ANALYTIC HIERACHY PROCESS OF 7'S INDEX IN DIGITAL INNOVATION MARKETING OF LEADING TECHNOLOGY ORGANIZATIONS INTO THE METAVERSE

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Abstract

This quantitative research focuses objectively on the analytic hierarchy of 7's index process in search of marketing management excellence indicators in the Metaverse of leading technology organizations in Thailand. A questionnaire was used as a tool for research data collection, and the statistics used for data analysis were PAWS version 18.0 and the AHP Online System (AHP-OS). The research findings indicated that the top five marketing management excellence indices for leading technology organizations to the Metaverse were the following factors: the structure of the organization (λ = 0.405); staff (λ = 0.205); strategy (λ = 0.196); skill (λ = 0.096); and style (λ = 0.043). Five excellent factors of digital innovation were sustainable growth (λ = 0.128); human resource development (λ = 0.112); brand strength (λ = 0.110); new creative innovation development (λ = 0.085); and green technology (λ = 0.072) respectively. The research results highlight the advantages and value benefits of marketing activity, adopting Metaverse for future growth. In addition, the methodology and results of this study are expected to provide insight into the success of Metaverse's transformation to thrive in increasing competition.

Keywords: Digital Innovation, Internet, Marketing Adoption, Marketing Management Excellence, The Metaverse

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Introduction

The competitiveness in the digital business is affecting long-term value creation. Most entrepreneurs are forced to adapt and start defining their strategies around the diverse demands for products and services on digital channels in different competitive formats for consumers. The business focus is on meeting customers' needs and wants for satisfaction. Entrepreneurs must realize the sound and good practices of marketing in its specialization, specifically in search of excellence and surreal managerial performance. Taking opportunistic advantages in attracting customers requires flexibility in acquiring strategies and a new challenge environment perspective (Laksitamas et al., 2021). Thailand's AIS, TRUE, DTAC, and 3BB are leading the way in technological competitiveness, especially in link pins and internet bandwidth. The challenge is competitive market responsibility and opportunities with the ability to apply marketing management for excellence aligned with current business growth and prosperity in quality aspects (Hamid et al., 2019).

Marketing management for excellence capability is a professional path requiring managerial systems and applications to engineering system combinations to link and adapt every system of managerial productivity for marketing excellence and efficient quality development (Alsharari, 2021). They are comprised of 7 components (7's in search of excellence): structure of the organization; a system of value; style of management; staff management; skill; strategy; and share of value (Peters & Waterman, 2015). Software and hardware factors in the search for excellence create and sustain indicators as standardized indices in business administration. The coming trend of technology application has changed dramatically from traditional to the Metaverse business. Metaverse business, such as Microsoft, Nike, Tinder, NVIDIA, Sea, Amazon, and Apple leading the charge in the United States, along with some other organizations such as Tencent in Hong Kong, Sony in Japan, and Samsung in South Korea. The COVID-19 pandemic has been a tremendous driving force for the increasing demand for the "Metaverse" due to most consumers staying exclusively in home isolation for everyday life (traveling, working, adventure). There is a missing link for the concept of the "Metaverse", which may enter our lives through VR (Virtual Reality) and AR (Augmented Reality). These current technologies will correspond in connection with the internet between reality and virtual reality, such as PlayStation, where players wear VR as support devices to view all 360 degrees of information (Akter & Wamba, 2016). Users can participate in activities like music festivals, advertising sales, or art sales called NFTs (Busalim, 2016). Other advantages of the Metaverse development also benefit real-life situations such as medical operations (Remote Areas), engineering (Dangerous Areas), commerce (AR trial products), and entertainment (games, concerts) (Laksitamas et al., 2021). Metaverse is a computer-generated 3D space simulation of social, continuing and sharing of time and space into the virtual world of virtual existence with physical and

digital context. Indeed, the Metaverse is along with the universe composed of virtual words, space rooms and people (Damar, 2021).

The Metaverse position in Thailand might not develop the technology to compete with world-class organizations. However, Thailand's position is ready for the Metaverse. Thailand should be prepared to lead with this technology; the crucial component that matters most in the world of Metaverse travel is high-speed internet connections for immediate and continued response devices such as glasses, VR, AR Gloves, and smartwatches. Thailand should indirectly take advantage as producers of futuristic technological changes and global consumers (Baoguo & Laksitamas, 2020).

With those as mentioned above, the researchers' approach to investigating the indicators of marketing and digital innovation excellence of leading technology organizations in the Metaverse era using the Analytic Hierarchy Process (AHP) for the complex, problematic solution and with alternative solutions (Veisi et al., 2022) using the comparative analysis of fairness as designated steps. Hence, matching alternative analysis can be easily performed and efficient. The research results will highlight the advantages of digital development search for excellence in the marketing management lead a quality service policy of modern organizations. Additionally, guidelines can be enhanced to direct business operations for survival and future growth.

Objective

To study the analytical hierarchy process of the 7'S index process in search of marketing management excellence indicators in the Metaverse of leading digital technology organizations in Thailand.

Literature Review

The concept of excellence in marketing management on the proposed model can be used in marketplaces that support the organization's management to become excellent and upscale the success of technological operations or fulfill administration depending on at least seven interrelated variables. The 7's marketing model was developed by Peters (2011), and the topics included Structure, Strategy, Systems, Style, Staff, Skills, and Shared Values (Figure 1). These topics analyze organizations' effectiveness by looking at these seven core components contributing to successful organizations (Gola, 2020).

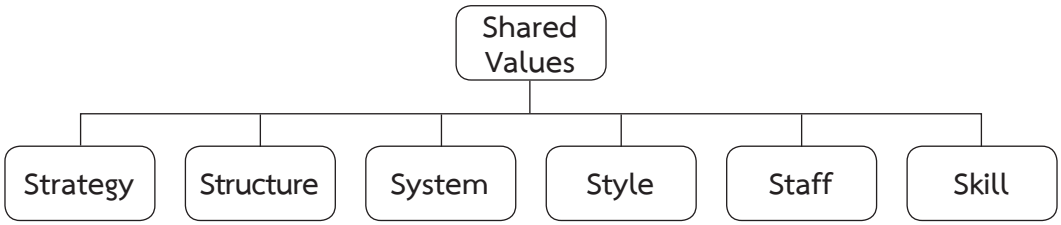


Figure 1 McKinsey 7's framework (extracted from Peters, 2011)

Strategy refers to actions in the external environment (Alshaher, 2013) that should enable the organization to defend or enhance its competitive position. Along with the roles of structure and responsibilities that are accountable and answerable to whom in the entire hierarchy, suggesting that the critical challenge related to the structure is the ability to focus on those dimensions or design parameters (Gola, 2020). The degree of formalized behavior inside a unit, the decentralization of decision making, and the need for horizontal coordination mechanisms are all factors to consider (Channon & Caldart, 2015). Systems are the formal and informal procedures that support the strategy and structure of the organization (Channon & Caldart, 2015). Whether members of the organization make them a priority during the organizational transformation go technology process. The style of organizational culture: the dominant values, beliefs, and norms that develop over time and become relatively enduring features on how they focus time on marketing activities, predominantly from market-oriented operations and taking necessary risks (Alshaher, 2013). Staff is considered "hard" (pay and appraisal system) issues and "soft" (morale, attitude, and motivation), securing and attracting young talented executives. In this case, skills are the elements that enable the corporation to obtain success factors that characterize their business. In conclusion, shared values at the model's core are superordinate goals targeting shared values. The organization pivots values to define essential beliefs and aspirations and form the core of its culture. Organizations in need of a change in their values endeavor to undergo dramatic transformations that involve fundamental reappraisals of all aspects of activities.

Digital marketing with the advanced development of the Internet of Things (IoT) and the dramatic increase of internet and cell phone users, online and digital marketing has become the primary leading trend. According to recent data, more than 4.66 billion internet users account for 59.5%, 5.22 billion mobile phone users account for 66.6%, and 4.20 billion active social media users account for 53.6% of the world's total population.

The Metaverse concept formulates the future and investment opportunities in the virtual world in idea with the real-world environment and the combined technology in a "virtual world community" mixture with materials in circulation and linking with the environment, such as exercise, concert attendance, or remote meetings in real-time.

At the same time, the activities are performed in the home environment.

Virtual reality and augmented reality are mainly technology that supports the internet connection to the virtual environment. The advantages of the Metaverse will have opportunistic development in real-life situations in dimensional of medical practice (remote operation)/engineering (risk areas exploration), commerce (product test with AR), and entertainment (games, concerts). Thailand is not a leader in the Metaverse world. However, Thailand is ready for the Metaverse, and leadership in the future is crucial for the infrastructure to travel in the Metaverse world. Firstly, sales highway interact speed for service receivers both mobile and broadband investment are for digital systems development effectively. Business organizations in internet providers, system integrators, and software engineering will benefit tremendously from superhighway speeding demand; secondly, devices (glasses, VR, AR gloves, smart watches, or any new future gadgets) (Laksitamas et al., 2021).

The concept of the Analytic Hierarchy Process (AHP) is a method for organizing and analyzing paired complex decisions using mathematics and psychology. AHP provides pairwise comparison (location, selection, selective innovation support investment) using multiple decision principles under significant factor consideration based on which goals criteria study must be characterized on priority staged levels. The less critical stage levels will be marketed as sub-criterion respectively till the selection of alternations, which is the lowest stage levels of hierarchy analysis under pairwise comparison, where important values in pairwise comparison will be translated into the numbers of 1 to 9. The results of the significant comparison between factors and including standard proportional measurement of such complex decisions will be compared from 1 to 9 by Aij at tabulation line i. Then j equals counting numbers meaning the results significant comparison between Ai and Aj factors by applying proportions in a comparative decision from 1 to 9 as shown in Table 1.

Table 1 A matrix used to show comparisons in pairs

Decision Measurement		Factors			
		A1	**A2**	**A3**	**Aj**
Factors	**A1**	A11	A12	A13	A1j
	A2	A21	A22	A23	A2j
	A3	A31	A32	A33	A3j
	Ai	Ai1	Ai2	Ai3	Aij

After obtaining comparative results in each pairwise, the weight of each calculation is analyzed to get numbers illustrating attribute values of each clearing measurement leading to hierarchical values for each maximum selective values alternative decision (Defence Technology Institute, 2020).

In conclusion, the Analytic Hierarchy Process (AHP) is the mathematical analysis and decision process for complex decisions by applying alternative problem solutions to different measurements. These generally have conflicted objectives or would not be able to comprehensively identify significant factors between each objective on different measurements of AHP (Yalcin et al., 2011; Shen et al, 2015). This technique was the most appropriate for selective factored decisions for "In search of excellence in digital innovation marketing management among leading technology organizations into the Metaverse". For this research study used AHP computer programming software packages for decision analysis.

Conceptual Framework

The Metaverse concept of "in search of marketing management excellence" for this research study is linked with the significance of the future world and investment opportunities using the Analytic Hierarchy Process (AHP) technique for analysis through mathematical and psychological science decisions. The concept was integrated for applied research in digital innovation among Thailand's leading technology organizations into the Metaverse, as shown in Figure 2.

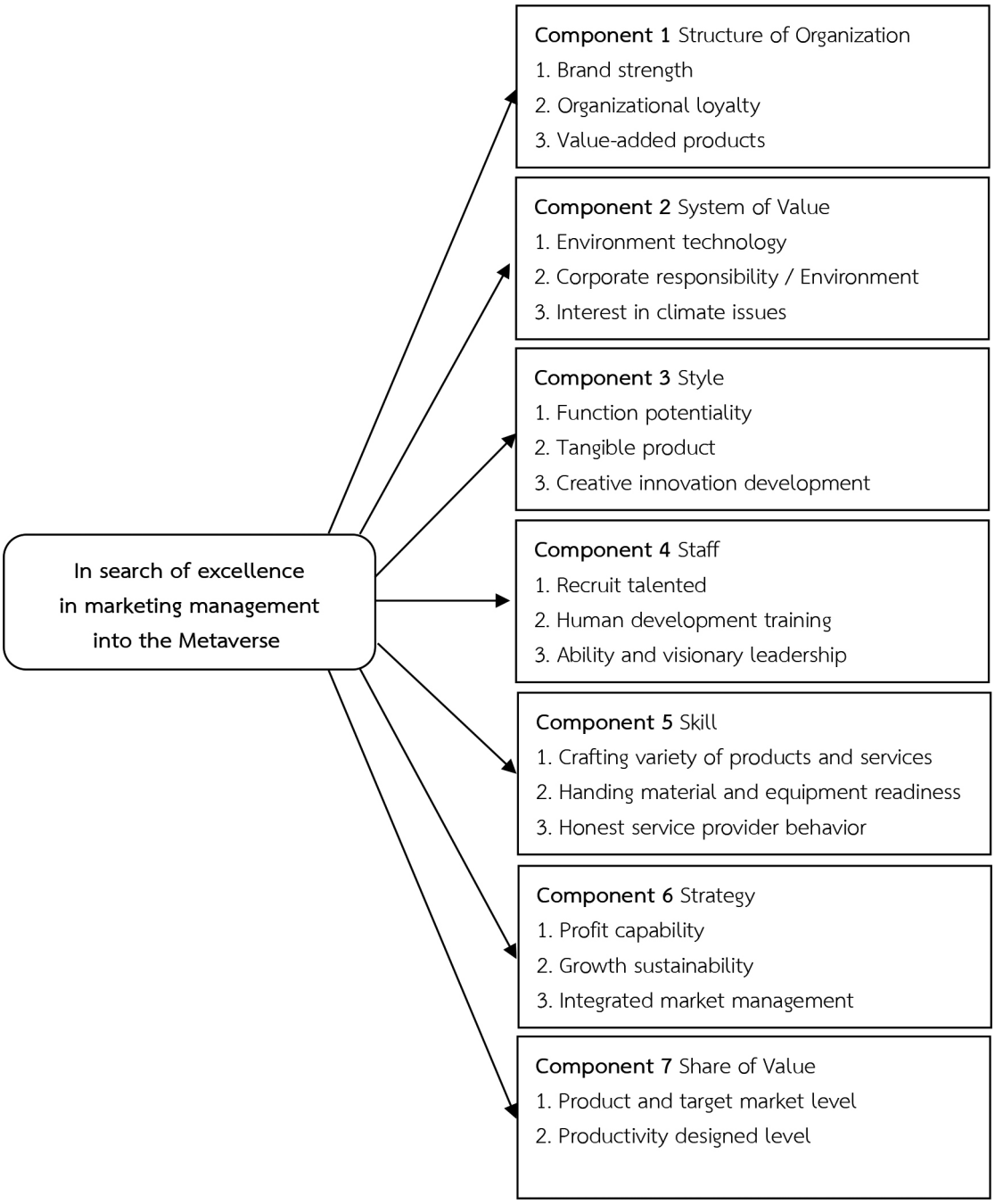


Figure 2 Conceptual framework

Hypothesis

The question hypothesis "Analytic hierarchy process of 7's index in digital innovation marketing of leading technology organizations into the Metaverse" What are they top five composed of components and factors indication?

Methodology

The quantitative research method by questionnaire approach was undertaken through 9 experts' opinions. Then all marks received from the questionnaires were taken for indicators' calculation using the Analytic Hierarchy Process (AHP) technique. The population

and sample were taken from operations, marketing and engineering departments' personnel who work in the top 4 leading technology organizations. These organizations are registered on the Stock Exchange of Thailand as public companies. They include (Advanced Info Service Public Company Limited (AIS), True Corporation Public Company Limited (TRUE), Total Access Communication Public Company Limited (DTAC), Jasmine International Public Company Limited (JAS), and the internet service provider 3BB. Due to the large population size, the statistical figure shows statistical uncertainty. It is an understanding that personnel moves in and out of organizations regularly, especially those in day/temporary personnel, reducing certain biased data. To get the proportional sample sizes of internet service providers organization equally the Billingsley (2013) of unknown sampling, without the real total population has the formula: $n = \frac{Z^2pq.}{E^2}$, p = population value of probability (0.50), q = estimation value of non-interest (1-p), E = error accepted estimation (0.05 or 5%), Z = standard value of validity level (95% = 1.96) then $n = \frac{(1.96)^2(0.50)(0.05)}{(0.05)^2}$ = 384.16 ≈ 384.

The selected sample used a multistage sampling technique (Cochran, 2007) and followed the first step, probability sampling, through stratified random sampling to classify the sampling of technological organizations that provide internet broadband AIS, DTAC, TRUE, and 3BB. The second step, non-probability sampling, is the selected sampling method of quota sampling. At this stage, 96 staff personnel were selected from each organization. The final stage is the convenient sampling technique used to collect data from the voluntary personnel filling in questionnaires. Hence, the designated sample size of 384 personnel is required (4 digital providers organizations, each of 96 personnel = 384 personnel).

The structure and research tools qualification were measured on the questionnaire in line with academic performance and content validity, using IOC (Item Objective Congruence Index) with each question on the objectives (Ekka, 2014) from 5 experts, which was a standard opinionated measurement (Rovinelli & Hambleton, 1977). The results indicated that the quality measurement of a research questionnaire had content validity on IOC between 0.60-1.00 and passed 0.50 above all questions in the questionnaires. If the statistics value is greater than 1, use a leading 0, if the statistic cannot be greater than 1, do not use a leading, e.g., p<.045.

The checklist was in part of a questionnaire on respondents, profiles, and the second part in the search for excellence of leading digital innovation marketing management organization into the Metaverse. In the organization's structure, a system of value, style, staff, skill, strategy, and the share of value applying pairwise comparison, where important weights are transformed into numbers 1-9, are used in Table 2.

Table 2 Standard measurement in important weight comparison

Weight Significant Values	Definition	Explanation
1	Equal significance	Pairwise consideration for comparison has equal significance.
3	More significance estimated equal significance	Factors for considering comparison has significantly more than one factor at estimation.
5	Apparently significance	Factors for considering comparison have significantly more than other factors apparently.
7	Apparently more significance	Factors for considering comparison have significantly more another factor more obviously than other factors.
9	Apparently real most significance	Maximum factor values significant possibility in considering pairwise comparison.
2, 4, 6, 8	The significance value between medium value as mentioned above	Value significance I factor comparison had considered that should be medium between values as mentioned above.

Source: Defence Technology Institute (2020)

The aftermath takes the weight significant from 1 to 9 for the arithmetic mean calculation, then rounding up the decimal numbers into total round-up numbers for analytical evaluation of AHP with the software package, AHP online system (AHP-OS) (Goepel, 2022).

The analysis of data performance in PAWS version 18.0 statistical software and AHP online system (AHP-OS) used different statistical values: frequency distribution, percentage, mean, standard deviation, the Analytical Hierarchy Process (AHP).

Results

The personal profile of respondents was analyzed for the 384 samples of staff employees who regularly work in Thailand's leading technological organization. Results showed that most were female (59.4%); had an average age of 30.91 years old; mostly bachelor's degrees (51.8%); mostly worked at an operation position level (63.3%); and had an average job experience span of 6.54 years, as depicted in Table 3.

Table 3 Shows personal employee factors

Personal Factors	Number (Person)	Percentage
Female	228	59.4
Bachelor's degree	199	51.8
Work at the operational level	243	63.3
Personal Profile	$\bar{x}$	**S.D.**
Age	30.91	1.26
Work experience	6.54	0.89

The analysis technique of AHP of indicators or index is as follows: The Consistency Ratio (C.R.) evaluation of reason was the importance of each factor, then factor consistency evaluation was undertaken with pairwise comparison to calculate the eigenvector values that have a causal relationship. Suppose the value C.R. 0.10 (10%) indicated that each factor was related. Hence, an eigenvector can be implemented for weighing value, and if C.R.>0.10 indicates no relation, it needs adaptations to weigh the importance of marketing pairwise once again. The results indicated that the C.R. values were equal to 0.076 and 0.092, respectively. A conclusion could be drawn that the pairwise comparison was in line with a reasonable and acceptable measurement where each weight factor influenced index selection in parallel with an acceptable level. The principal eigenvalue was equal to 7.609 and 22.854, respectively, which was used to discover factor loading later, as depicted in Table 4.

Table 4 Consistency Ratio (C.R.)

Excellence in Innovative Marketing Management	Number of Comparisons	C.R. (%)	Principal Eigenvalue
7 Components	21	7.6	7.609
20 Factors	190	9.2	22.854

The factor loading indicators (>0.30, absolute value) (Kline, 2023) in search of excellence for digital innovation among leading technology organizations into the Metaverse found two crucial matters for the Metaverse opportunity: (1) the component in search of excellence in digital innovation of marketing management indicated that the structure of the organization ranked the most important level (λ = 0.405); staff (λ = 0.205); strategy (λ = 0.196); skill (λ = 0.096); style (λ = 0.043); system of value (λ = 0.028); and

share of value (λ = 0.027) respectively; (2) factor of excellence in digital innovation for marketing management into the Metaverse indicated that sustainable growth was the most important level (λ = 0.128); followed by personnel quality (λ = 0.112); brand strength (λ = 0.110); creative innovation development (λ = 0.085); friendly environment (λ = 0.072); functional potentiality (λ = 0.060); product and level of the target market (λ =0.055). The productivity levels are enough for basic consumer needs (λ = 0.054), as depicted in Table 5, in lines with Figure 3, Figure 4, and Figure 5 respectively.

Table 5 Index of excellence in managing the digital innovation market of Thailand's technology leaders to the Metaverse

Excellence in Innovative Marketing Management	Factor Loading (%)	Rank (No.)
S1 Structure of organization	40.5	1
S1.1 Brand strength	11.0	3
S1.2 Organizational loyalty	5.2	9
S1.3 Value-added products	4.3	11
S2 System of value	2.8	6
S2.1 Environment technology	7.2	5
S2.2 Corporate responsibility/environment	3.1	13
S2.3 Interest in climate issues	1.5	18
S3 Style	4.3	5
S3.1 Function potentiality	6.0	6
S3.2 Tangible product	1.6	17
S3.3 Creative innovation development	8.5	4
S4 Staff	20.5	2
S4.1 Recruit talented	1.1	20
S4.2 Human development training	11.2	2
S4.3 Ability and visionary leadership	1.2	19
S5 Skill	9.6	4
S5.1 Crafting variety of products and services	2.2	14
S5.2 Handing material and equipment readiness	2.0	16
S5.3 Honest service provider behavior	3.3	12

Table 5 Index of excellence in managing the digital innovation market of Thailand's technology leaders to the Metaverse (con.)

Excellence in Innovative Marketing Management	Factor Loading (%)	Rank (No.)
S6 Strategy	19.6	3
S6.1 Profit capability	4.6	10
S6.2 Growth sustainability	12.8	1
S6.3 Integrated market management	2.1	15
S7 Share of value	2.7	7
S7.1 Product and target market level	5.5	7
S7.2 Productivity designed level	5.4	8

Note: Factor loading (λ) in the form of a percentage (%)

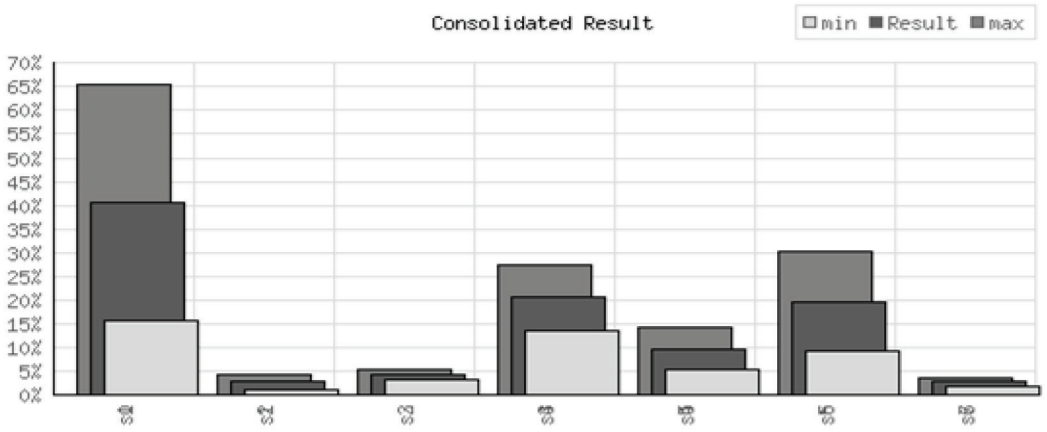


Figure 3 Component consolidated result of marketing management excellence digital innovation.

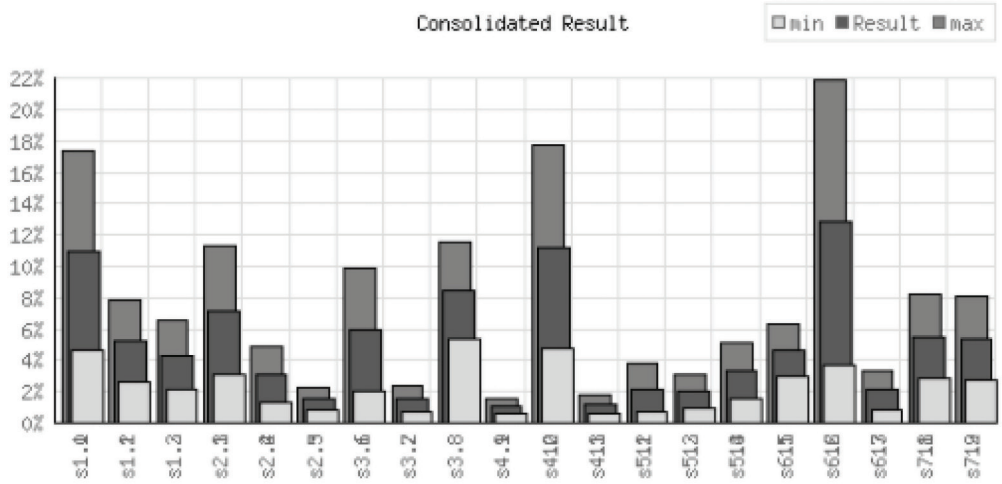


Figure 4 Graphic illustration consolidated result of factor loading of component and factors of marketing management of digital innovation among leading technology organizations into the Metaverse.

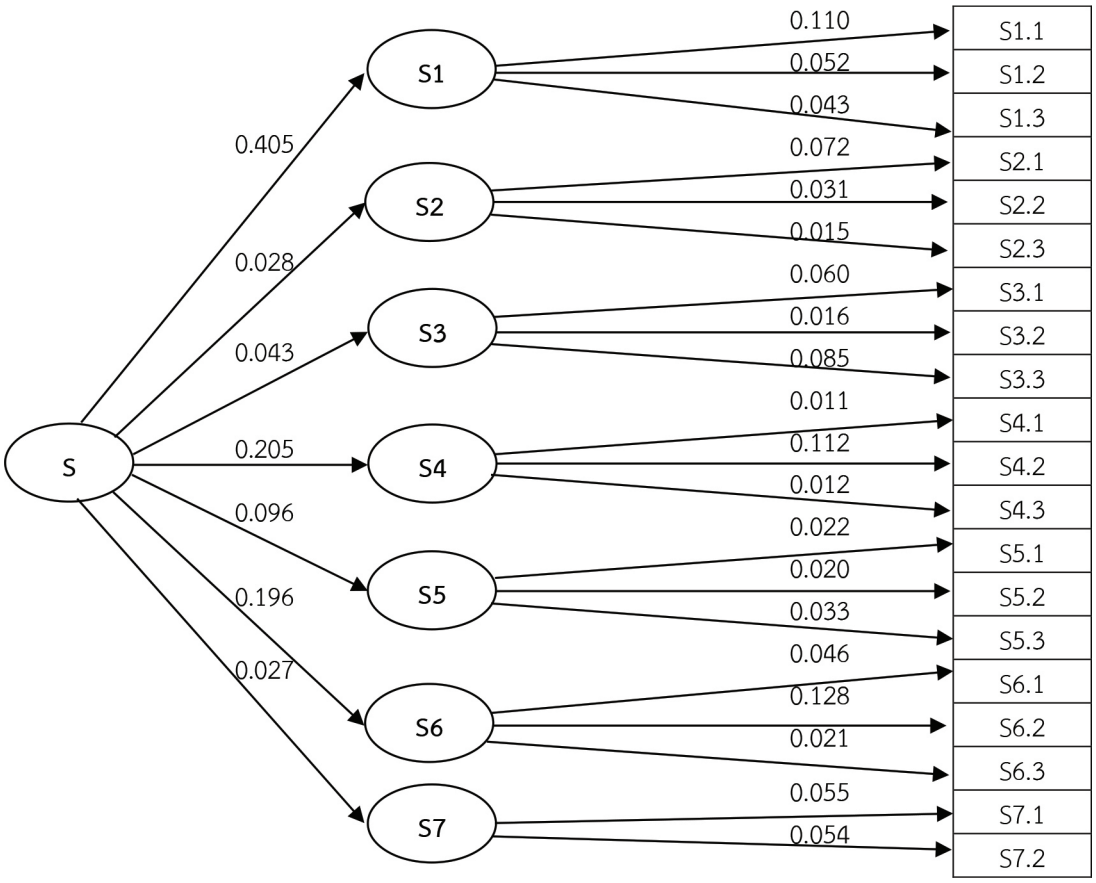


Figure 5 Results of AHP for marketing management in digital innovation among leading technology organization into metaverse

Note: Factor loading (λ) in the form of a percentage (%) into 3 decimal points

The hypothetical solutions' results were based on the questionable hypothesis: "The indication of marketing management excellence in digital innovation among Thailand's leading organizations into the Metaverse appealing five top crucial ranks". Structure of organization (λ = 0.405); staff (λ = 0.205); strategy (λ = 0.196); skill (λ = 0.096); style (λ = 0.043) respectively. Then it considered each excellence factor in digital innovation marketing management, conclusive results indicated that the top requirements were growth sustainability (λ = 0.128); human development training (λ = 0.112); brand strength (λ = 0.110); creative innovation development (λ = 0.085); environment technology (λ = 0.072), respectively.

Discussion

In Peters and Waterman (2015) study, it appeared that the successful operations of any organization's effectiveness depend on variable factors that have a continuously connected relationship with at least 7 variables. Hence, Thailand's leading technology organization could create the managerial groundwork for operations, including linking-pin support factors on digital innovation

concepts of the Metaverse community provision. This marketing management can be distinguished between hardware and software.

Hardware is composed of the organization structure and should be flexible in new idea generation and on-time decision making (Gola, 2020). Business and marketing strategies support value creation through an innovation policy of value-added innovation. The digital innovation organization must respond to customers' problems with creative solutions by tracking back complex data of slow and stop functioning internet systems or any types of internet difficulties where organizations can bring forth new product ideas (Laksitamas et al., 2021). In the case of the system of value factors that encourage new creative ideas among employees, it will lead to the feedback of information. A new creative idea question for innovating value-added policy and strategy (Mononen, 2021).

Given Software is the composition of style in collaboration and participation for sustainability, it must emphasize teamwork and innovative creation. Relation also sets up an excellent image for employees' good practices (Channon & Caldart, 2015). As a result of the staff recruitment and selection process, new employees should have a positive attitude and understand teamwork. Internet communication is open to every management level for organizational strength and career path discussion for personal growth, given that every employee should share value through collaboration. Effective communication between internal and external organizations depends on a positive spirit, energy, and sharing. These are crucial factors for organization development for value-added innovation distinctively. The cultural and social values would reveal daily operations best practices for young employees with some experience. The executives must recognize the indisputable fact that 'We are digital innovators, and digital innovation technologists", meaning under the technology and I.T. combination for customers' needs and wants to become a skill-focused specialization (Abbasimehr & Shabani, 2021). Hence, Soft factors align with Thailand's digital innovation organizations except for the share of value factor, which needs time to be absorbed and embedded within organizations. Nonetheless, the concept of beyond-thinking design will be a good strategic position for the Metaverse. Users relationship through social engagement and commitment.

Conclusion

Searching for the analytic hierarchy process of the marketing management indicators in digital innovation organizations into the Metaverse new challenges for future marketing opportunities. Index of excellence in managing the digital innovation Thailand's market top 3 factors' value were results were: structure of the organization, staff and strategy through PAWS and AHP analysis. The excellence factor in digital innovation marketing management results is growth sustainability, human development training, brand strength, creative innovation development and technology. Metaverse transformation and the

coexistence of the real world and the virtual world. Through connection and convergence. The Mataverse will have tremendous effects on marketing thriving in an increasingly competitive business.

Recommendations

Leading digital innovation technology service providers could concentrate on excellent business and marketing performances into Metaverse sustainability, advantages on tangible and intangible resources under Peters and Waterman (2015) in search of excellence, 7's, including research development skills, copied rights knowledge management, certification and patent trademarks. All these sustainable innovation policies would support organizations' efficiency and effectiveness.

There is needed training on marketing process sales volume creation, creative innovation, and invention. The employee's capability and potential readiness for each level of job responsibility, both theory and practice. An organizational support program is set for morality and motivation due to economic incentives. The in-depth consumers' data for segmental sales strategy include upholding network alliances. Considering excellent marketing management results would lead technology organizations to be ready for adaptability, flexibility, and agile performance. They can begin by applying the 7's results for organization evaluation to gain present veracity, then move to reengineering through the style of executives to visualize the digital technology creation in line with review and structural organization adaptation. Focusing on participation will facilitate sustainable organizations through two-way communication for change. Feedback of information responses for exchange of ideas restoring such employees can search and interact with knowledge-based information deeply and embedded innovated enlightenment leading into the Metaverse transition.

Thailand's government, units, and private enterprises should compel deep knowledge skills and ability under international ethics standards of the profession through successful signature certification. The universal acceptability and service provided for any new type of internet launch should be stamped for customer security, validity, and reliability. Future research should focus on the causal relationship factors impacting digital advances in the Metaverse reality through the structural equation mode of searching for excellence in marketing management of technology appropriately.

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