Selection of a Sustainable Strategy Using DSS for Students in Selecting the Faculty of Economics and Business with the Topsis Method

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Article Information

Abstract

Universities must be able to predict opportunities and challenges with the right interest in the student's choosing majors in higher education in the digitalization era. This study provides the right strategy for FEB UDINUS by proposing a structural hierarchical model to analyze changes in student decision-making patterns in choosing the Faculty of Economics and Business at Dian Nuswantoro University in the digital market era by taking the context of sustainable value. The data collection techniques used in-depth interviews to determine student's decision-making criteria in choosing FEB majors. The analysis of decision-making factors was processed using TOPSIS (Technique for Order Preference by Similarity to Ideal Solution). The results of this study show the ranking strategy of the most appropriate ranking such as the strategy to find credible partner, the strategy to provide additional community benefits, the strategy to educate the community, the strategy for building collaboration between students, the strategy for creating iconic brands, the strategy for building collaboration between faculty and students, the strategy for building new learning models, and the strategy for building a new learning culture.

INTRODUCTION

The world of education today is increasingly competitive and is required to produce graduates who are competent and superior and have added value, so they can compete in the world of work. Education becomes absolute requirement and a means to develop students' knowledge and skills. To get the desired output, education must be supported with adequate facilities adapted to the digital era.

The Faculty of Economics and Business (FEB), Dian Nuswantoro University has two study programs of accounting and management and has the post-graduate programs of Master in Management and Doctoral in Management. FEB Dian Nuswantoro University is a faculty that has the second largest interest after the faculty of informatics engineering. The two study programs have produced many of the best graduates who work in government and private institutions. Facing the digitalization era, the faculty of economics continues to flap its wings to face competition by improving the quality of education as seen from the superior accreditation of each study program. Superior accreditation is a selling point so that students have an interest in choosing a study program to study. Students in choosing a study program at FEB UDINUS have different considerations because each student has different perceptions, aspirations, interests, views and talents in analyzing the quality of study programs. The importance of maintaining and improving the quality of study programs in the midst of competition in the world of education is very important for FEB to explore the factors that form the basis for considering students' interest in choosing majors in accounting and management. UDINUS's faculty of economics and business are required to be able to understand consumer behavior, the students in this case, in choosing higher education services.

Universities must have the right strategy that is superior to competing universities. Various methods were carried out, such as placing billboards in strategic places, banners, promotions, and mobilizing the closest people to join FEB UDINUS. The factors that influence consumer behavior are internal factors (personal and psychological factors) and external factors (cultural and social factors)

External factors have a very extreme impact on student interest in choosing majors. Digitalization is changing faster than ever before. and the Internet is becoming a core business need in this era of electronic generation (Abbasi et al., 2011; Fullam, 2017; Tan et al., 2010). Digital platforms are used by marketers to identify their opportunities which assist them in promoting, communicating, and distributing their products to end users (Confos et al., 2016; Shaouf et al., 2017). This gave rise to the exponential growth of the volume of Internet-based purchases simultaneously changing consumer decision-making patterns. Consumers rely on the Internet for their daily needs and even adapt their needs with the help of digital technology (Royle and Laing, 2014). Digitalization changes the mindset of students choosing accounting and management majors to focus more on digital-based curricula. Advances in technology, changes in consumer behavior with their busy schedules, and trust in the e-commerce environment are the driving factors for changes in consumer decision-making patterns (Srinivasan et al., 2016; Wu et al. 2016). This pattern of changing consumer behavior poses a significant challenge for universities to provide services with digital-based accounting and management majors. Furthermore, product ratings and reviews also influence purchasing decisions and consumer shopping behavior (Filieri, 2015; Zhu and Zhang, 2010). In this case, the review of superior accreditation accompanied by the good quality of education and the large number of graduate students majoring in accounting and management who are accepted to work in government agencies and large companies are the factors that attract students' interest in choosing the FEB major.

The pattern of consumer decision-making changes rapidly due to the ease of information being transmitted through online facilities, and, therefore, universities must have a unique way of marketing in formulating strategies in order to have consumer appeal, loyalty and retention. Therefore, in the digital market era, synthesizing information about changing patterns of consumer (student) behavior in choosing economics majors is very important for determining the right tertiary strategy. Therefore, the results of this study help FEB UDINUS to understand and discover the factors that influence the changing pattern of consumers (students) choosing majors in accounting and management. To overcome the

problem of digital market evaluation which includes many qualitative factors as measured by unclear data, this research uses the Topsis approach. The Topsis method assists in the analysis of decision-making factors which calculates the priority weight of the final factors to get the best ranking and proposes a structural hierarchical model of the factors. (Primasari, Wardoyo, Sari, 2018). Structural hierarchical model of factors to predict patterns of changes in consumer decision-making based on sustainable activities. Sustainable value is a sustainable activity that integrates economic, environmental and social values.

Sustainable activities refer to sustainable values that integrate economic, environmental and social values. Economic, social, and environmental dimensions provide a more focused perspective on sustainable value (Evans et al, 2017). Social values relate to aspects of equality and diversity, poverty alleviation, welfare, community development, social behavior, secure livelihoods, labor safety standards, and health. Environmental values can be in the form of energy-efficient consumption, renewable resources, low emissions, waste reduction, biodiversity, and pollution prevention. The economic values are in the form of aspects of profit, rate of return on investment, financial security, long-term viability, and business stability.

There are nine sustainable strategies according to John Grant (2009), i.e. (1) Providing product samples to the community, (2) Looking for credible partners, (3) Finding additional benefits, (4) Educating the community, (5) Building iconic brands, (6) Collaborate with consumers and change their behavior, (7) Building a new culture, (8) Building a new mode, (9) Building collaboration between consumers. This research tried to find out the best strategy out of nine sustainable strategies based on the main factors in student decision making to enter FEB.

Universities need to take into account the factors that influence students choosing study programs at the faculties of economics and business, including internal and external factors. Consumer behavior is influenced by personal, psychological and cultural, social factors (Kotler and Armstrong, 2012). The factors that influence student interest are psychological, personal, social and cultural factors. In the context of consumer behavior, culture is described as values and beliefs, customs that apply in society to regulate consumer behavior. In certain layers of society, the culture of the need for increased knowledge and new experiences that students want has the most extensive influence on students' decisions to choose majors in accounting and management. From social factors, it is explained that the interest of consumers (students) in choosing certain majors is influenced by family, reference groups, roles and status. The results of previous research state that the factors that influence students' interest in majoring in accounting at STIE Perbanas are employment, interest and image factors (Risnawati and Irwandi, 2015). The factors influencing students to choose a study program are career expectations, perceptions, and personal characteristics (Tang and Seng, 2017).

METHOD

The objects of this research were the students of management accounting and accounting in 2021/2022 at the Faculty of Economics and Business, Dian Nuswantoro University. The sampling used purposive sampling with the criteria of (1) the UDINUS FEB undergraduate students; (2) the undergraduate students who chose accounting and management majors for the 2021/2022 batch; (3) the Undergraduate FEB students who used information and tools related to digitalization in majoring in accounting and management. Data collection begins with observation and then continues with in-depth interviews to analyze in more depth the exploratory factors that influence FEB students to choose their majors. After that, it was to determine the criteria for the main factors of decision making by considering sustainable activities. Then, it was the use the Topsis method to find the best ranking alternative weights from the factors of student decision making in choosing a major.

The analysis was carried out using the method of TOPSIS. The analysis of decision-making factors was processed using TOPSIS (Technique for Order Preference by Similarity to Ideal Solution) to get a ranking of each alternative (Primasari, Wardoyo, Sari, 2018). The stages in the TOPSIS algorithm were; (1)

creating a normalized decision matrix, (2) creating a weighted normalized decision matrix, (3) determining the positive ideal solution matrix and negative ideal solution matrix, (4) determining the distance between the values of each alternative and the positive ideal solution matrix and the solution matrix negative ideal, (5) determining the preference value for each alternative. TOPSIS requires a performance rating for each alternative Ai on each criterion Cj normalized, that is

$$r_{ij} = \frac{x_{ij}}{\sqrt{\sum_{i=1}^{m} x_{ij}^2}}$$ (1)

Where:

i = 1,2,3,…m and j = 1,2,3,…m

X_{ij} = basic matrix to be normalized,

Each i shows the row of the matrix, and every j shows the column of each matrix.

The positive ideal solution A+ and the negative ideal solution A- can be determined based on the weight rating.

$$y_{ij} = W_i r_{ij}$$ (2)

$$A^+ = (y_1^+, y_2^+, \ldots, y_n^+);$$

$$A^- = (y_1^-, y_2^-, \ldots, y_n^-);$$

With Criteria

$$y_j^+ = \begin{cases} \max y_{ij}; \\ \min y_{ij}; \end{cases}$$

$$y_j^- = \begin{cases} \max y_{ij}; \\ \min y_{ij}; \end{cases}$$

Where
Yij = weighted ranking matrix
Wi = weight of i-th rank, and rij is the normalized matrix.
i = 1,2,…,m dan j = 1,2,…m
The distance between the alternative Ai and the positive ideal solution is formulated as
D_i^+=√(∑_(j=1)^n 〖(y_i^+-y_ij)^2 〗) (3)
The distance between the alternative Ai and the negative ideal solution is formulated as
D_i^+=√(∑_(j=1)^n 〖(y_i^+-y_ij)^2 〗) (4)
The preference value for each alternative (Vi) is given as
V_i=(D_i^-)/(D_i^-+ D_i^+) (5)

RESULT AND DISCUSSION

This study used a questionnaire survey to collect data. The questionnaires used 25 questions to assess decision making in choosing the Udinus Faculty of Economics and Business (FEB) as a place of study. The list of questions was based on references from Kumar's research (2018). The factor analysis reduced the data to identify factors that explained most of the observed variance of the variables. Before carrying out a factor analysis, it is necessary to carry out tests to meet the general criteria.

The results of the KMO and Barlett tests in Table 1 show that the data of this study fulfilled its adequacy score (0.9), and the Barlett Test tested the correlation of each item which was stated to be significant with 0.00. In Table 2 Communalities can be seen that most of the communality values are more than 0.50 which means that most of the variables can explain the factors. In the Initial Eigenvalues Table (Table 3), there are 5 components that have Eigenvalues of more than 1, so there are 5 new factors formed from the 25 variables analyzed. Factor 1 33.838% variation. Factor 2 is able to explain 41.029% of the variation. Factor 3 was able to explain 46.753% of the variation, Factor 4 was able to explain 51.586% of the variation and Factor 5 was able to explain 56.094% of the variation. So of the five factors formed, it is able to explain 45,456% of the variation, as shown in Tables 3 and 4.

Table 1. KMO dan Barlett's Test

KMO Measure of Sampling Adequacy		.902
Barlett's Test of Sphericity	Approx. Chi-Square	1803.315
	df	300
	Sig.	.000

Table 2. Communalities

	Initial	Extraction
X1 – Advanced in digital and information technology	1.000	.542
X2 – Have excellent study programs	1.000	.628
X3 – Hope for a good future	1.000	.625
X4 – Full fill educational needs	1.000	.446
X5 – Known as the modern faculty	1.000	.574
X6 – Has good facilities	1.000	.441
X7 – Known as an innovative faculty	1.000	.511
X8 – Seeing the success of the alumni	1.000	.561
X9 – Known as a high quality campus	1.000	.577
X10 – Favorite campus	1.000	.547
X11 – Know the faculty for a long time	1.000	.519
X12 – Information is easy to obtain	1.000	.630
X13 – Location saves transportation	1.000	.475
X14 – Smooth registration without any problems	1.000	.587
X15 – Good reputation	1.000	.687
X16 – Famed faculty	1.000	.547
X17 – Have more confidence	1.000	.638
X18 – Competent teacher	1.000	.520
X19 – Weighing competitors' offerings	1.000	.443
X20 – There is technopreneurship	1.000	.549
X21 – Affordable cost	1.000	.709
X22 – Unaffected by other competitors	1.000	.723
X23 – Friend referrals	1.000	.530
X24 – Gives a good influence to society	1.000	.563
X25 – High confidence	1.000	.452

Table 3. Total Variance Explained by Extraction Sums of Square Loadings

Factor	Extraction Sums of Square Loadings			
	Initial Eigenvalues Cumulative %	Total	% of Variance	Cumulative %
1	33.838	7.930	31.720	31.720
2	41.029	1.211	4.843	36.563
3	46.753	.784	3.138	39.701
4	51.586	.837	3.349	43.050
5	56.094	.602	2.406	45.456

Extraction Method: Principal Component Analysis

Table 4. Total Variance Explained by Rotation Sums of Squared Loadings

Faktor	Rotation sums of square loading		
	Total	% of Variance	Cumulative %
1	3.915	15.661	15.661
2	2.893	11.572	27.233
3	1.714	6.857	34.091
4	1.682	6.726	40.817
5	1.160	4.639	45.456

Extraction Method: Principal Component Analysis

Table 5. Rotated Factor Matrix

	Factor				
	1	2	3	4	5
X2	.670				
X3	.631				
X5	.600				
X1	.589				
X9	.525				
X8	.525				
X7	.514				
X4	.476				
X10	.436				
X6					
X25					
X15		.723			
X17		.618			
X16		.584			
X24		.500			
X14		.464	.429		
X18	.429	.431			
X12			.768		
X11					
X13					
X22				.761	
X21				.709	
X23					.465
X19					
X20					

Table 5 shows that the factors formed from 25 indicators are a total of 5 factors. Loading factor > 0.4 is stated to be valid because the number of samples is up to 200 (Hair et al., 2010) so that it increasingly plays a role in the factors to be measured. Furthermore, the factors formed from these groupings are named with the names of the new factors. These five factors are described. These variables tend to lead to the advantages possessed by the faculty and their competencies. Keywords that are dominant in this group are advanced technology, superior, future, contemporary, innovative, quality, favorite, and competent resources of FEB Udinus. Therefore, Factor 1 is named the Factor of Excellence and Competence. The formation of groups in Factor 2 has dominant keywords in reputation, good name, well-known, trust, smoothness of registration, influence on society to FEB Udinus, so this 2nd factor is named Reputation Factor. The dominant keywords are information and fluency in the registration process for new FEB Udinus students, so this 3rd factor is named the Ease of Information Factor. Prospective new students consider the cost factor and other campuses before entering FEB Udinus. Prospective students will seek information about FEB Udinus' competitor campuses so that they have other choices or alternatives. So, this is a factor that forms the group in Factor 4. which can be named the Cost Factor. The factor groups contain indicators of peer influence as a reference. The influence of friends is the main reference in the formation of this group of factors, hence the name Reference Factors.

The results of the exploratory factor analysis are used as criterion data, while the alternative data used is a sustainable strategy that refers to John Grant's (2009) adjusted research, namely (1) Providing examples of superior products to the community, (2) seeking credible partners, (3) provide additional benefits to the community, (4) educate the public, (5) create iconic brands, (6) build a new learning culture, (7) build new learning models, (8) build collaborations between faculties with students, (9) build collaboration between students. This criterion data and alternative data will be calculated using the TOPSIS method to determine the most suitable strategy used by FEB Udinus, taking into account excellence, reputation, ease of information, costs, and references.

The opinion of several experts is needed here to give the criterion weight to the criterion data. Experts enter a score between 1 and 7 with 7 as Very Important. The preference weight for each criterion

can be seen in Table 6, alternative values for the criteria are obtained from the scores filled in by experts. Next, determine the Normalized Decision Matrix.

Table 6. Alternative Value

Alternatif	Criteria				
	C1	C2	C3	C4	C5
A1	6	6	5	6	5
A2	7	6	5	5	6
A3	6	6	5	5	6
A4	6	6	5	5	6
A5	6	6	5	5	5
A6	5	5	5	4	5
A7	6	6	4	4	5
A8	6	5	5	4	5
A9	6	6	5	5	6

The value of each criterion and alternative was added up and then the value of each criterion was divided by the total number of criteria to get the results of the Normalized Decision Matrix as follows:

$$
N = \begin{bmatrix}
0,3323 & 0,3453 & 0,3402 & 0,4150 & 0,3049 \\
0,3877 & 0,3453 & 0,3402 & 0,3459 & 0,3658 \\
0,3323 & 0,3453 & 0,3402 & 0,3459 & 0,3658 \\
0,3323 & 0,3453 & 0,3402 & 0,3459 & 0,3658 \\
0,3323 & 0,3453 & 0,3402 & 0,3459 & 0,3049 \\
0,2769 & 0,2877 & 0,3402 & 0,2767 & 0,3049 \\
0,3323 & 0,3453 & 0,2722 & 0,2767 & 0,3049 \\
0,3323 & 0,2877 & 0,3402 & 0,2767 & 0,3049 \\
0,3323 & 0,3453 & 0,3402 & 0,3459 & 0,3658
\end{bmatrix}
$$

Furthermore, the result of multiplying the R matrix with the preference weight show the results as follows:

$$
W = \begin{bmatrix}
1,6615 & 1,3810 & 1,3608 & 1,2451 & 0,9146 \\
1,9385 & 1,3810 & 1,3608 & 1,0376 & 1,0975 \\
1,6615 & 1,3810 & 1,3608 & 1,0376 & 1,0975 \\
1,6615 & 1,3810 & 1,3608 & 1,0376 & 1,0975 \\
1,6615 & 1,3810 & 1,3608 & 1,0376 & 0,9146 \\
1,3846 & 1,1509 & 1,3608 & 0,8301 & 0,9146 \\
1,6615 & 1,3810 & 1,0887 & 0,8301 & 0,9146 \\
1,6615 & 1,1509 & 1,3608 & 0,8301 & 0,9146 \\
1,6615 & 1,3810 & 1,3608 & 1,0376 & 1,0975
\end{bmatrix}
$$

And the final step was to determine the Alternative Relative Closeness Value to the Ideal Solution, the results of which are shown in strategy in Figure 2. Then these values are ranked to get the greatest value as the most appropriate decision alternative. From Figure 2, after being ranked and sorted from the largest value, the most appropriate strategy is looking for a credible partner which has the greatest value.
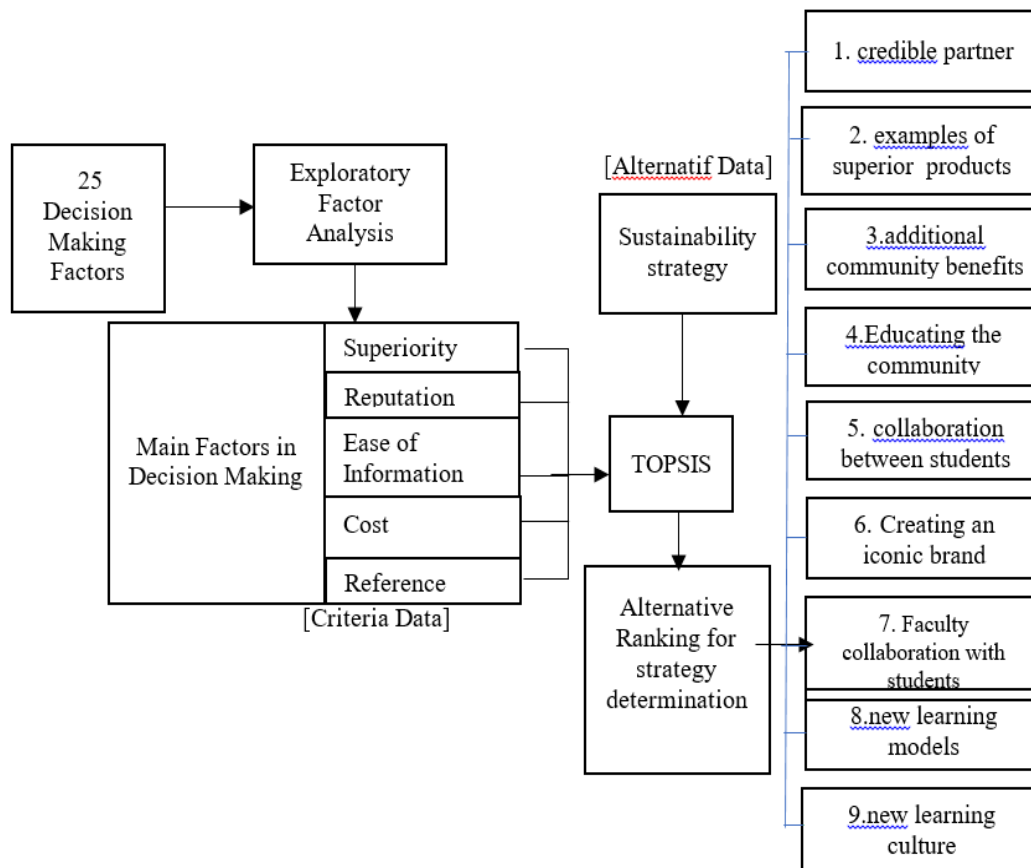
Figure 2. The FEB UDINUS Sustainability Strategy DSS process model

From Figure 2, it can be seen that the strategy that can be taken by FEB Dian Nuswantoro University which is in the highest ranking is Seeking a Credible Partner, meaning that in operational activities FEB UDINUS must hold cooperation partners, namely competent institutions for curriculum development and innovation and application of graduates in the world effort and professionalism. A credible partner can be in the form of collaborating with practitioners in the world of work to fill in the FEB Udinus curriculum, it can also be student internships in the world of work practice, it can also be collaboration with certification bodies to form students ready to practice professionalism with knowledge, it can also be brainstorming collaborations with universities Overseas by increasing student mobility, international webinars, exchange lectures and research collaborations. The second strategy was to give examples of superior products to the community, for example the excellence of UDINUS in Informatics Engineering. Therefore, the students were taught the courses that synergized with Information Technology, for example in accounting there is digital-based Forensic Audit, technopreneur and digital-based marketing for courses in Management.

The third strategy was to provide additional benefits to the community namely sesearching natural dyed batik, making products that are environmentally friendly with the benefit of avoiding harmful chemicals. Go green category products: (1) energy saving, (2) can be recycled, (3) using recycled components (4) do not use hazardous chemicals. And then building the Wisesa Dinkop UMKM application as e-commers for natural color batik products where this application is a place for selling environmentally friendly batik. Also building a special simple bookkeeping application that suits the needs of MSMEs

The fourth strategy was educating the communit. The results of the implications of research and grants from FEB UDINUS lecturers are educating batik artisans to use natural dyed batik. Educating the public through digital or fintech. Another example is introducing low cholesterol foodstuffs that support

a healthy lifestyle. The fifth strategy was to build collaboration between students. UPT Entrepreneurship, the P2MW event entrepreneurship team makes products involving cross-faculties in making products that are popular with the community and are trending, fintech, digital products and commercial products that sell well in the community besides services. For example, making donuts from gadung (tubers) with the advantage of being low in cholesterol, because there was collaboration with the faculty of health. There was research collaboration between students and across universities.

The sixth strategy was creating the Ekonik brand, for example building an iconic brand that has an environmentally friendly theme, empowering food that supports a healthy lifestyle with the Segudang Gadung Donuts brand. The seventh strategy was to build collaboration between faculty and students in the forms of writing joint journal articles between lecturers and students, community service, grants, and seminar committees. The eighth strategy was to build new learning models, for example using a long-distance hybrid learning system with foreign countries and between universities, and Field work practices that provide education in the world of work according to the field they have, E billing, E-government, E-tax. The ninth strategy was to build a new learning culture. For example, hybrid learning was cultivated in every subject. The capital market course was continued with online stock market practice. In entrepreneurship courses, it was by making real businesses, for example, making a segudang gadung outlets.

CONCLUSSION AND RECOMMENDATION

After being ranked and sorted from the largest value, the most important strategy occupies the largest order, that is, the most suitable strategy is to find a credible partner who has the greatest value. It is time for FEB UDINUS to become a university that always excels in flapping its wings in partnership with the business world, practitioners from the world of work and certification bodies, as well as collaboration with institutions related to SOEs and private companies and also collaboration with foreign companies and universities. Therefore, it creates a superior academic climate, ready for the world of work and ready to compete in the international world.

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