings. First, the study was conducted exclusively among SMEs operating in Anjung Kinabalu, Sabah. As a result, the findings may not fully represent the perceptions and behavioral intentions of SMEs operating in other geographical locations with different economic, technological, and business environments. The unique characteristics of SMEs in Anjung Kinabalu may limit the generalizability of the findings to the broader SME population in Malaysia.

Second, the study employed a cross-sectional research design, in which data were collected at a single point in time. While this approach provides valuable insights into respondents' current perceptions and intentions, it does not allow for the examination of behavioral changes over time. Consequently, causal relationships between the study variables cannot be established with certainty. Future studies employing longitudinal research designs may provide a deeper understanding of how SMEs' digital marketing adoption behavior evolves as technological capabilities and market conditions change.

Third, the study focused exclusively on the constructs of the TPB, namely attitude, subjective norms, and PBC. Although these variables were found to significantly influence behavioral intention, other potentially relevant factors were not examined. Variables such as digital literacy, technological readiness, innovation capability, perceived usefulness, government support, and organizational readiness may also influence SMEs' intention to adopt online marketing and SEO. Incorporating these variables in future studies may provide a more comprehensive explanation of digital marketing adoption behavior among SMEs.

Finally, the study relied on self-reported responses collected through a structured questionnaire. Although respondents were assured of confidentiality, self-reported data may be subject to response bias, social desirability bias, or inaccuracies resulting from individual perceptions. Therefore, caution should be exercised when interpreting the findings, and future studies may consider employing mixed-method approaches to enhance the robustness and validity of the results.

6.5 Recommendations for Future Research

Building upon the findings and limitations of this study, several recommendations are proposed to guide future research in the area of online marketing and SEO adoption among SMEs.

Future studies should expand the geographical scope of investigation by including SMEs from different districts, states, and regions across Malaysia. Such an approach would improve the generalizability of the findings and provide a more comprehensive understanding of digital marketing adoption behavior among SMEs operating in diverse socio-economic and business environments. Comparative studies involving urban and rural SMEs would be particularly valuable in identifying differences in digital readiness, technological accessibility, and adoption challenges.

In addition, future researchers may conduct comparative studies across different SME sectors and business categories. SMEs operating in manufacturing, services, retail, agriculture, tourism, and technology-related industries may exhibit different adoption patterns due to variations in business models, customer profiles, technological requirements, and competitive pressures. Understanding these differences would contribute to the development of more targeted digital transformation strategies and support programs.

Future research should also consider extending the theoretical framework by incorporating additional variables that may influence online marketing and SEO adoption. Factors such as digital literacy, innovation readiness, technological competence, organizational support, perceived usefulness, perceived ease of use, and government assistance may provide deeper insights into SMEs' digital adoption behavior. Integrating the TPB with other established theories, such as the TAM, DOI, or TRI, may further strengthen the explanatory power of future research models.

Furthermore, longitudinal studies are recommended to examine changes in adoption behavior over time. Such studies would allow researchers to better understand how SMEs adapt to technological developments, respond to changing market conditions, and improve their digital capabilities as they gain greater experience with online marketing and SEO practices.

Finally, future studies may move beyond behavioral intention and investigate the actual implementation and effectiveness of online marketing and SEO strategies in enhancing SME performance. Examining outcomes such as sales growth, customer acquisition, market expansion, business sustainability, and competitive advantage would provide practical insights into the tangible benefits of digital marketing adoption and contribute to a more holistic understanding of SME digital transformation.

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Authors Contributions

All authors contributed to this publication by delegating tasks according to sections (Introduction, Literature Review, Methodology, Results, Discussions, and Conclusion). All authors have read and approved the final manuscript.

Conflict of Interest

There is no conflict of interest associated with this publication.

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