MJBEM

Malaysian Journal of Business, Economics and Management

journal homepage: https://mjbem.com.my/

The Determinants of Startups' Financial Sustainability: The Mediating Role of Social Media Adoption

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KEYWORDS

Social Media Adoption
Financial Sustainability
Startups
Malaysia

ARTICLE HISTORY

Received 4 November 2023
Received in revised form 18 November 2023
Accepted 2 December 2023
Available online 16 December 2023

ABSTRACT

Startups have become a vibrant and dynamic sector of the world economy, and information technology plays a vital role in improving their productivity and competitiveness. Using the Technology-Organization-Environment (TOE) framework, this study investigated the determinants of social media adoption among Malaysian startups and examined the mediating role of that adoption in the relationship between technological, organizational, and environmental factors and startups' financial sustainability. A quantitative, cross-sectional survey design was employed, with data collected from 116 Malaysian startup owners and employees identified through LinkedIn using convenience sampling. The instrument demonstrated acceptable reliability (Cronbach's alpha = 0.812 across 14 items). Path analysis showed that relative advantage (beta = 0.596, $p < 0.001$), managerial capabilities (beta = 0.325, $p < 0.001$), motivation factor (beta = 0.599, $p < 0.001$), and market factor (beta = 0.659, $p < 0.001$) each had significant direct effects on social media adoption. However, regression results indicated that social media adoption did not positively mediate the relationship between the technological, organizational, and environmental determinants and startups' financial sustainability; instead, a negative association with financial performance emerged, largely attributable to elevated marketing expenditure during the early stages of operation. The findings suggest that while Malaysian startups actively adopt social media for branding and customer engagement, the financial payoff of adoption is not immediate. Implications for founders, training providers, and policymakers supporting digitally-driven entrepreneurship in Malaysia are discussed.

1. INTRODUCTION

Startups have become a vibrant and dynamic sector of the world economy, with information technology playing a vital role in improving their productivity and competitiveness. The dynamic business environment has brought fierce competition among startups, requiring owners to interact actively with internal and external stakeholders. Social media (SM) has reshaped the enterprise environment worldwide, with businesses seeking competitive advantage through their SM presence (Ahmad, Bakar, & Ahmad, 2019). In the modern era, firms need to develop skills in using SM to create better marketing campaigns, build long-lasting customer relationships, and obtain an accessible tool for information sharing with connected customers.

Internet penetration in Malaysia has consistently exceeded the global average over the past decade; a 2018 survey found that 87.4 percent of Malaysians were internet users, up from 76.9 percent in 2016, with total users rising from 24.5 million in 2016 to 28.7 million in 2018 (Malaysian Communications and Multimedia Commission, 2018). Social media has evolved into a powerful business tool that allows organizations to reach large numbers of new users while maintaining direct, two-way contact with existing customers, improving brand experience and reputation continuously rather than through the one-way messaging typical of traditional media (Kapoor et al., 2018). This has drawn increasing academic attention to the determinants of organizational social media adoption and the barriers SMEs face in adopting it strategically (Ainin, Parveen, Moghavvemi, Jaafar, & Shuib, 2015; Beier & Wagner, 2016).

Although social media tools are relatively inexpensive and provide access to a diverse consumer base, small and medium-sized enterprises (SMEs) with limited resources and technical knowledge have generally been slower than large firms to adopt them strategically in pursuit of sustainability goals (Ahamat, Ali, & Hamid, 2017). Startups can nonetheless

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https://doi.org/10.56532/mjbem.v2i2.258
2948-4928/

benefit from social media's ease of use, low cost, and capacity to connect with large numbers of potential consumers (Tajudeen, Jaafar, & Ainin, 2018). Despite this potential, research remains limited on how startups specifically choose and use social media channels, and on the mechanisms by which such adoption translates into improved financial sustainability (Garg, Gupta, Dzever, Sivarajah, & Kumar, 2020).

Startups account for 99 percent of the 3.17 million businesses established in Malaysia and are dispersed across rural and urban areas, representing a substantial share of the country's services, trade, agriculture, retail, and manufacturing sectors. Given their importance to national economic growth, there is a need to better understand the role social media plays in enhancing startup performance. There is also comparatively scarce literature on the drivers of social media adoption specifically among startups in developing-country contexts such as Malaysia, even though the broader literature supports the notion that technology adoption generally improves business processes and financial sustainability. This gap matters because, while some researchers have found a significant positive impact of social media adoption on corporate processes and cost reduction relative to traditional methods, it remains unclear whether these benefits extend consistently to the financially constrained, early-stage environment in which most startups operate.

This study therefore extended prior work grounded in the Technology-Organization-Environment (TOE) framework by developing and testing an integrated model of the determinants of social media adoption among Malaysian startups and its implications for their financial sustainability. Specifically, the study sought to: (1) validate the mediating role of social media adoption in the startup context; (2) examine the relationship between technological, organizational, and environmental factors and startups' financial sustainability; (3) investigate the level of awareness of social media adoption's importance among Malaysian startups; and (4) propose an intervention programme based on the findings. Two research questions guided the study: what are the significant determinants of social media adoption contributing to startups' financial sustainability, and does social media adoption affect startups' financial sustainability? The study is significant for startups seeking to understand the rationale behind investing in social media, for academicians and training providers seeking to build better digital entrepreneurship programmes, and for the broader body of local literature, which remains thin on the relationship between social media adoption and financial sustainability in the Malaysian setting.

2. Literature Review

Social media is broadly understood as the collective of applications and platforms through which organizations and individuals create and exchange content, and academic interest in the field has expanded rapidly, with reviews tracing its research trajectory across marketing, information systems, and organizational domains (Kapoor et al., 2018). Financial sustainability, meanwhile, refers to an organization's capacity to generate revenues sufficient to sustain productive processes at a steady or growing rate while producing a surplus over its expenses.

Prior empirical work on social media adoption by organizations has commonly drawn on models of small and medium-sized enterprise (SME) behavior. Ainin et al. (2015) identified the factors influencing social media use among SMEs and its performance outcomes, while Ahamat et al. (2017) examined the factors influencing social media adoption specifically within SMEs facing resource constraints. Beier and Wagner (2016) further identified the practical barriers that prevent SMEs from using social media strategically, and Alford and Page (2015) examined how small businesses adopt marketing technology more broadly. Within this stream, Amin (2007) offered an earlier account of technology usage-intention behavior among users adopting a novel financial technology, illustrating the broader relevance of adoption-intention research to SME contexts.

The Technology-Organization-Environment (TOE) framework, applied in the present study, distinguishes technological factors such as relative advantage and complexity, organizational factors such as managerial support and technical capability, and environmental factors such as market pressure and government support. Tajudeen, Jaafar, and Ainin (2018) demonstrated the impact of social media usage on organizational outcomes, reinforcing the relevance of technological and organizational antecedents, while Iankova, Davies, Archer-Brown, Marder, and Yau (2019) compared social media marketing practices across B2B, B2C, and mixed business models, highlighting how environmental and market-facing considerations shape adoption strategy differently depending on business model. Parveen, Jaafar, and Ainin (2016) similarly found that social media's impact on organizational performance operates jointly with entrepreneurial orientation, underscoring that organizational-level readiness factors condition how much benefit a firm extracts from adoption.

A separate but related literature has focused on the downstream consumer- and revenue-facing effects of social media once adopted. Vithayathil, Dadgar, and Osiri (2020) examined how social media use shapes consumer shopping preferences, Wang, Cao, and Park (2019) linked community experience and commitment on social media to brand attitude and purchase intention, and Alalwan (2018) investigated how social media advertising features shape customer purchase intention. Chatterjee and Kar (2020) reported that social media marketing helps SMEs reduce costs relative to traditional marketing channels, while Garg, Gupta, Dzever, Sivarajah, and Kumar (2020) found that social media analytics practices are linked to business performance through the mediating role of customer engagement. Basri (2017) further argued conceptually that social media offers considerable untapped potential specifically for small businesses and startups seeking to maximize limited marketing budgets.

The scale of the underlying platforms helps explain why organizations feel compelled to adopt them: global social network usage was estimated to grow from roughly 3.6 billion users in 2020 to nearly 4.4 billion by 2025, with Facebook alone exceeding 2.8 billion monthly active users (Statista Research Department, 2021), while the marketer-oriented literature reports that social selling professionals who actively use social selling tools are considerably more likely to meet their sales targets than those who do not (Andrianos, 2017; Schaub, 2014). Malaysia itself has been highlighted as an unusually digitally mature economy in this respect, with organizations increasingly expected by the market and consumers to treat social media as core infrastructure rather than an optional marketing channel (Kane, Palmer, Nguyen Phillips, Kiron, & Buckley, 2017; Mohsin, 2021).

Taken together, this literature supports the general premise that social media adoption is beneficial for organizational performance, yet comparatively few studies have examined the mechanism specifically within startups, where financial resources are limited and marketing expenditure competes directly with early-stage profitability. This study addressed that gap by testing a model in which technological, organizational, and environmental determinants were hypothesized to influence startups' financial sustainability both directly and indirectly through the mediating mechanism of social media adoption, with seven hypotheses (H1-H7) formulated and each tested at the 0.05 level of significance.

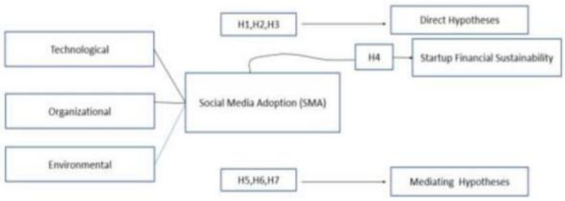

Fig. 1. Conceptual framework of the study

3. METHODOLOGY

This study adopted a quantitative, cross-sectional survey design with no researcher interference, chosen for its capacity to gather and numerically analyze data to explain the phenomena under study. The target population comprised Malaysian startup owners and employees aged between 18 and 55 years, identified through visible startup profiles on LinkedIn with Malaysian nationality and business registration. A non-probability convenience sampling procedure was applied because it allowed the researcher to reach respondents who were readily accessible and willing to participate, an approach commonly used to build an initial understanding of an under-researched population. The self-administered questionnaire was distributed via LinkedIn personal messages; no additional eligibility criteria beyond age and Malaysian business registration were imposed, and every individual within the accessible population had an equal chance of being invited. A total of 116 usable responses were obtained through an online Google Form, chosen for being inexpensive, free of copying costs, and requiring no manual coding, which allowed the results to be readied for statistical analysis almost immediately. The form required all items to be completed before submission, preventing missing data, and respondents were informed of the study's purpose and their confidentiality rights before participating; data collection remained open until the desired sample size was reached.

The questionnaire comprised six sections: general demographic information, technological context, organizational context, environmental context, social media adoption, and financial sustainability. The technological context section measured usage intensity, relative advantage, compatibility, and complexity; the organizational context section measured social media marketing strategy, managerial support, technical capability, managerial capability, and staff motivation; and the environmental context section measured market factors and ecosystem support. All construct items used five-point Likert scales ranging from 1 (Strongly Disagree) to 5 (Strongly Agree), and the questionnaire took respondents approximately 30 minutes to complete. Records that did not meet the age or Malaysian-citizenship criteria were excluded from the final dataset. Data analysis techniques included frequency and percentage distributions for demographic profiling, means and standard deviations for construct-level responses, one-way ANOVA to test differences across demographic groups, chi-square tests of independence to examine associations between categorical variables, and Pearson correlation to gauge the degree of association between the technological, organizational, and environmental constructs and financial sustainability, in addition to reliability analysis and multiple regression to test the study's seven hypotheses at the 0.05 level of significance.

4. RESULTS AND DISCUSSION

Of the 116 usable responses, 60 (51.7%) were male and 56 (48.3%) were female. By age, respondents were fairly evenly spread across bands: less than 25 years (21.1%), 26-35 years (15.8%), 36-45 years (33.3%), 46-55 years (25.4%), and above 55 years (4.4%). Most respondents held a bachelor's degree (61.9%), followed by a master's degree (23.9%), a diploma (9.7%), and secondary schooling (2.7%). In terms of organizational role, owners of the company formed the largest group (42.6%), followed by management (33.9%) and operations staff (18.3%), with the remainder comprising CEOs, partners, freelancers, and other roles. Businesses were concentrated in the Klang Valley, comprising the Federal Territories and Selangor (82.8%), followed by the Southern Region of Melaka and Johor (9.5%) and the Eastern Region of Kelantan and Terengganu (7.8%). Company ownership was predominantly Malay (59.1%), followed by Chinese (22.6%) and Indian (6.1%) owners.

Table 1. Structural Path Results for Determinants of Social Media Adoption

Path	Beta	SE	t	p	Result
Relative Advantage → Adoption	.596	.067	8.851	<.001	Supported
Managerial Capabilities → Adoption	.325	.057	5.682	<.001	Supported
Motivation Factor → Adoption	.599	.058	10.343	<.001	Supported
Market Factor → Adoption	.659	.065	10.145	<.001	Supported

Note. Cronbach's alpha for the 14-item instrument = 0.812.

On business establishment duration, 67.5% of the 114 respondents who answered this item had operated for more than three and a half years, 25.4% for between eight months and three and a half years, and 7% for less than six months. Services (77.2%) were more commonly offered than products

(44.7%), reflecting that many startups offered both. Regarding social media presence, the large majority of respondents' businesses owned social media channels (93%), with only 7% reporting none. Among businesses with social media channels, 81.3% reported leveraging them to minimize marketing cost and maximize profit, 11.6% were unsure, and 9.8% did not. Facebook was the most widely used platform (87.3%), followed by LinkedIn (70.9%) and Instagram (70%), with Telegram, YouTube, TikTok, Twitter, and Clubhouse used to a lesser extent. Regarding profit specifically attributable to social media marketing, 38.1% of respondents did not know the amount, 27.4% reported profit between RM1,000 and RM9,999, and 21.2% reported none of the listed profit ranges, indicating considerable uncertainty among startups about the direct financial returns of their social media activity.

The measurement instrument, comprising 14 items across the core constructs, achieved a Cronbach's alpha of 0.812, exceeding the commonly accepted lower-limit threshold of 0.70 for reliable measures, and indicating acceptable internal consistency reliability. Structural path analysis testing the direct effects of the organizational and environmental sub-constructs on social media adoption showed that all four hypothesized paths were statistically supported. Relative advantage had a significant positive effect on social media adoption impacts (beta = 0.596, SE = 0.067, t = 8.851, $p < 0.001$). Managerial capabilities also showed a significant positive effect (beta = 0.325, SE = 0.057, t = 5.682, $p < 0.001$), as did the motivation factor (beta = 0.599, SE = 0.058, t = 10.343, $p < 0.001$) and the market factor (beta = 0.659, SE = 0.065, t = 10.145, $p < 0.001$). These results indicate that startups perceiving clearer relative advantages from social media technology, possessing stronger managerial capability, exhibiting higher staff motivation toward social media use, and facing stronger market-driven pressures were significantly more likely to report higher levels of social media adoption impact.

A subsequent multiple regression examined the effect of these same determinants (relative advantage, managerial capabilities, motivation factor, and market factor) on the composite business performance/social media adoption outcome variable. The overall model showed a significant constant (B = 0.629, SE = 0.246, t = 2.562, p = 0.012). Relative advantage remained a significant positive predictor (B = 0.259, beta = 0.275, t = 3.626, $p < 0.001$), as did the motivation factor (B = 0.504, beta = 0.575, t = 5.949, $p < 0.001$) and the market factor (B = 0.279, beta = 0.303, t = 3.313, p = 0.001). Notably, managerial capabilities emerged as a significant negative predictor in this regression model (B = -0.173, beta = -0.252, t = -2.718, p = 0.008), diverging from its positive effect in the earlier path analysis. This inversion suggests that once relative advantage, motivation, and market pressure are accounted for simultaneously, greater managerial capability investment may be associated with more conservative or cost-conscious social media deployment rather than expansive adoption, an unexpected but analytically important finding warranting further investigation.

Overall, four of the eleven direct hypothesized paths tested using the full sample of 116 respondents were supported, with the financial impact construct requiring a modified correlational treatment through covariance to proceed with model development, reflecting the complexity of separating adoption-level effects from financial outcome effects within a single model. Critically, despite social media adoption being positively and significantly driven by relative advantage, managerial capability, motivation, and market factors (supporting the antecedents implied in H1 through H4), the hypothesized positive mediating role of social media adoption between the technological, organizational, and environmental determinants and startups' financial sustainability (H5, H6, and H7) was not supported. Instead, the relationship between social media adoption and financial sustainability trended negative. This is consistent with the practical reality that startups typically incur higher marketing and operating costs relative to revenue during their early years of establishing a social media presence and brand visibility, with profitability often not achieved until well into the second or third year of operation, and sometimes not until seven to ten years of operation for small businesses more broadly. The findings therefore suggest that social media adoption predominantly drives marketing and branding activity and overall business visibility in the short run, rather than translating immediately into improved financial sustainability.

5. CONCLUSION

This study examined the determinants of social media adoption and the mediating role of that adoption in the relationship between technological, organizational, and environmental factors and financial sustainability among 116 Malaysian startups. The findings established that relative advantage, managerial capabilities, motivation factor, and market factor are key determinants shaping the extent to which startups adopt social media, each showing statistically significant effects ($p < 0.001$) on social media adoption outcomes. However, the study did not find support for social media adoption as a positive mediator between the TOE-based determinants and startups' financial sustainability; rather, social media adoption showed a negative association with short-run financial performance, most plausibly because startups incur disproportionate marketing and branding expenditure relative to revenue during their early years of social media-driven growth.

These results carry practical implications. For startup founders and managers, the findings suggest that social media investment should be approached as a medium- to long-term branding and customer engagement strategy rather than an immediate driver of profitability, with realistic expectations set regarding the multi-year horizon typically required before digital marketing investments translate into net financial gains. For training providers and policymakers, the study underscores the importance of developing structured digital marketing and social media management training programmes tailored to startups, given that a considerable share of respondents (38.1%) could not identify the profit directly attributable to their social media marketing activity, pointing to a gap in financial literacy around digital investment returns. For academicians, this study contributes to the limited literature examining social media adoption and financial sustainability specifically within the Malaysian startup ecosystem, extending the TOE framework into a context that had previously received little empirical attention.

The study is subject to several limitations that suggest directions for future research. The convenience sampling approach, conducted through LinkedIn among startups that had already adopted social media, limits generalizability and precludes comparison with non-adopting organizations; future studies should sample both adopters and non-adopters to more clearly isolate the incremental effect of adoption, since the present sample's near-universal adoption rate (93%) constrained the variance available to detect stronger relationships between the TOE determinants and financial sustainability. The cross-sectional design also cannot capture how the relationship between social media adoption and financial sustainability evolves over a startup's life cycle; a longitudinal or mixed-methods design would allow researchers to track whether the negative short-run association observed here reverses as startups mature, particularly given that most respondents in this sample had already operated for more than three and a half years (67.5%) yet still reported considerable uncertainty about their social-media-attributable profit. Future research employing more systematic probability sampling and larger, more diverse samples across industries and business sizes would further strengthen the generalizability of these findings to the broader population of Malaysian startups, and would allow researchers to disaggregate the unexpected negative effect of managerial capability observed in the regression model from the positive effect it showed in the path analysis, an inconsistency that itself merits closer empirical attention in future work.

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