

Digital business factors affecting characteristics of digital entrepreneurs

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Abstract

This research aimed (1) to explore factors for digital marketing among entrepreneurs in the digital age; (2) to explore characteristics of entrepreneurs in the digital age; and (3) to study factors for digital marketing that contribute to characteristics of digital entrepreneurs.

The research samples were 324 digital entrepreneurs in the Phayao province. The research instrument used was a questionnaire on digital business factors affecting the characteristics of entrepreneurs in the digital age. The research data were analyzed using descriptive statistics, Pearson correlation, and regression analysis.

The results of the study were as follows:

1) The entrepreneurs' behavioral practices were dependent on the application of design thinking at a high level (M=3.94, SD=0.87), on the application of Business Model Canvas at a high level (M= 4.11, SD=0.84), and on the application of digital marketing process at a high level (M=3.87, SD=0.96)

2) The characteristic of digital entrepreneurship that most entrepreneurs possessed was uniqueness (M=4.17, SD=0.84)

3) The three factors for digital business, namely design thinking, Business Model

Canvas, and digital marketing, had a multiple correlation with the characteristics of entrepreneurs in the digital age with the statistical significance at the .05 level. The predictive power was 64.80, and the following was the regression equation.

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<i>Characteristics of entrepreneurship in the digital age = 0.703 + 0.400 (Digital marketing) + 0.232 (Business Model Canvas) + 0.175 (Design thinking)</i> <i>Zcharacteristics of entrepreneurs in the digital age = 0.456 Zdigital marketing + 0.244 ZBusiness Model Canvas + 0.181 Zdesign thinking</i> <i>Keywords: digital business factors, design thinking process, Business Model Canvas, digital marketing, characteristics of digital entrepreneurs</i>
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Introduction

Now is the time when technology progresses at an unprecedented pace, especially in the business world, forcing entrepreneurs to adapt and adjust themselves to a competitive environment and become successful entrepreneurs in the digital age. Today's entrepreneurs are required to use technology and digital platforms as tools to promote their products and services and to create marketing events. This also gives customers convenient access to products and services (Kraus et al., 2018). As the advancement of technology has brought about many digital devices and platforms, it is unavoidable for traditional entrepreneurs to turn themselves into entrepreneurs in the digital age.

Entrepreneurs in the digital age operate their businesses on digital platforms and participate in business activities using various digital tools (Kraus et al., 2018). According to a systematic literature review by Antonizzi and Smuts (2000), the characteristics of digital entrepreneurship are as follows: (1) Self-employment, (2) Work satisfaction,

(3) Entrepreneurship prospect, (4) Entrepreneurial traits, (5) Entrepreneurship can come from opportunity, (6) Digitization allows for better relationships, (7) Digitization does not mean success is clear and easy to entrepreneurs, (8) Employee involvement is crucial, (9) Knowledge management, (10) Traditional organizational structures may slow progress, (11) E-strategies bolster competitive advantage, (12) Entrepreneurship aspiration, (13) Business intelligence can facilitate entrepreneurship and transformation, (14) Disruption comes from new market creation, (15) Disruption comes from existing markets, (16) Production competence comes from technology, (17) Costs of technology, (18) Technology adoption, (19) Technology improves compatibility and working between organizations, (20) Understanding digitization is critical, and (21) Digitization allows for virtual teamwork.

To turn traditional entrepreneurs into digital entrepreneurs, it is important for entrepreneurs to understand the concepts of digital marketing, Business Model Canvas, and the design thinking process (MUHIBBULLAH et al., 2021). Digital marketing is implementing digital technology to create online marketing channels, such as blogs, feeds, podcasts, social networks, and digital platforms, to organize marketing events, build customer relationships, and satisfy customers and prospects. It starts from presenting products and services to customers to creating customer retention. Technology is used to analyze trends and behaviors of customers, leading to appropriate and timely responses to fulfill customer needs. In addition, technology can also help strengthen the relationship with existing customers and enhance the opportunity for retention and purchase of additional products and services (Purwanti, 2021). The marketing trends found in a critic review by Bala and Verma (2018) are (1) Internet marketing, (2) search engine marketing, (3) social media marketing, (4) mobile marketing,

(5) interactive marketing, (6) viral marketing, (7) email marketing, and (8) affiliate marketing.

Digital marketing plays an important role in not only generating sales of products and services and creating strong customer relationships but also attracting the attention of a larger target group. Examples of tools used to accomplish these purposes are SEO promotion, email and mailing lists, contextual advertising, social network advertising, etc. As a result, sales are increased through online channels, enabling entrepreneurs to be competitive in the digital market. Therefore, today's entrepreneurs need to adjust themselves and transform the traditional business into digital business (Bizhanova et al., 2019). In addition, digital marketing promotes the characteristics of digital entrepreneurs (Redondo et al., 2018), while the digital market positively impacts businesses' competitiveness (Lestari et al., 2022).

The four components of the digital entrepreneurship ecosystem are digital actors, digital activities, digital motivations, and digital organization. At the same time, digital marketing is also an essential factor that creates digital entrepreneurs (Elia et al., 2020). Additionally,

the pillars supporting effective digital marketing are (1) digital goals, (2) digital audiences,

(3) digital devices, (4) digital platforms, (5) digital media, (6) digital data, and (7) digital technology (Chaffey et al., 2019). Some most popular digital marketing tools in the digital market include (1)

SEMrush, (2) Deskera CRM, (3) Google Analytics, (4) Google AdWords, (5) Canva, (6) Sotrender, (7) ProofHub, (8) Mail Chimp, (9) Hootsuite, (10) Placeit, (11) Yoast, (12) Buffer, (13) Trello, (14) Desygner, (15) Pixpa, and (16) DocHipo (Deskera, 2022). Also, digital marketing places emphasis on interacting with customers to ensure success in delivering high-quality products and services (Bizhanova et al., 2019).

Digital marketing via e-commerce websites uses a content management system (CMS) so that retailers can have their charm to improve product sales. The benefit of this research is to allow online sales utilizing a CMS to improve business operations and product marketing by employing search engine optimization (SEO) to reduce product marketing expenditures. Business Model Canvas (BMC) is used to create an online business model. Unified modeling language (UML) diagrams, such as activity diagrams, use case diagrams, component diagrams, and system sequence diagrams, are used in system design (Akbar & Ariesta, 2021).

Business Model Canvas is one of the most widely accepted business management tools. It is a planning tool that helps organize and visualize the development of a new business using a 9-block template on a piece of paper. A completed Business Model Canvas helps create a mutual understanding of a company's setup, plans, and core business, allowing everyone to work according to the plans towards their mutual goals as a team in a systematic manner. The business Model Canvas template consists of 9 building blocks, namely (1) customer segments, (2) value propositions, (3) channels, (4) customer relationships, (5) revenue streams,

(6) key resources, (7) key activities, (8) key partners, and (9) cost structure (Osterwalder & Pigneur, 2010).

In addition, Business Model Canvas allows entrepreneurs to be in a position of advantage in business operations and developing unique and outstanding products and services (Sundah et al., 2018). It is a strategic tool used by digital entrepreneurs and start-ups on digital platforms (Sahut et al., 2021) to stimulate investment in digital marketing (Balocco et al., 2019). There are various ways to develop business plans for products and services in the digital age, and one of the most popular options is to adopt the design thinking process, which includes empathizing, defining, ideating, prototyping, and testing, to put forward better products and services (Androutsos & Brinia, 2019).

Design thinking is a process that helps entrepreneurs systematically come up with innovative solutions or products and services according to customer needs. It allows entrepreneurs to understand the pain points encountered by current and prospective customers and

attempt to delineate problems to develop products or services to solve problems accordingly. In this process, a number of ideas are put forward for selection. The selected idea is then turned into a prototype for user testing. The feedback is later used to improve products or services before launching into the market (Sarooghi et al., 2019). The design thinking process consists of five phases, including (1) empathizing, (2) defining, (3) ideating,

(4) prototyping, and (5) testing (Stanford d.school, 2009).

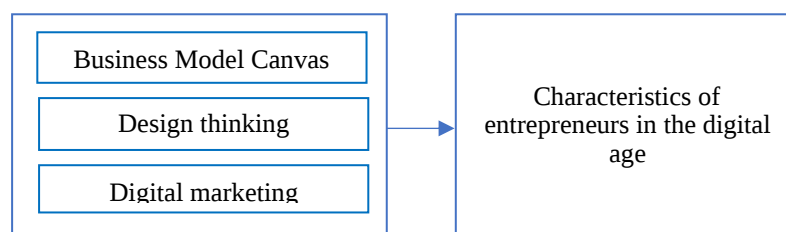
The design thinking process can enhance the ability of digital entrepreneurs to create creative digital economy innovation (Choulyum et al., 2021). This process can be adopted in designing digital entrepreneur development programs (Sarooghi et al., 2019) by emphasizing hands-on, real-world learning experiences in seeking solutions to problems and developing new products and services based on data collected from actual customers. The process transforms traditional entrepreneurs into digital ones (Linton & Klinton, 2019).

As the core business factors include digital marketing, Business Model Canvas, and design thinking process, they contribute to the characteristics of entrepreneurs in the digital age. It would be advantageous for those who design entrepreneur development programs to know how significantly these factors have impacted the characteristics of digital entrepreneurs. They can use this information to arrange appropriate activities to enhance the required characteristics of digital entrepreneurs and help them become successful entrepreneurs in the digital age.

Research Objectives

1. To explore digital business factors among entrepreneurs in the digital age.
2. To explore characteristics of entrepreneurs in the digital age.
3. To study digital business factors that contribute to characteristics of entrepreneurs in the digital age.

Framework



Research Methodology

The present research entitled “Digital business factors affecting characteristics of digital entrepreneurs” is a survey research study.

Research Method

The research population is a total of 1,705 entrepreneurs in Phayao.

The research samples were 324 entrepreneurs in Phayao. The data were collected using simple sampling (Yamane, 1967).

Research Instrument

A questionnaire on digital business factors affecting the characteristics of entrepreneurship in the digital age was created following the steps below.

1. The researcher studied related concepts, theories, and studies to synthesize independent variables, which were three digital business factors that affected the characteristics of entrepreneurship in the digital age, namely design thinking, Business Model Canvas, and digital marketing, and the dependent variables were the characteristics of entrepreneurs in the digital age.
2. A questionnaire was developed with five sections: Section 1 General information (sex, age, entrepreneur type, number of permanent employees, and duration of business operation), Section 2 Characteristics of entrepreneurs in the digital age (37 items), Section 3 Opinion on design thinking (17 items), Section 4 Opinion on Business Model Canvas (10 items), and Section 5 Opinion on digital marketing (21 items). In Sections 2-5, the researcher used a 5-point Likert scale, ranging from strongly disagree (1) to strongly agree (5).
3. The developed questionnaire was validated in terms of language use and construct validity by three experts in digital marketing and two experts in assessment and evaluation. Overall, all items were acceptable, with the index of item-objective congruence (IOC) between 0.60 and 1.00.
4. The questionnaire was tested with 30 entrepreneurs whose characteristics were similar to the samples. The tryout was conducted to test the reliability using Cronbach's alpha method. As a result, the overall reliability of the questionnaire was 0.977. When examining each section separately, it was found that the reliability of 37 items on the characteristics of entrepreneurs in the digital age in Section 2 was 0.944, the reliability of 17 items on the opinion on design thinking in Section 3 was 0.946, the reliability of 10 items on the opinion on Business Model Canvas in Section 4 was 0.905, and the reliability of 21

items on the opinion on digital marketing in Section 5 was 0.958. This suggested that all items were highly correlated.

Data Analysis

1. To illustrate the frequency distribution and dispersion of the collected data, general information about the samples was analyzed using descriptive statistics, including frequency, percentage, mean, and standard deviation.
2. To measure the relationship between variables, the variables were analyzed using Pearson's correlation.
3. To evaluate the effect size of self-regulation on online learning, multiple regression analysis was conducted.

Research Results

Part 1 Analysis results of digital business factors influencing entrepreneurs in the digital age.

According to the findings, the digital business factors that affected the behavior of entrepreneurs in the digital age were digital marketing, Business Model Canvas, and the design thinking process. Table 1 shows the findings' means, standard deviations, and interpretations.

Table 1 Means and standard deviations of the levels of behaviors associated with the use of digital marketing, Business Model Canvas, of digital entrepreneurs (n=324)

Factor	M	SD	Level
Digital goals	4.06	0.85	High
Digital audience	3.95	0.83	High
Digital devices	3.85	0.97	High
Digital platforms	3.75	1.08	High
Digital media	3.84	0.97	High
Digital data	3.88	0.96	High
Digital technology	3.78	1.07	High
Average value	3.87	0.96	High

Overall, it was found that the entrepreneurs had the behaviors associated with the process of digital marketing at a high level

(M=3.87, SD=0.96), ranging from digital goals (M=4.06, SD=0.85), digital audience (M=3.95, SD=0.83), and digital data (M=3.88, SD=0.96), respectively. In addition, they possessed all digital marketing-related behaviors at a high level.

Table 2 Means and standard deviations of the levels of behaviors associated with the use of Business Model Canvas of digital entrepreneurs (n=324)

Factor	M	SD	Level
Customer relationship management	4.13	0.84	High
Business management	4.06	0.88	High
Financial management	4.13	0.80	High
Average value	4.11	0.84	High

In general, it was found that the entrepreneurs had the behaviors associated with the use of Business Model Canvas at a high level (M=4.11, SD=0.84), ranging from customer relationship management (M=4.13, SD=0.84) and financial management (M=4.13,

SD=0.80), and business management (M=4.06, SD=0.88), respectively. They also had these behaviors at a high level.

Table 3 Means and standard deviations of the levels of behaviors associated with the use of design thinking of entrepreneurs in the digital age (n=324)

Factor	M	SD	Level
Empathize	3.99	0.82	High
Define	3.96	0.83	High
Ideate	3.99	0.84	High
Prototype	3.84	0.96	High
Test	3.91	0.91	High
Average value	3.94	0.87	High

Altogether, it was found that the entrepreneurs had the behaviors associated with the use of design thinking at a high level (M=3.94, SD=0.87), ranging from empathizing (M=3.99, SD=0.82) and ideating (M=3.99, SD=0.84), defining (M=3.96, SD=0.83), and testing (M=3.91,

SD=0.91), respectively. They possessed all these behaviors at a high level.

Part 2 Survey results on characteristics of entrepreneurs in the digital age

The collected data regarding the characteristics of entrepreneurs in the digital age were analyzed using descriptive statistics, including means and standard deviations, which were later interpreted in terms of the levels of entrepreneurs' behaviors in the digital age. Table 4 shows the frequency distribution and dispersion of the collected data and the analysis results.

Table 4 Means and standard deviations of the levels of overall behaviors of entrepreneurs in the digital age (n=324)

Factor	M	SD	Level
Technology competence	3.80	0.99	High
Well-roundedness	3.65	1.04	High
Managerial competence	3.96	0.91	High
Self-authenticity	4.17	0.84	High
Average value	3.89	0.95	High

Considering the overview of the data, the entrepreneurs possessed all behaviors of digital entrepreneurs at a high level (M=3.89, SD=0.95), ranging from self-authenticity (M=4.17, SD=0.84), managerial competence, (M=3.96, SD=0.91), and technology competence (M=3.80, SD=0.99), respectively.

Part 3 Analysis results of business factors affecting the characteristics of entrepreneurs in the digital age

The collected data were analyzed using Pearson's correlation coefficient to seek the relationships between the variables in this study. A packaged software was used for statistical analysis and multiple regression analysis to find the effect size of digital business factors distributing to the characteristics of digital entrepreneurs, as shown in Table 5.

Table 5 Analysis results of the relationship between digital business factors and characteristics of digital entrepreneurs (n=324)

Variable	X1	X2	X3	Y
Digital marketing (X1)	1.000			

Variable	X1	X2	X3	Y
Business Model Canvas (X2)	0.685	1.000		
Design thinking (X3)	0.767	0.787	1.000	
Characteristics of entrepreneurship in the digital age (Y)	0.761	0.699	0.722	1.000

Table 5 illustrates the relationships between the independent variables, namely design thinking, Business Model Canvas, and digital marketing, and the dependent variables which are the characteristics of entrepreneurs in the digital age. All independent variables were correlated with the characteristics of digital entrepreneurs at the .01 level of statistical significance, and they were all positive correlations, ranging from 0.685 to 0.787.

In terms of the relationships among the three digital business factors, it was found that they were correlated at the .01 level of statistical significance. All correlations were positive, ranging from 0.685 to 0.787, which agreed with the initial assumption of multiple regression analysis as the correlation values among independent variables were under 0.800 (Everitt, 2009).

The correlations between the dependent variables were tested before conducting a multiple-regression analysis. It appeared that the variables were positively correlated at the .01 level of statistical significance, and the multicollinearity test revealed the correlation values were under 0.80. The three independent variables, digital marketing, Business Model Canvas, and design thinking, were then used in a stepwise multiple regression analysis.

Table 6 Analysis results of multiple correlation and power of prediction of digital business factors and characteristics of digital entrepreneurs (n=324) (Stepwise)

Model	R	R Square	Adjusted R Square	F	Sig.
1	0.761	0.580	0.579	444.320*	.000
2	0.799	0.639	0.637	284.030*	.000
3	0.805	0.648	0.645	196.506*	.000

* Model significant at the level 0.05 (two-tailed)

In a stepwise regression analysis, the independent variables were taken one at a time. The most predictive model was then selected. It

turned out that Model 3 included all three digital business factors, namely digital marketing, Business Model Canvas, and design thinking, which had multiple correlations with the characteristics of digital entrepreneurs at the .05 level of statistical significance with the effect size of 0.805 and the predictive power of 0.648, which meant that these three digital business factors could be used to forecast 64.80% of the characteristics of entrepreneurs in the digital age.

Table 7 Analysis results of digital business factors affecting the characteristics of digital entrepreneurs (n=324) (Stepwise)

Model			b	S.E.		t	Sig.
Digital marketing (X1)			0.400	0.046	0.456	8.634	0.000
Business Model Canvas (X2)			0.232	0.052	0.244	4.452	0.000
Design thinking (X3)			0.175	0.060	0.181	2.896	0.004

a=0.703, R=0.805, R²=0.648, F=196.506*, sig.=.000

Based on the effect size, the variables that affected the characteristics of digital entrepreneurs were digital marketing, Business Model Canvas, and design thinking, respectively. These three digital business factors had multiple correlations with the characteristics of digital entrepreneurs with the effect size of 0.805 and the predictive power of 0.648, which meant that these three digital business factors could be used to forecast 64.80% of the characteristics of entrepreneurs in the digital age. The prediction equation can be written as follows:

Characteristics of entrepreneurship in the digital age = 0.703 + 0.400 (Digital marketing) + 0.232 (Business Model Canvas) + 0.175 (Design thinking)

Zcharacteristics of entrepreneurs in the digital age = 0.456 Zdigital marketing + 0.244 ZBusiness Model Canvas + 0.181 Zdesign thinking

Discussion

Part 1 Analysis results of digital business factors influencing entrepreneurs in the digital age

The entrepreneurs possessed the behaviors associated with the design thinking process at a high level in all aspects, ranging from empathizing and ideating, defining, and testing, respectively. Design thinking is a user-centric approach that digital entrepreneurs use to innovate products and services. At the same time, the products and services are examined and evaluated in the process (Ghorbel et al., 2021). The

design thinking process also allows entrepreneurs to understand the real problems experienced by customers or users. The focus is on customers' pain points, interests, and behaviors (Chouylum et al., 2021).

The entrepreneurs possessed the behaviors associated with the use of Business Model Canvas at a high level in all aspects, ranging from customer relationship management and financial management and business management, respectively. Business Model Canvas is a tool that helps turn traditional entrepreneurs into digital entrepreneurs by enabling them to develop well-rounded business plans. The Business Model Canvas template also covers the evaluation of business success and the selection of business formats. Entrepreneurs can use this template to create digital start-ups on digital platforms (Sahut et al., 2021). Using this business planning tool, entrepreneurs can gain the upper hand in business and offer distinctive and outstanding products and services (Sundah et al., 2018).

The entrepreneurs possessed the behaviors associated with the use of design thinking at a high level in all aspects, ranging from digital goals, digital audience, and digital data, respectively. Digital goals are the expected results from digital marketing activities, such as view counts, customer engagement, and revenue on digital platforms. Digital audiences refer to target customers who are interested in products or services offered on digital platforms. Digital data means information about the business, marketing, and customers collected, stored, compiled, and analyzed on digital platforms for business operations. They are in electronic formats, such as soft files that can be opened and edited on a computer.

Part 2 Survey results on characteristics of entrepreneurs in the digital age

The entrepreneurs possessed all behaviors of digital entrepreneurs at a high level in all aspects, ranging from self-authenticity, managerial competence, and technology competence, respectively. Firstly, self-authenticity is revealed when an entrepreneur is determined to succeed, proactive, and self-assured. For example, entrepreneurs with self-authenticity always search for unique ways to improve their businesses, and they are responsible for their decisions and actions. Secondly, entrepreneurs with managerial competence possess leadership qualities to transform their businesses. They change or invent new business operations, products or services, and business management systems regardless of limitations, risks, and uncertainties in the digital market. In addition, they adjust their business proposals to satisfy the needs and requirements of customers. Finally, technology competence refers to the entrepreneurs' ability to select the appropriate and effective

technology that aligns with the business goals. They know the cost of digital technology and use technology to identify customer needs. For instance, they communicate and share information with customers via online channels. They can estimate the cost of information systems and e-commerce. They understand how to use technology to boost sales of products and services online and how digital databases can be used to analyze the needs for online purchases among customers. These three factors are considered the core characteristics of entrepreneurs in the digital age (Antonizzi & Smuts, 2020).

Part 3 Analysis results of business factors affecting the characteristics of entrepreneurs in the digital age

Based on the effect size of the variables, the three business factors affecting the characteristics of entrepreneurs in the digital age were digital marketing, Business Model Canvas, and design thinking, respectively.

First, digital marketing had the highest contribution to the characteristics of entrepreneurs in the digital age. This is possibly because digital marketing creates promotional activities to generate sales of products and services using digital media (Daud et al., 2022). It also enhances the relationship between customers and products or services using various tools, such as SEO promotion, email and mailing lists, contextual advertising, social network advertising, etc. These tools could help generate sales through online channels and guide entrepreneurs in the right direction to compete with others in the digital market (Bizhanova et al., 2019). The study by Redondo et al. (2018) found that digital marketing promoted the characteristics of digital entrepreneurs.

Second, Business Model Canvas had the second highest contribution to the characteristics of entrepreneurs in the digital age. This could be because Business Model Canvas is a tool for planning and designing business plans that can be communicated, understood, and implemented as they illustrate the whole business structure. This is in line with the research conducted by Dobrowolski & Sułkowski (2021) in which Business Model Canvas was used in a development program for entrepreneurs. It was clear that Business Model Canvas was a crucial and effective tool for business planning as it highlighted the importance of missions, energy accountability, and impacts on stakeholders.

Lastly, design thinking had the third highest contribution to the characteristics of entrepreneurs in the digital age at the highest level. This is likely due to the fact that design thinking is a process broadly used to organize activities in entrepreneur development programs. This is in accordance with the study by Sarooghi et al. (2019), which

adopted the design thinking process as a research framework to develop digital entrepreneurs. As a result, the design thinking process could help promote key characteristics of digital entrepreneurs.

In conclusion, digital marketing, Business Model Canvas, and design thinking are essential factors contributing to the characteristics of entrepreneurs in the digital age. Therefore, the concepts of digital marketing, Business Model Canvas, and design thinking can be used to design activities in entrepreneurship development programs.

Recommendation

Recommendations for Future Applications

It is recommended that the findings of this study be used to develop the characteristics of entrepreneurs in the digital age. Related agencies can design activities based on digital marketing concepts, Business Model Canvas, and the design thinking process. The activities may create awareness of ideas and digital tools in pursuing digital marketing among entrepreneurs and help them develop business models using the design thinking process. The activities can help promote their digital entrepreneurship.

Recommendations for Future Research

There should be activities using digital marketing ideas and Business Model Canvas together with design thinking. These activities should be tried out with entrepreneurs to promote their characteristics of digital entrepreneurship.

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