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**EXPLORING CORE CATALYSTS FOR ADVANCEMENT IN  
DIGITAL SOCIAL INNOVATION: A DEMATEL ANALYSIS FOR  
YOUNG ENTREPRENEURS**

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**Abstract**

The Decision-Making Trial and Evaluation Laboratory (DEMATEL) technique is used in this study to identify and prioritize the elements driving company development in Digital Social Innovation (DSI) among young entrepreneurs. For data gathering, a multi-method approach comprising surveys and interviews was used. According to the DEMATEL research, "Innovation" and "Financial Resources" emerged as the primary causative variables driving corporate development. In contrast, characteristics such as "Networking," "Knowledge and Expertise," and "Digital Marketing" were found as system-wide consequences. These results provide important insights into the major factors that drive success and scalability in DSI businesses. The research not only identifies opportunities for focused strategic initiatives, but it also aids stakeholders and policymakers in allocating resources to build a sustainable, socially responsible economy. This study, in particular, intends to increase the launch and spread of DSI initiatives among young people, with implications for both theoretical understanding and practical application in creating a digitally-driven, socially innovative economy.

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## 1. Introduction

Digital Social Innovation (DSI) has surfaced as a type of social innovation in Malaysia that utilises novel technologies to address social issues. As per the Malaysia Digital Economy Corporation (MDEC), there has been a surge in the inclination of youthful entrepreneurs towards DSI in recent years. The efficacy of DSI initiatives in Malaysia is contingent upon the ability of professionals to effectively involve users, citizens, and communities in their undertakings. Nonetheless, a dearth of scholarly inquiry exists regarding the principal determinants of commercial expansion in the domain of digital social innovation (DSI) among nascent businesspersons in Malaysia.

The prevalence of youthful entrepreneurship is increasing in Malaysia. The government has been proactively promoting and facilitating the expansion of small and medium-sized enterprises (SMEs), encompassing those spearheaded by youthful entrepreneurs. As per the Malaysia Youth Development Index Report of 2020, there has been a notable surge in the count of youthful entrepreneurs in Malaysia in the recent years. Notwithstanding the expansion, numerous youthful entrepreneurs encounter financial resources, expertise, and information availability obstacles.

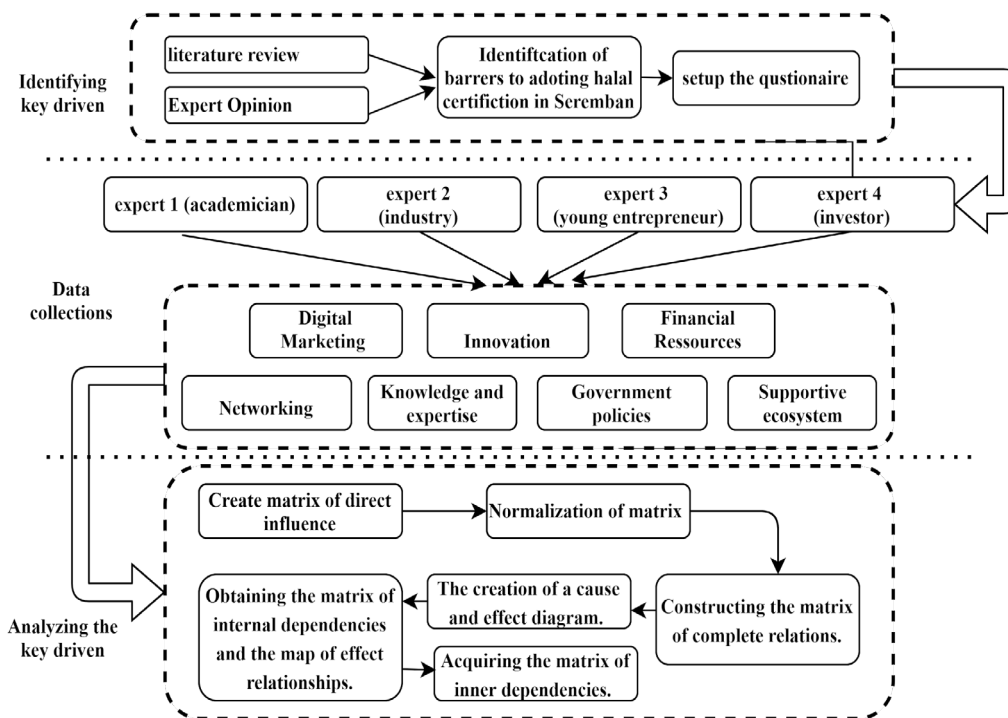
This research aims to examine the primary factors that contribute to the expansion of businesses in the digital social innovation (DSI) sector, as observed among emerging entrepreneurs in Malaysia. To achieve this goal, the study employs the DEMATEL technique, a powerful analytical method used for various applications (Ismail, Al-sharqi, et al., 2023; Ismail, Rodzi, et al., 2023; Rodzi, Amin, et al., 2023; Rodzi, Hazri, et al., 2023) Table 1 displays the prior research on the pivotal factors that drive business expansion in digital social innovation among youthful entrepreneurs.

**Table 1.** Summary of previous research

Key drivers	Description and references
<b>Y1: Digital marketing</b>	Digital marketing involves the strategic use of digital channels to promote products and services, expand reach to a broader audience, establish brand identity, and evaluate the efficacy of marketing campaigns (Masrianto et al., 2022; Qian et al., 2022; Rizvanović et al., 2023; Setkute & Dibb, 2022).
<b>Y2: Government policies</b>	The implementation of government policies, such as tax incentives, grants, and training programs, can foster a conducive business environment that is supportive of young entrepreneurs (Nudurupati et al., 2022; Razmjoo et al., 2022; Simatupang & Widjaja, 2012).
<b>Y3: Knowledge and expertise</b>	Possessing essential skills, experience, and understanding of technology, social media, and data analytics is crucial for individuals to compete and innovate today. This knowledge and expertise are highly valued in various industries and can significantly contribute to professional success (Amouri et al., 2021; Andrade et al., 2022).
<b>Y4: Financial resources</b>	Financial resources are essential for investing in businesses, recruiting personnel, and expanding operations. These resources can be obtained through various means, such as crowdfunding, angel investing, and (Adomako & Ahsan, 2022; Edelman et al., 2016; Hewa Wellalage et al., 2021; Shaw & Sørensen, 2022).
<b>Y5: Innovation</b>	Innovation refers to the capacity to develop novel products, services, or business models that cater to the demands of customers in inventive ways, thereby securing a competitive (Cuntz & Peuckert, 2023; Polas et al., 2023; Williams et al., 2022; Zhao et al., 2023).
<b>Y6: Networking</b>	Networking involves establishing connections with entrepreneurs, mentors, investors, and industry experts to gain valuable insights, advice, and opportunities for collaboration and learning (Bijedić et al., 2023; Chapus & Nordman, 2021; Glinka et al., 2023).
<b>Y7: Supportive ecosystem</b>	The provision of education, mentorship, and infrastructure fosters a conducive ecosystem that cultivates innovation, collaboration, and entrepreneurship among young entrepreneurs (Catala et al., 2023; Gómez et al., 2023; Roundy & Burke-Smalley, 2022; Tiba et al., 2021).

## 2. Methodology

This study employs a mixed-method approach, comprising quantitative and qualitative research methods, as its methodology. The research will employ DEMATEL, a decision-making methodology, to ascertain the principal factors that contribute to the expansion of digital social innovation in the realm of young entrepreneurs in Malaysia. Furthermore, the collection of data on the experiences, challenges, and opportunities of young entrepreneurs engaged in digital social innovation projects will be facilitated through surveys and interviews. Figure 1 depicts the flowchart illustrating the research methodology.



**Figure 1.** The flowchart of Methodology

### 2.1. Phase 1: Literature Review and Expert Opinions on Key Drivers

The initial stage of the methodology involves conducting a comprehensive review of relevant literature and gathering expert opinions on the primary factors that drive business growth in digital social innovation among young entrepreneurs, utilising the DEMATEL approach. The literature review will entail a comprehensive analysis of scholarly journal articles, industry reports, and books pertaining to digital social innovation and entrepreneurship. The present analysis aims to identify pivotal factors and recurring patterns that have surfaced in various studies. These findings will be utilised to formulate a preliminary set of crucial drivers. The consultation process will involve seeking insights from a minimum of two academic experts and one industry specialist to gain a comprehensive understanding of the key drivers that have been identified. To ensure the reliability and validity of the collected data, a structured methodology, such as a survey or semi-structured interview, will be employed.

## 2.2. Phase 2: Data Collection through Interviews with Experts

The second stage of the methodology involves the acquisition of data through comprehensive interviews with four specialists, consisting of a minimum of one youthful entrepreneur and one academician. The objective is to gather their viewpoints on the principal catalysts for business expansion in digital social innovation among youthful entrepreneurs. To ensure uniformity in the data gathered from all interviews, a semi-structured interview guide will be employed. The interviews are planned to be recorded and transcribed in an exact manner for the purpose of analysis. Four experts will be chosen to offer a varied array of viewpoints regarding the primary factors that drive business expansion in digital social innovation among youthful entrepreneurs.

## 2.3. Phase 3: Analyzing Data using DEMATEL

The third stage of the methodology involves the utilization of DEMATEL for data analysis. The DEMATEL methodology shall be employed to model intricate systems and ascertain the causal interdependencies among diverse constituents of the system. The qualitative data analysis approach, specifically thematic analysis, will be utilised to analyse the data gathered from the interviews. Subsequently, the DEMATEL method will be employed to apply the findings. The validity of the results will be ensured by a skilled analyst who will carry out the DEMATEL analysis. Visual aids, such as diagrams or graphs, will be utilised to enhance comprehension when presenting the outcomes of the DEMATEL analysis. The recommendations resulting from the DEMATEL analysis will be substantiated by the data obtained from the review of literature and the interviews conducted with experts.

The steps involved in the DEMATEL method are as follows:

### 2.3.1. Step 1. Creating the matrix of direct influence

This step involves establishing a link between the criteria. Data collected based on the linguistic term shown in table 2.

**Table 2.** Linguistic term

Linguistic Terms	Influence Score
Unrelated	1
Slightly Unrelated	2
Moderately Related	3
Related	4
Very Related	5

### 2.3.2. Step 2. Normalising of the matrix of direct influence

Formulas (1) and (2) are used to get the normalised direct-relation matrix  $A$  from matrix  $S$ .

$$S = s \times A \tag{1}$$

$$s = \min \left( \frac{1}{\max_{1 \leq i \leq n} \sum_{j=1}^n [a_{ij}]}, \frac{1}{\max_{1 \leq j \leq n} \sum_{i=1}^n [a_{ij}]} \right) i, j \in (1, 2, \dots, n) \tag{2}$$

### 2.3.3. Step 3. Constructing the matrix of complete relations

After normalising the direct-relation matrix  $S$ , the total-relation matrix  $M$  is computed using the formula (3), where  $I$  denote the Identity Matrix:

$$M = S(I - S)^{-1} \tag{3}$$

### 2.4. Step 4. The development of a cause-and-effect diagram

The utilisation of  $C + R$  and  $R - C$  is demonstrated in formulae (4) for matrix  $S$ , where  $R$  represents the sum of columns and  $C$  represents the sum of rows. (6). Criteria that exhibit positive  $R - C$  values exert a stronger influence on the remaining criteria. The term "dispatchers" is commonly used to refer to these individuals. Individuals with lower  $R - C$  levels tend to be more susceptible to external influences. The entities are commonly denoted as "receivers." Conversely, the summation of  $R$  and  $C$  denotes the extent of correlation between one criterion and the rest.

$$M = [m_{ij}]_{n \times n}, i, j \in (1, 2, \dots, n) \tag{4}$$

$$R_i = \sum_{j=1}^n [m_{ij}] \tag{5}$$

$$C_i = \sum_{i=1}^n [m_{ij}] \tag{6}$$

#### 2.4.1. Step 5. Obtaining the matrix of internal dependencies and the map of effect relationships

The dataset was mapped utilising the  $(R + C, R - C)$ . The parameter known as the threshold value is employed to denote the degree of influence present between a set of criteria.

## 3. Findings

This section presents the results of a research study that aimed to identify the primary factors that drive business growth in digital social innovation among young entrepreneurs.

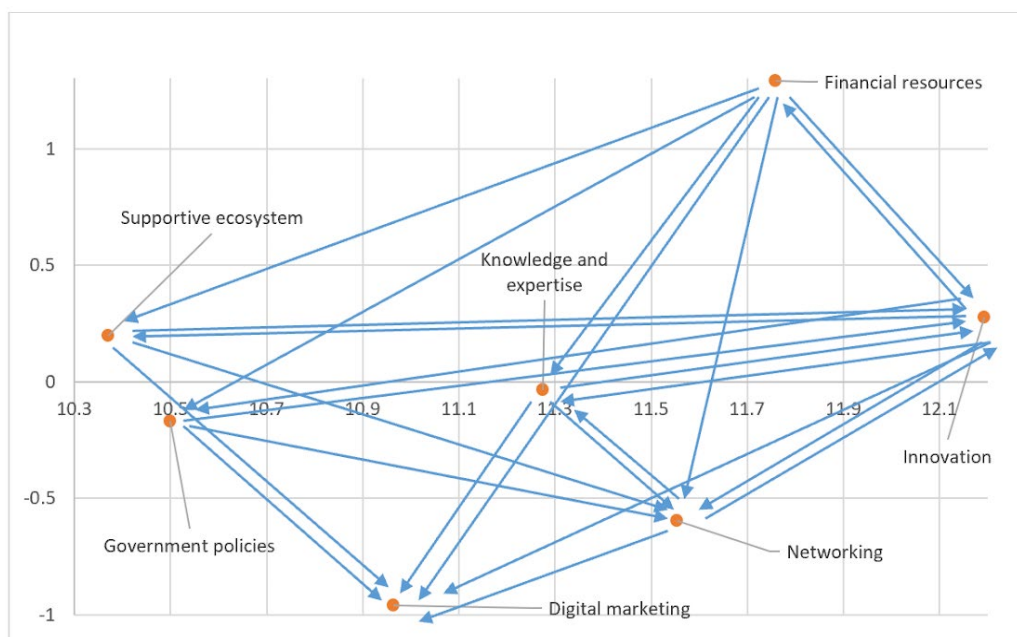
**Table 3.** The result of DEMATEL

	<b>Ri</b>	<b>Ci</b>	<b>Ri + Ci</b>	<b>Ri - Ci</b>	<b>Identify</b>	<b>Ranking</b>
<b>Y1: Digital marketing</b>	5.0018	5.9620	10.9638	-0.9602	Effect	5
<b>Y2: Government policies</b>	5.1641	5.3354	10.4994	-0.1713	Effect	6
<b>Y3: Knowledge anexpertise</b>	5.6195	5.6550	11.2746	-0.0355	Effect	4
<b>Y4: Financial resources</b>	6.5250	5.2343	11.7593	1.2907	Cause	2
<b>Y5: Innovation</b>	6.2346	5.9584	12.1931	0.2762	Cause	1
<b>Y6: Networking</b>	5.4780	6.0748	11.5528	-0.5968	Effect	3
<b>Y7:Supportive ecosystem</b>	5.2836	5.0868	10.3704	0.1968	Cause	7

The presented Table 3 demonstrates the results of a DEMATEL analysis that was conducted as a component of the research focused on the expansion of businesses in the realm of digital social innovation, specifically among young entrepreneurs. The column labeled "Ri" denotes the total for each

row, indicating the cumulative sum of values across all factors. The column labeled "Ci" denotes the total for each factor across all rows. The column labeled "Ri + Ci" displays the cumulative impact obtained by adding the total of each row and each column for every factor. Conversely, the column labeled "Ri - Ci" denotes the disparity between each row's total and each column's total for every factor.

The column labeled "Identify" classifies the factors into two categories, namely causes and effects. The presence of certain factors, categorized as "causal," exerts a notable and favorable impact on the growth of businesses engaged in digital social innovation, particularly among young entrepreneurs. Conversely, factors classified as "consequential" are subject to influence from other factors within the system. The ranking of influential factors driving business growth in digital social innovation is of utmost importance. Based on the analysis conducted, it is evident that the factor of "Innovation" (Y5) holds the highest rank, with a value of 12.1931. This factor is recognized as a causal factor, signifying its significant contribution in facilitating business growth within this particular field. According to the findings, the variable "Financial resources" (Y4) holds the second position in terms of ranking, with a value of 11.7593. This variable is also recognized as a contributing factor, highlighting the significance of young entrepreneurs' ability to obtain financial capital for achieving success. The analysis further demonstrates that the variable labeled as "Networking" (Y6) holds the third position in terms of ranking, with a numerical value of 11.5528. This variable is classified as an effect, indicating that it is subject to the influence of other factors within the system. In a similar vein, the variable labeled as "Knowledge and expertise" (Y3) holds the fourth position in the ranking, with a numerical value of 11.2746. Additionally, the variable denoted as "Digital marketing" (Y1) occupies the fifth position, with a value of 10.9638. These rankings indicate that both variables are considered as effects, implying that they are reliant on other influential factors.



**Figure 2.** The network diagrams

The network diagram as shown in Figure 2, elucidates the interconnections among the factors influencing the growth of businesses in the realm of digital social innovation among young entrepreneurs. Within the scope of our analysis, it becomes evident that the factors of "Financial resources" and "Innovation" assume prominent roles as the principal catalysts, exerting causal effects on all other factors within the system. The variable "digital marketing" exhibits no discernible impact on other variables. In contrast, the influence of "Government policies" and "Knowledge and expertise" is noteworthy, as they both contribute to the development of "Innovation," "Networking," and the establishment of a "Supportive ecosystem." The significance of "Financial resources" is widely recognized as a crucial factor that impacts the achievements of enterprises involved in digital social innovation. This encompasses various aspects such as the efficacy of government policies, knowledge and expertise, innovation, networking, and the supportive ecosystem. The concept of "innovation" emerges as a prominent catalyst, exerting influence on various other factors, thereby signifying its profound implications for the expansion of businesses in the realm of digital social innovation. Moreover, the concept of "Networking" demonstrates a causal impact on various aspects, including "Government policies," "Knowledge and expertise," "Financial resources," and the "Supportive ecosystem." Finally, the "Supportive ecosystem" is shaped by various factors such as "Government policies," "Financial resources," "Innovation," and "Networking."

#### **4. Theoretical and Managerial Implications**

The present research enhances the extant body of knowledge on digital social innovation and entrepreneurship by employing the DEMATEL methodology to pinpoint the principal catalysts for enterprise expansion. This research offers significant contributions by shedding light on the factors that enable the achievement of young entrepreneurs in the realm of digital social innovation. The study's results may serve as a reference for scholars and researchers to pursue additional investigations on the identified catalysts and their influence on enterprise expansion. Furthermore, the research emphasizes the significance of establishing a conducive environment for budding entrepreneurs to cultivate creativity and augment commercial growth.

The study's results hold noteworthy managerial implications for both youthful entrepreneurs and policymakers. The research emphasizes the significance of possessing specialized knowledge and expertise in the relevant business field, building a strong network of professional connections, and having access to financial capital. The results of this study can be utilized by policymakers to formulate advantageous policies that encourage the investment in startup companies, promote the development of innovation hubs and incubators, and facilitate the integration of emerging technologies. The outcomes of the study can be utilized by youthful businesspersons to recognise domains that require enhancement in their commercial activities and to formulate efficacious approaches for the expansion of their enterprise. In general, the research offers significant perspectives for policymakers and emerging entrepreneurs to cultivate an enduring and socially accountable economy.

## 5. Conclusion, Limitations of Study and Future Research

This study has yielded valuable insights into the primary factors that contribute to the expansion of businesses in the realm of digital social innovation, particularly among young entrepreneurs. As a result, it can be concluded that the findings of this research shed light on the key drivers of growth in this field. The study employed the DEMATEL technique to examine the interconnectedness among the drivers and to pinpoint the most pivotal factors that impact the expansion of enterprises. The results suggest that the primary catalysts for business expansion in digital social innovation among youthful entrepreneurs are innovation, financial resources, and supportive ecosystems. Notwithstanding, this investigation is subject to certain constraints, such as the limited number of participants and the potential for partiality arising from the varying viewpoints of the specialists. Subsequent investigations ought to tackle these constraints by executing an extensive inquiry with a broader range of participants and employing various approaches to corroborate the findings. Furthermore, it is suggested that forthcoming studies delve into the precise methodologies and approaches that young entrepreneurs may employ to capitalize on these fundamental catalysts for business expansion within the realm of digital social innovation. The study's results hold significant implications for individuals invested in fostering digital social innovation among young entrepreneurs, including policymakers and entrepreneurs themselves. Policymakers can foster an environment that promotes the expansion of digital social innovation among young entrepreneurs by prioritizing innovation, allocating financial resources, and establishing supportive ecosystems.

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