Assessing Usage Intention of Financial Shared Services Centers in Commercial Banks: A New Hybrid MCDM Method

Han-Long Chen [1,2,*], *Chuan Lee* [2], *Chin-Tsai Lin* [2]
[1] School of Finance and Accounting, Fuzhou University of International Studies and Trade, Fuzhou, Fujian, 350202, China
[2] Department of Business Administration, Ming Chuan University, 5F, No. 130, Jihe Road, Taipei City 11163, Taiwan

Keywords	Abstract
Commercial Banks, FSSC, ISSM, Hybrid MCDM	The Financial Shared Services Center (FSSC) is the latest application of information systems in the financial domain. Evaluating the choice of FSSC is crucial for commercial banks, but scant academic attention has been paid to this topic. Therefore, this research examines the key determinants affecting the selection of FSSC in commercial banks. It adopts the ISSM and cost to construct a new comprehensive evaluation model for FSSC, which consists of four dimensions and fourteen criteria. This study uses DEMATEL to derive the weights of the dimensions and criteria and applies EDAS to rank the FSSC system candidates. Three real cases of FSSC alternatives validate the paper, and the results show that the model has good applicability and reasonableness, in which the cost dimension is especially necessary. This study extends ISSM's application to FSSC systems while offering policy insights for commercial banks and development benchmarks for platform optimization.

1. Introduction

The Financial Shared Services Center (FSSC) is a new centralized and standardized financial management model implemented by large enterprise groups in recent years. FSSC helps to achieve optimal allocation of resources, improve the management level, and enhance the competitiveness of enterprises. It is widely valued and promoted by the banking industry and has become an emerging and fast-developing field of research (Strikwerda, 2014; Su, 2019).

FSSC is a key element and platform for the maintenance of financial shared services. It can achieve real-time sharing and efficient use of financial information by integrating financial resources and optimizing business processes (Campbell & Strikwerda, 2013) and provide commercial banks with more efficient and transparent financial management tools (Su, 2019;

*corresponding author. Email: chenhanlong@fzfu.edu.cn

Hossein et al., 2018), The platform consists of multiple systems. Choosing the right information system based on its business development and needs is important for commercial banks.

However, despite the widespread recognition of the value of FSSC construction within the industry, commercial banks still face a critical decision-making challenge in practice: how to scientifically select the most suitable FSSC system from multiple available technical solutions? This decision-making process is inherently complex and multi-criteria in nature, requiring a systematic identification of key determinants. Nevertheless, existing research has yet to provide a targeted and satisfactory decision-making evaluation model. Therefore, an in-depth investigation into this issue is warranted.

Understanding the key determinants affecting the adoption of FSSC provides a comprehensive and valuable reference for commercial banks. However, the literature on FSSC mainly focuses on operation models, organizational structures, business processes, etc., and research on the factors influencing its adoption is lagging and has mixed views (Niehaves & Krause, 2010). From the users' perspective, there has been no proper investigation and comprehensive evaluation of the key factors affecting such adoption in commercial banks, which to a certain extent restricts further application and optimization for FSSC. Through a comprehensive literature review, this study synthesizes the differences between previous research and the present work (Table 1), and aims to fill these gaps in the literature by presenting a framework for systematically describing the critical factors affecting FSSC adoption for commercial banks (Ali & Salem, 2020).

FSSC is an information management system (Koohathongsumrit & Luangpaiboon, 2022), and ISSM has been widely applied in the literature on adoption of information systems. The model not only considers the system's technical performance, information quality, and service quality dimensions, but also sets up a comprehensive evaluation model with four dimensions and fourteen criteria. The selection of evaluation criteria must reflect the main concerns of the decision maker (Ma et al., 2023), but ISSM does not include costs. This study constructs a comprehensive evaluation model with four dimensions and fourteen criteria based on modified ISSM (DeLone & McLean, 1992; DeLone & McLean, 2003; Petter et al., 2008) and introduces a cost dimension. It gives a more comprehensive evaluation of the economic benefits of FSSC and provides a more scientific basis for decision-making in commercial banks.

FSSC adoption is essentially a multi-criteria decision making (MCDM) problem (Gupta & Kumar, 2022; Hsu et al., 2024), and this study proposes a hybrid MCDM approach based on DEMATEL (Karuppiah et al., 2022; Agrawal et al., 2022; Zhu et al., 2022) and EDAS (Djimesah et al., 2025; Kahraman et al., 2017). First, DEMATEL can identify causal relationships among influences and measure their importance accurately (Lu et al., 2024; Hsu et al., 2017); Second, as a new type of MCDM, due to its simplicity and fast computation (Torkayesh et al., 2023), EDAS has also been proposed and applied in many fields (Karatop et al., 2021). It can rank the candidates and determine the best preference. Finally, the applicability and validity of the model are verified through real cases.

This study sets up a new FSSC evaluation model and uses DEMATEL and EDAS to evaluate FSSC. It aims to achieve the following 2 research objectives.

(1) Understand the key dimensions, criteria, and weights that affect FSSC adoption.

(2) Develop an FSSC evaluation model to provide a reference for commercial banks to formulate policies on FSSC adoption and to provide system developers with suggestions on system optimization.

The rest of this paper runs as follows. Section 2 reviews the FSSC literature and summarizes FSSC impact factors. Section 3 describes the proposed FSSC evaluation framework through DEMATEL and EDAS methods. Section 4 presents the empirical findings and managerial implications through a case study. Finally, conclusions and perspectives for future research are discussed.

Table 1. *A Comparison between This Study and Previous Ones*

Comparative Dimension	Previous Studies	This Study
1.Research Focus	Primarily concentrated on areas such as the FSSC concept, operational models, organizational structure, and business processes, lacking a systematic investigation into the critical factors affecting FSSC adoption.	Systematically investigates the critical factors affecting FSSC adoption, with a specific focus on the commercial banking industry.
2.Evaluation Framework	Paid limited attention to the construction of decision-making evaluation models for FSSC selection, with a notable scarcity of related research.	Develops an innovative FSSC decision-making evaluation framework based on a multi-dimensional, integrated perspective.
3.Theoretical Model	Despite FSSC being an information management system, prior research has not effectively integrated mature information system theories (e.g., ISSM) with the specific context of FSSC.	Effectively integrates the ISSM with the specific context of FSSC, thereby extending the application scope of ISSM.
4.Research Methodology	No application of Multi-Criteria Decision-Making (MCDM) methods was found in FSSC research, particularly for the commercial banking sector.	Proposes and applies a new hybrid MCDM methodology to FSSC research. This hybrid approach integrates the DEMATEL and EDAS methods.

2. Literature Review

2.1. FSSC

FSSC is a new type of information system applied in the financial management field in recent years (Cao et al., 2021; Su, 2019; Jia, 2020). It is highly valued by commercial banks, because of its adaptability to the management needs of large-scale enterprise groups. In an increasingly competitive market environment, the evaluation of FSSC adoption is very important for commercial banks, as well as the improvement of management level and competitiveness. The essence of constructing evaluation criteria is to identify the key determinants affecting FSSC adoption. Based on different perspectives, scholars have extensively explored the factors affecting FSSC maintenance under different views (Strikwerda, 2014; Philipp &Rolf, 2017).

Most scholars target the main factors affecting FSSC maintenance, such as process integration, performance management, strategic planning, and information technology and systems (Guo et al., 2024; Rohith, 2013; He & Zhou, 2013; Wang, 2023), arguing that each one directly determines the efficiency of a firm's establishment of FSSC. Grant (1999) summarized the factors leading to FSSC adoption into five key aspects: environment, personnel, the methodology of Business Process Reengineering (BPR) adoption, information technology, and the vision for change. Within this context, robust information technology and systems are widely regarded as a critical factor for FSSC maintenance (Marijin & Antonjoha, 2008), while information security and reliability also have a significant impact on FSSC (Damenu & Beaumont, 2017). Ou et al. posit that factors such as relative advantage, compatibility, centralization, formalization, and competitive pressure can also influence FSSC adoption (Ou et al., 2025).Niehaves & Krause (2010) provide a clearer definition of the factors affecting FSSC adoption, grouped into four main categories: cost pressure, leader support, unit cooperation and communication, and organizational power structure. In addition to empirical evidence, empirical research by Goth et al. confirmed that FSSC adoption leads to long-term cost savings, underscoring cost as a critical factor influencing FSSC adoption (Goth et al., 2025).

The above related works demonstrate that despite research efforts, there lacks a comprehensive theoretical framework that adequately describes adoption intention in an inclusive manner. Furthermore, there are scant papers in the literature presenting the conduct of commercial banks in relation to FSSC. This present study fills this gap in the literature.

2.2. ISSM

Among studies on the adoption of information management systems (Watjatrakul & Vatanapitukpong, 2025), the Information System Success Model (ISSM) framework has been widely used and widely recognized as the most classic model for evaluating them. ISSM is frequently cited in the literature as measuring the success of information systems (Lu et al., 2024; Mohammed & Ju, 2019). Eleven years after ISSM was first proposed, DeLone & McLean (2003) refine the original model and propose the modified ISSM. The modified ISSM contains three main dimensions, system quality, information quality, and service quality, that affect the willingness to use and the satisfaction toward information systems.

Researchers have successfully used ISSM to understand the key determinants affecting the selection and use of new information systems (Yovita et al., 2020; Tarwoto & Kuncoro, 2019; Rahayu, Aprilianto & Putro, 2018). Since FSSC is essentially an information management system, this study also includes system quality, information quality, and service quality as evaluation dimensions to construct a hierarchy for evaluating FSSC adoption of FSSC (Lu et al., 2024; Yovita et al., 2020; Mohammed & Ju, 2019).

ISSM has faced criticism for its lack of specificity. The application of this method may lead to inconsistent results, because there is no prospective explanatory variables that are relevant to a specific context (Al-Qaysi et al., 2020; Rizal et al., 2018). Consequently, numerous modifications and expansions of the model, including the incorporation of supplementary exploratory variables, have been suggested for various situations.

Table 2. *Factors Influencing FSSC Adoption by Commercial Banks*

Dimension	Criterion	References
System Quality (S)	Reliability (S_1)	Prybutok et al. (2008); Al-Hattami (2021); DeLone & McLean (2016)
	Suitability (S_2)	DeLone & McLean (2003); Prybutok et al. (2008); Al-Hattami (2021)
	Ease of Use (S_3)	Kumarahadi et al. (2020); Prybutok et al. (2008); Al-Hattami (2021); DeLone & McLean (2016)
	Security (S_4)	DeLone & McLean (2003); Graf (2002); Ozkan & Koseler (2009)
Information Quality (I)	Accuracy (I_1)	Ramayah et al. (2010); DeLone & McLean (2016); Tam & Oliveira (2017); Al-Hattami (2021)
	Relevance (I_2)	Ramayah et al. (2010); DeLone & McLean (2016); Tam & Oliveira (2017); Kumarahadi et al. (2020); Al-Hattami (2021)
	Understandability (I_3)	DeLone & McLean (2016); Tam & Oliveira (2017); Kumarahadi et al. (2020)
Service Quality (E)	Immediacy (E_1)	Kumarahadi et al. (2020); Gorla et al. (2010); Urbach et al. (2010); Al-Hattami (2021); Tam & Oliveira (2017); DeLone & McLean (2016)
	Assurance (E_2)	DeLone & McLean (2003); Gorla et al. (2010); Urbach et al. (2010); Al-Hattami (2021)
	Practicality (E_3)	DeLone & McLean (2003); Kumarahadi et al. (2020)
	Technicality (E_4)	Gorla et al. (2010); Urbach et al. (2010); Al-Hattami & HM (2021); Tam & Oliveira (2017); DeLone & McLean (2016)
Cost (C)	System Cost (C_1)	Jayave et al. (2007); Yadav &Kapoor (2024); Orman (1994); Lederer & Prasad (1993)
	Maintenance Cost (C_2)	Jayavel et al. (2007); Yadav &Kapoor (2024); Orman (1994); Li et al. (2022)
	Operation Cost (C_3)	Jayavel et al. (2007); Yadav &Kapoor (2024); Orman (1994); Burns et al. (2015)

The important driving force behind the emergence of FSSC is that routine, repetitive accounting operations create substantial economic and opportunity costs, creating a high-cost situation (Wang, 2023). Adopting FSSC itself requires high costs that need to be weighed by banks on whether or not to adopt it. Studies also support that cost is an important dimension to be considered in FSSC evaluation (Albashabsheh et al., 2018; Hernandez-Ortega et al., 2017). Therefore, this study argues that there is a need to include cost factors in any evaluation using FSSC (Balana, Vinten & Slee, 2011).

Based on the above analyses, we identify system quality, information quality, service quality, and cost as impact dimensions to explain FSSC adoption by commercial banks. Table 2 describes the 14 criteria within the framework of the proposed 4 dimensions.

2.3. Evaluation methodology for FSSC

FSSC adoption is a complex MCDM problem involving a series of causal relationships among factors and alternatives. The development of MCDM problems has been facilitated by the application of various decision-making techniques. Decision-making techniques like DEMATEL, EDAS, etc. have been used in various evaluation problems (Ma et al., 2023). DEMATEL is an MCDM technique that is a practical and useful tool compared to other methods (Agrawal et al., 2022). It takes into account possible complex causal relationships between factors and visualizes the structure of the relationships, thus facilitating improved decision making (Lin et al., 2018).

DEMATEL only requires data collection from a limited number of respondents, giving advantages of savings in time and manpower (Lu et al., 2024; Hsu & Yeh, 2018). As a result, scholars have widely applied DEMATEL to the evaluation of information management systems with encouraging results (Özdemirci et al., 2023; Chen, 2021). However, to the best of our knowledge, it so far has not been applied to the evaluation of FSSC adoption.

The average distance evaluation method (EDAS) by Keshavarz Ghorabaee et al. (2015) is also a newly developed MCDM (Lu, Yeh & Liau, 2022), which has the advantages of simplicity and less computational effort (Karatop et al., 2021). It also has good consistency and high accuracy under different weights and demonstrates strong performance in efficiently ranking alternatives. Other studies have shown that compared with TOPSIS and GRA, EDAS is simpler and more convenient to operate and has a stronger ability to distinguish between advantages and disadvantages (Ma et al., 2023), but it has not yet been used in the evaluation of FSSC adoption. Based on the successful application of EDAS technology in many areas (Karatop et al., 2021), this study uses it for the evaluation of alternative solutions. In other words, this study uses a combination of DEMATEL and EDAS to evaluate the adoption of FSSC systems.

This study fills the gap in the literature on the evaluation of FSSC adoption. Through the above literature review, it proposes a hybrid evaluation model based on ISSM and cost using hybrid DEMATEL with EDAS techniques. The proposed model and methodology have not been used in other studies on FSSC adoption. First, this study identifies the key dimensions and criteria affecting adoption through ISSM and CEA. Second, it uses DEMATEL to determine the weights of the influential dimensions and criteria. Finally, it applies EDAS to prioritize the FSSC alternatives and to verify the reasonableness and effectiveness of the proposed methodology through examples.

3. Methodology

To understand and analyze the determinants that influence FSSC adoption by commercial banks, we apply a hybrid method of DEMATEL and EDAS (Li et al., 2022). The DEMATEL approach enables us to get the weights of the factors and their interdependencies. Subsequently, we utilize the EDAS methodology to derive the rankings of the various choices for FSSC alternatives. We show these methods in the following subsections.

3.1. DEMATEL method

Decision Making and Trial Evaluation Laboratory (DEMATEL) is a methodology developed at the Barthel Memorial Institute in Geneva from 1972 to 1976 by Gabus and Fontela

(1972). The methodology relies on graph theory and matrix tools to analyze system elements. It is extensively utilized to address intricate and challenging real-world situations (Li et al., 2020; Jafari-Sadeghi et al., 2022). The application of DEMATEL involves a series of six sequential processes (Khorasane, et al., 2022; Lin et al., 2018).

Step 1: Assess the extent of impact between the influencing factors and examine if there is a direct correlation between them. The numbers 1, 2, 3, 4, and 5 correspond to the levels of influence, ranging from no influence to very strong influence, respectively.

Step 2: Construct the direct-influence matrix, direct-relationship matrix $A = [a_{ij}]_{n \times n}$, and each value a_{ij} in the matrix, which is the magnitude of the influence of factor i on factor j. It is denoted as x_{ij}^k, which is derived from the evaluation performed by the experts. Thus, $x_{ij}^1, x_{ij}^2, \dots, x_{ij}^h$ form the matrix of h experts. From this, the formula for a_{ij} is:

$$a_{ij} = \sum_{k=1}^{h} \frac{x_{ij}^k}{h}, \quad 1 \leq k \leq h \tag{1}$$

Step 3: Calculate the normalized direct-influence matrix D, whose value is between 0 and 1. The normalized matrix D is obtained by dividing the maximum value of the sum of the elements in each row of the matrix by matrix A. The formula is as follows.

$$D = m \times A \tag{2}$$

$$m = min \left[\frac{1}{\max_i \sum_{j=1}^{n} a_{ij}}, \quad \frac{1}{\max_j \sum_{i=1}^{n} a_{ij}} \right] \tag{3}$$

Step 4: Calculate the total direct-influence matrix T. The total direct-influence matrix T is constructed from the obtained normalized direct-influence matrix D. The formula is as follows.

$$T = [t_{ij}]_{n \times n} = \lim_{n \to \infty} （D + D^2 + D^3 + \dots + D^n + \dots） = D(1-D)^{-1} \tag{4}$$

Here, I is the unit matrix.

Step 5: Calculate the association and causality values and obtain the sum R_i and S_j of each row and column of the total direct-influence matrix T, respectively; i.e., the influence and the degree of the factor.

$$R_i = \sum_{j=1}^{n} t_{ij} \quad i=1,2,\dots,n \tag{5}$$

$$S_j = \sum_{i=1}^{n} t_{ij} \quad j=1,2,\dots,n \tag{6}$$

$R_i + S_j$ is the association value; a higher value signifies that the element has a stronger impact on other factors and can be originally considered as a significant component. $R_i - S_j$ is the causality value, which is the degree of causal relationship between factors; if greater than zero, then it is called the cause element; if less than zero, then it is called the result element.

Step 6: Calculate the weight of each factor, normalize the association value $R_i + S_j$, and calculate the factor weight, where the factor weight represents the importance of each factor, and the sum of its normalized weight is 1. The formula is as follows.

$$W_i = \frac{R_i + S_j}{\sum_{i=1}^{n} \sum_{j=1}^{n} (R_i + S_j)} \tag{7}$$

3.2. EDAS method

Keshavarz Ghorabaee et al. (2015) propose the method of Evaluation Based on Distance from Average Solution (EDAS), which has been extended and applied by scholars in many studies (Bartu & Muhammet, 2023; Ghorabaee et al., 2017; Kahraman et al., 2017; Ren & Toniolo, 2018; Zhang et al., 2019). It is an analytical method based on the average distance that relies on the fundamental concept of distance averaging to address multi-attribute decision-making challenges. The methodological steps of the operation are as follows (Karatop et al., 2021; Mitra, 2020).

Step 1: Determine the attributes of the evaluation program.

Step 2: Create a decision matrix X. The formula is as follows.

$$X = \left[X_{ij}\right]_{m \times n} \tag{8}$$

Step 3: Determine the average solution based on all attributes. The method is as follows.

$$AV = \left[AV_j\right]_{1 \times m}, \text{ where } AV_j = \sum_{i=1}^{n} \frac{X_{ij}}{n} \tag{9}$$

Step 4: Calculate the forward distance value (PDA) and the reverse distance value (NDA) of the average solution depending on the attribute type (benefit or cost). The formulae are as follows.

$$PDA = \left[PDA_{ij}\right]_{n \times m} \tag{10}$$

$$NDA = \left[NDA_{ij}\right]_{n \times m} \tag{11}$$

If the attribute of the jth type is a benefit type, then:

$$PDA_{ij} = max \ (0, \ (X_{ij} - AV_j)) \ / \ AV_j \tag{12}$$

$$NDA_{ij} = max \ (0, \ (AV_j - X_{ij})) \ / AV_j \tag{13}$$

If the attribute of the jth type is a cost type, then:

$$PDA_{ij} = max \ (0, \ (AV_j - X_{ij})) \ / \ AV_j \tag{14}$$

$$NDA_{ij} = max \ (0, \ (X_{ij} - AV_j)) \ / \ AV_j \tag{15}$$

Here, PDA_{ij} and NDA_{ij} respectively denote the forward distance value and reverse distance value of the ith solution to the average solution under the jth attribute.

Step 5: Calculate the weighted PDA and NDA for all scenarios. The method is as follows.

$$SP_i = \sum_{j=1}^{m} W_j PDA_{ij} \tag{16}$$

$$SN_i = \sum_{j=1}^{m} W_j NDA_{ij} \tag{17}$$

Step 6: Normalize all SPs and SNs. The method is as follows.

$$NSP_i = \frac{SP_i}{\max_i \ (SP_i)} \tag{18}$$

$$NSN_i = 1 - \frac{SN_i}{\max_i \ (SN_i)} \tag{19}$$

Step 7: Calculate the appraisal scores (AS) for all scenarios. The method is as follows.

$$AS_i = \frac{1}{2}(NSP_i + NSN_i) \ , \ \text{where} \ 0 \le AS_i \le 1 \qquad (20)$$

Step 8: Sort the solutions according to the value of AS_i.

3.3. Proposed approach

The literature has not conducted a thorough inductive investigation of the factors that influence the effective adoption of FSSC. Additionally, studies have not combined the DEMATEL and EDAS methodologies to gain insight into the intention of commercial banks to use FSSC. Figure 1 shows the procedure for applying this hybrid MCDM approach.

In the first stage, we propose key determinants that influence the adoption of FSSC using ISSM and cost as theoretical foundations. The proposed research framework considers four factors: system quality, information quality, service quality, and cost.

In the second stage, the components are examined utilizing DEMATEL to ascertain the causal connections and relative importance among the dimensions and criteria (Baykasoğlu & Gölcük, 2017). Next, the weights are applied to prioritize FSSC using the EDAS methodology. Finally, the feasibility of the proposed methodology is validated by evaluating three FSSC alternatives: network reimbursement, financial accounting, and budget management.
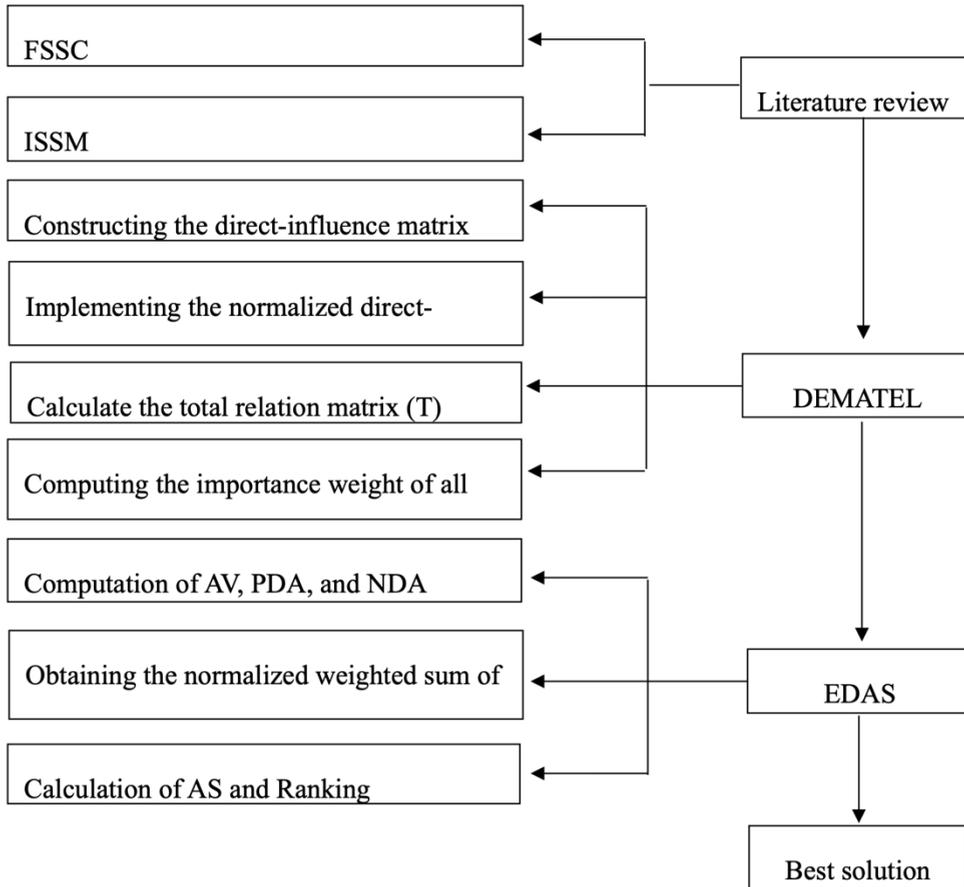

Fig. 1 *Architecture of The Study Design*

4. Results

4.1. Sampling and data collection

This study investigates the key factors affecting FSSC adoption by commercial banks and excludes responses from those with no experience in using FSSC and questionnaires with missing values or those that had repeatedly chosen the same responses for all questions. In total, 33 written survey questionnaires were returned between November 15 and December 25, 2021, by commercial bank practitioners. Five invalid questionnaires were excluded, and 27 valid questionnaires were retained, forming a valid sample rate of 81.8%.

Table 3. *Descriptive Statistics of The Respondents' Characteristics*

Item	Category	Frequency	Percentage (%)
Gender	Male	10	37
	Female	17	6
Age	≤30	7	26
	31-40	16	59
	41-50	3	11
	51-60	1	4
Education level	High school	1	4
	Junior college	4	15
	Bachelor degree	18	67
	Above Master	4	15
Type of personnel	Finance staff	8	30
	IT staff	4	15
	Other users	15	56
Years of experience	≤5	6	22
	5-10	11	41
	11-15	4	15
	16-20	3	11
	21-25	1	4
	≥25	2	7
Type of bank	State-owned commercial bank	23	85
	National joint-stock commercial bank	4	15

The statistics of the valid questionnaire responses indicate that 63% are women and 37% are men; 30%, 15%, and 56% are bank financial personnel, IT personnel, and other users, respectively; and 85% are from state-owned commercial banks. In terms of age, the majority are between 31 and 40 years old, accounting for 59% of responses. In terms of education, the

majority of the sample (67%) are undergraduates. In terms of years of experience in banking, the proportion of those working 5-10 years is larger at 41%. Table 3 presents all the statistical information.

4.2. Application of DEMATEL to determine the evaluation factor weights

In the following section, our empirical study uses DEMATEL to calculate the relative importance of the evaluation factors that affect commercial banks for FSSC adoption. DEMATEL employs a five-level scale to assess each question and to determine the weight of each evaluation component. Subsequently, the weight of each dimension and criterion is computed.

Table 4 displays the initial direct-influence matrix A for each dimension, derived from the respondents' results. The values of a_{ij} in the matrix may be computed using Eq. (1). a_{ij} denotes the magnitude of the influence of factor i on factor j. For example, the average degree of influence of system quality on information quality is determined to be 3.259.

The value 10.371 is the maximum among the sums of the rows and columns. The normalized direct-relation matrix D is derived using Eqs. (2) and (3) appear in Table 5. Therefore, the direct impact of system quality on information quality is precisely 0.314 (=3.259/10.370).

On this basis, the total influence matrix T for each dimension is calculated based on Eq. (4), where the total influence value of system quality on information quality is 3.661. Table 6 shows the results of the calculation.

Table 7 shows the R_i and S_j values of the total influence relationship matrix T for each dimension according to Eqs. (5) and (6), respectively, as well as the correlation (R_i+S_j) and causation (R_i-S_j) values calculated from the R_i and S_j values (Tsai et al., 2020).

Table 4. *Initial Direct-Influence Matrix A of The Dimensions*

	S	I	E	C	Sum
S	0	3.259	3.407	3.296	9.963
I	3.370	0	3.593	3.407	10.370
E	3.259	2.926	0	2.889	9.074
C	3.259	3.000	3.222	0	9.482

Table 5. *Normalized Direct-Influence Matrix D of The Dimensions*

Dimension	S	I	E	C
S	0	0.314	0.329	0.318
I	0.325	0	0.346	0.329
E	0.314	0.282	0	0.279
C	0.314	0.289	0.311	0

Table 6. *Total-Influence Matrix T of The Dimensions*

Dimension	S	I	E	C
S	3.621	3.661	3.959	3.775
I	3.977	3.527	4.083	3.889
E	3.612	3.408	3.458	3.510
C	3.725	3.519	3.811	3.402

Table 7. *Degree of Total Influence Of The Dimensions*

Dimension	R_i	S_j	R_i+S_j	R_i-S_j
S	15.016	14.934	29.950	0.082
I	15.476	14.116	29.592	1.360
E	13.988	15.3120	29.300	-1.324
C	14.457	14.576	29.033	-0.119

Table 8. *Weights of Dimensions and Criteria*

Dimension	Weight	Criterion	Local weight	Global weight	Ranking
S	0.254 (1)	S_1	0.254	0.065	7
		S_2	0.250	0.064	8
		S_3	0.247	0.063	9
		S_4	0.249	0.063	9
I	0.251 (2)	I_1	0.335	0.084	1
		I_2	0.332	0.083	3
		I_3	0.334	0.084	1
E	0.249 (3)	E_1	0.246	0.061	13
		E_2	0.246	0.061	13
		E_3	0.253	0.063	9
		E_4	0.255	0.063	9
C	0.246 (4)	C_1	0.330	0.081	6
		C_2	0.336	0.083	3
		C_3	0.334	0.082	5

After the procedure is similarly applied to the criteria level. Table 8 shows the local and overall weights of all factors that influence the selection of FSSC for commercial banks. They embody the importance of each factor in the adoption decision of FSSC.

For the different dimensions, the highest weight is calculated using DEMATEL for system quality (0.254), followed by information quality (0.251), service quality (0.249), and cost (0.246). For the criteria, the result shows that the highest overall weight is for accuracy (0.0841), followed by understandability (0.084), relevance (0.083), maintenance cost (0.083), operation cost (0.082), system cost (0.081), and reliability (0.065). These top 50% criteria are relatively important for

any FSSC selection and should be prioritized. The two criteria with the lowest weights are assurance (0.061) and timeliness (0.061), which belong to the service quality dimension.

4.3. Ranking of alternatives using EDAS

As in Table 8, after the weights of the factors by DEMATEL that influence intentions are calculated, the next step is to employ EDAS to rank the three FSSC business systems as alternatives. These systems are network reimbursement (A), financial accounting (B), and budget management (C). EDAS requires the respondents to assign a numerical value between 1 and 5 to rate each alternative in relation to each criterion. Table 9 displays the outcomes of the average solution for the various alternatives based on the chosen criteria.

The next step involves determining the positive distance from the average (PDA) and the negative distance from the average (NDA) for each alternative using Eqs. (10) and (11). The obtained results are in Table 10, respectively. Specifically, PDA_{S1} and NDA_{S1} are determined as follows.

$$PDA_{S1} = \frac{max\big(0,\ (3.333 - 3.617)\big)}{3.617} = \frac{0}{3.617} = 0$$

$$NDA_{S1} = \frac{max\big(0,\ (3.617 - 3.333)\big)}{3.617} = \frac{0.284}{3.617} = 0.079$$

On this basis, we use Eqs. (16) and (17) and multiply PDA and NDA with the overall weights of the various criteria in Table 8. Table 11 lists the SP_i and SN_i values. Here, SP_A and SN_A are determined as follows.

$$SP_A = 0 + 0 + 0 + 0 + 0.001 + 0.001 + 0.001 + 0.005$$

$$+0.001 + 0 + 0.001 + 0 + 0 + 0.001 = 0.011$$

$$SN_A = 0.005 + 0.003 + 0.001 + 0 + 0 + 0 + 0 + 0 + 0$$

$$+0 + 0 + 0.001 + 0 + 0 = 0.011$$

Table 9. *Evaluation Results of The Alternatives Based On Selected Criteria*

Alter-native	S_1	S_2	S_3	S_4	I_1	I_2	I_3	E_1	E_2	E_3	E_4	C_1	C_2	C_3
A	3.333	3.556	3.667	3.815	3.852	3.815	3.778	4.111	3.778	3.889	3.815	3.519	3.333	3.407
B	3.926	3.926	3.741	3.852	3.889	3.778	3.778	3.667	3.704	3.815	3.815	3.444	3.222	3.556
C	3.593	3.778	3.815	3.852	3.667	3.704	3.667	3.704	3.593	3.926	3.630	3.519	3.481	3.333
AVj	3.617	3.753	3.741	3.840	3.802	3.765	3.741	3.827	3.691	3.877	3.753	3.494	3.346	3.432

Table 10. *The Positive and Negative Distances From The Average*

Altern -ative		S_1	S_2	S_3	S_4	I_1	I_2	I_3	E_1	E_2	E_3	E_4	C_1	C_2	C_3
P D A	A	0	0	0	0	0.013	0.013	0.010	0.074	0.023	0.003	0.016	0	0.004	0.007
	B	0.085	0.046	0	0.003	0.023	0.003	0.010	0	0.003	0	0.016	0.014	0.037	0
	C	0	0.007	0.020	0.003	0	0	0	0	0	0.013	0	0	0	0.029
N D A	A	0.079	0.053	0.020	0.006	0	0	0	0	0	0	0	0.007	0	0
	B	0	0	0	0	0	0	0	0.042	0	0.016	0	0	0	0.036
	C	0.007	0	0	0	0.036	0.016	0.020	0.032	0.027	0	0.033	0.007	0.041	0

The normalized weighted sums of *PDA* and *NDA* are calculated using Eqs. (18) and (19) respectively. Equation (20) computes the appraisal score AS_i of the chosen alternative, as depicted in Table 11. To better understand the mentioned concept, an example is presented as follows.

$$NSP_A = \frac{0.011}{max(0, 0.017, 0.005)} = \frac{0.011}{0.017} = 0.647$$

$$NSN_A = 1 - \frac{0.011}{max(0, 0.007, 0.016)} = 1 - \frac{0.011}{0.016} = 0.313$$

As a result, we now have:

$$AS_A = \frac{（0.647 + 0.313）}{2} = 0.480$$

Similar calculations are performed for the remaining options, and the results of AS_i appear in Table 11. The results indicate that financial accounting has the highest AS_B value of 0.797, followed by network reimbursement with a value of 0.480, and budget management with a value of 0.147.

Table 11. *Score and Ranking of Each Candidate*

Alternative	SP_i	SN_i	NSP_i	NSN_i	AS_i	Ranking
A	**0.011**	**0.011**	**0.647**	**0.313**	**0.480**	2
B	0.017	0.007	1.000	0.595	0.797	1
C	0.005	0.016	0.294	0.000	0.147	3

4.4. Discussion

This study takes an important step towards filling a gap in the literature by constructing a new evaluation model to determine the most important factors influencing FSSC adoption by Chinese commercial banks. We propose the hybrid model, which integrates ISSM and cost, to construct a multi-level structure that identifies 4 dimensions and 14 criteria. FSSC adoption is a complex MCDM issue, and there is a dependency relationship between different dimensions and criteria that commercial bank managers should understand before making any evaluation decision.

Based on data from the expert questionnaire survey, DEMATEL derives the weights of the evaluation dimensions and criteria. The results at the dimension level in descending order of influence are: system quality (S) (0.254), information quality (I) (0.251), service quality (E) (0.249), and cost (C) (0.246). System quality is crucial to the smooth running of banking operations and is of utmost concern to decision-makers. It is worth noting that the difference between the weights of cost and system quality dimensions is very small (0.008), indicating that their importance is also self-evident and that the influence of cost in FSSC adoption should not be ignored. The rationality and necessity of including the cost dimension in the evaluation model are validated. This reflects the consideration of the long-term value and comprehensive benefits of commercial banks in the comprehensive evaluation.

At the criterion level, reliability (S_1) is the most important criterion in the system quality dimension with the highest weight (0.254). It indicates that commercial banks are most concerned about system reliability, and platform developers should first improve their reliability by focusing on system stability and the absence of design flaws. Accuracy (I_1) is the criterion with the highest weight (0.335) among the information quality dimensions. It means that the value of information to commercial banks is of great concern, and platform developers should pay enough attention to the accuracy of information provided by the system. In addition, technicality (E_4) is the core criterion (0.255) in the service quality dimension, and maintenance cost (C_2) is the most important criterion (0.336) in the cost dimension. This suggests that the service technology level of platform developers and the maintenance cost of the system are relatively sensitive to users.

For subsequent EDAS analysis, this study looks at the three alternatives of FSSC in commercial banks (Table 11). The ranking results show that financial accounting (0.797) is superior to network reimbursement (0.495), while network reimbursement is superior to budget management (0.147). Financial accounting is the most adopted FSSC business system in commercial banks. This finding is in line with the current widespread adoption of FSSC in the finance domain for many years, where this system has a high level of stability, maturity, and acceptance in comparison to others. It confirms the validity and reasonableness of the proposed model for the evaluation of FSSC adoption.

The analysis also shows that FSSC has relatively low scores on the criteria of practicality (E_3) (3.815), immediacy (E_1) (3.667), system cost (C_1) (3.444), and maintenance cost (C_2) (3.222). This may be due to the cumbersome nature of the system in terms of operation, data not being updated fast enough, higher system construction and maintenance costs, or a more complex maintenance process. It reflects that commercial banks have higher requirements in

these 4 areas that need to be improved by platform developers.

5. Conclusion

FSSC has developed rapidly in recent years and is being widely used, however, there is no comprehensive understanding of the key factors affecting the evaluation of its adoption. This paper fills this research gap in the literature. The ranking of the key factors in the evaluation of FSSC adoption is an MCDM problem. This study constructs an integrated evaluation model combining ISSM and cost and proposes a hybrid method integrating DEMATEL and EDAS. Finally, the proposed model and methodology are validated by a case study of FSSC business systems in China.

The main contributions of this paper are as follows. (1) This study extends the application scope of the ISSM by applying it to the FSSC domain. (2) Studies on the topic of FSSC adoption mostly ignore or do not include the cost to users. We propose a comprehensive evaluation framework that encompasses system quality, information quality, service quality, and cost factors to supplement the framework that identifies the influences of FSSC adoption. (3) A new hybrid MCDM methodology, integrating DEMATEL and EDAS, is introduced to the FSSC field. DEMATEL effectively captures the complex interrelationships among criteria, while EDAS is employed to validate three alternatives of China's FSSC, demonstrating the efficacy of the proposed method. (4) Our study provides a valuable reference for commercial banks to understand FSSC adoption and is a useful reference for theoretical and practical implications.

5.1. Key Findings

The findings reveal that: (1) The weights of the dimensions in descending order are system quality, information quality, service quality, and cost, with system quality being identified as the most critical. (2) Although the cost dimension carries a lower weight than the others, its weight remains substantial, indicating that its influence on FSSC adoption cannot be overlooked. (3)The ranking of the alternatives shows that the financial accounting system is the optimal FSSC option, a result that aligns with its current widespread application in the market.

5.2. Discussion Implications for academia

First, this study combines ISSM and cost to construct a suitable model for evaluating FSSC adoption in commercial banks. Other studies have not constructed a corresponding evaluation model for FSSC system adoption. We thus fill an obvious knowledge gap in the literature.

Second, this study extends the application of ISSM to FSSC by defining and validating ISSM under the evaluation of the adoption of FSSC system criteria (dimensions/criteria), while complementing and validating cost as a valid evaluation dimension. The results of the study provide a reference for FSSC system adoption evaluation in commercial banks.

Finally, this study proposes a hybrid approach combining DEMATEL and EDAS to analyze the relationships among evaluation factors and to reveal their relative importance. This hybrid approach has not been applied before to evaluate the adoption of the FSSC system in commercial banks. This study verifies the validity of this hybrid approach in the evaluation of FSSC system adoption through a case study in China.

5.3. Implications for practitioners

First, FSSC plays an important role in the successful maintenance of FSSC in commercial banks, which in turn leads to the optimal allocation of resources and improved management. Therefore, this study identifies the key factors for the adoption of FSSC, which gives a valuable reference for commercial bank managers to successfully select FSSC business systems in order to promote the digitalization of their enterprises and enhance their competitiveness.

Second, the results of the study show that the weights of system quality, information quality, service quality, and cost are close to each other, but system quality is more important overall. This means that commercial banks are most concerned about this dimension when evaluating the adoption of FSSC systems. Cost is also a factor that should not be ignored. Commercial banks should consider it in terms of long-term value and overall benefits, given the current situation of uncertainty in the global economic development and intensified risks for financial institutions.

Finally, this study ranks the alternatives and shows that financial accounting is the highest priority in an FSSC business system. The results of the scores of the alternatives have been analyzed in depth. In fact, financial accounting systems have been developed earlier and have been widely used in enterprises for many years. They are technically mature. The results of this study match their actual use and validate them, thus offering insights and references for commercial banks to make adoption decisions.

5.4. Limitations and suggestions

Although this study contributes to both theory and practice, there are some limitations. First, this study is based on the modified ISSM and cost in order to construct evaluation criteria. Although it provides a new reference for similar assessments for practitioners, it may also exclude some possible influencing factors. Second, for subsequent researchers, only 4 evaluation dimensions and 14 criteria are employed herein. In the future, consideration may be given to incorporating different criteria to optimize the evaluation model. When calculating the weights, we simultaneously attempt to avoid any doubts arising from inconsistencies in the number of criteria in each dimension. Third, although typically employed for small-to-medium-scale decisions, the DEMATEL application here utilizes 27 responses from a highly specialized and reliable group of long-term FSSC professionals. This medium-sized sample is deemed adequate for establishing a stable consensus and identifying inter-criteria causalities. Future studies, however, are encouraged to employ larger and more culturally diverse samples to test the generalizability of our conclusions. Additionally, although this study combines various research methods, it cannot be ruled out that the use of other methods will lead to additional findings, such as the introduction of fuzzy sets, which can be incorporated into the methodology proposed in an evaluation framework by future studies.

References

Agrawal, V., Seth, N., & Dixit, J. K. (2022). A combined AHP–TOPSIS–DEMATEL approach for evaluating success factors of e-service quality: An experience from the Indian banking industry. *Electronic Commerce Research*, 22(3), 715–747. https://doi.org/10.1007/s10660-020-09430-3

Albashabsheh, A. A. N., Alhroob, M. N., Irbihat, B. E., & Javed, S. (2018). Impact of accounting information system in reducing costs in Jordanian banks. *International Journal of Research - GRANTHAALAYAH*, 6(7), 210–215. https://doi.org/10.29121/granthaalayah.v6.i7.2018.1300

Al-Hattami, H. M. (2021). Validation of the D&M IS success model in the context of accounting information systems of the banking sector in the least developed countries. *Journal of Management Control*, 32(1), 127–153. https://doi.org/10.1007/s00187-020-00310-3

Ali, B. J. A., & Salem, M. (2020). Information quality and data quality in accounting information system: Implications on the organization performance. *International Journal of Psychosocial Rehabilitation*, 24(5), 3258–3269. https://doi.org/10.37200/IJPR/V24I5/PR202034

Al-Okaily, A., Al-Okaily, M., Ai Ping, T. A., Al-Mawali, H., & Zaidan, H. (2021). An empirical investigation of enterprise system user satisfaction antecedents in Jordanian commercial banks. *Cogent Business and Management*, 8(1), 1–16. https://doi.org/10.1080/23311975.2021.1918847

Antonopoulou, M., & Kotsilieris, T. (2019). A literature review of user satisfaction models towards information system success. *International Journal of E-Services and Mobile Applications*, 11(2), 71–87. https://doi.org/10.4018/IJESMA.2019040105

Ayough, A., Shargh, S. B., & Khorshidvand, B. (2023). A new integrated approach based on base-criterion and utility additive methods and its application to supplier selection problems. *Expert Systems with Applications*, 221, 119740. https://doi.org/10.1016/j.eswa.2023.119740

Al-Qaysi, N., Mohamad-Nordin, N., & Al-Emran, M. (2020). Employing the technology acceptance model in social media: A systematic review. *Education and Information Technologies*, 25(6), 4961–5002. https://doi.org/10.1007/s10639-020-10197-1

Balana, B. B., Vinten, A., & Slee, B. (2011). A review on cost-effectiveness analysis of agri-environmental measures related to the EU WFD: Key issues, methods, and applications. *Ecological Economics*, 70(6), 1021–1031. https://doi.org/10.1016/j.ecolecon.2010.12.020

Bartu, G., & Muhammet, D. (2023). Evaluation of Supplier Selection in the Defense Industry Using q-Rung Orthopair Fuzzy Set-based EDAS Approach. *Expert Systems with Applications*, 222, 119846, https://10.1016/j.eswa.2023.119846

Baykasoğlu, A., & Gölcük, İ. (2017). Development of a two-phase structural model for evaluating ERP critical success factors along with a case study. *Computers and Industrial Engineering, 106*, 256–274. https://doi.org/10.1016/j.cie.2017.02.015

Burns, L. R., McCullough, J. S., Wholey, D. R., Kruse, G., Kralovec, P., & Muller, R. (2015). Is the System Really the Solution? Operating Costs in Hospital Systems. *Medical Care Research and Review*, 72(3), 247–272. https://doi:10.1177/1077558715583789

Campbell, A., & Strikwerda, J. (2013). The power of one: Toward the new integrated organization. *Journal of Business Strategy*, 2(34), 4–12, https://10.1108/02756661311310404

Cao, C. S., Jin, Y. C., & Huang, H. (2021). Research on the construction of enterprise financial shared service center based on cloud. *Computers and Industrial Engineering3S Web of Conferences 235*, 01041, https://10.1051/e3sconf/202123501041

Chen, J.-K. (2021). Improved DEMATEL-ISM integration approach for complex systems. *PLOS ONE*, 16(7), e0254694. https://doi:10.1371/journal.pone.0254694

Damenu, T. K., & Beaumont, C. (2017). Analysing information security in a bank using soft systems methodology. *Information & Computer Security*, 25(3), 240–258. https://doi.org/10.1108/ICS-07-2016-0053

DeLone, W. H., & McLean, E. R. (1992). Information systems success: The quest for the dependent variable. *Information Systems Research*, 3(1), 60–95. https://doi.org/10.1287/isre.3.1.60

DeLone, W. H., & McLean, E. R. (2003). The DeLone and McLean model of information systems success: A ten-year update. *Journal of Management Information Systems*, 19(4), 9–30. https://doi.org/10.1080/07421222.2003.11045748

DeLone, W. H., & McLean, E. R. (2016). Information systems success measurement. *Foundations and Trends® in Information Systems*, 2(1), 1–116. https://doi.org/10.1561/2900000005

Djimesah, I. E., Zhao, H., Okine, A. N. D., Duah, E., Kissi Mireku, K., & Adjei Budu, K. W. (2025). What factor is essential in successful crowdfunding: A MULTIMOORA-EDAS approach to explore factors that influence the success of crowdfunding campaigns. *Kybernetes*.54(2),909-935, https://doi.org/10.1108/K-05-2023-0893

Gabus, A., & Fontela, E. (1972), World problems, an invitation to further thought within the framework of DEMATEL. Switzerland, Geneva: Battelle Press Geneva Research Centre

Ghorabaee, M. K., Amiri, M., Zavadskas, E. K., & Turskis, Z. (2017). Multi-criteria group decision-making using an extended EDAS method with interval type-2 fuzzy sets. *Ekonomika a Manag*, 20(1),48–68, https://10.15240/tul/001/2017-1-004

Giri, B. C., Molla, M. U., & Biswas, P. (2022). Pythagorean fuzzy DEMATEL method for supplier selection in sustainable supply chain management. *Expert Systems with Applications*, 193, 116396. https://doi.org/10.1016/j.eswa.2021.116396

Gorla, N., Somers, T. M., & Wong, B. (2010). Organizational impact of system quality, information quality, and service quality. *Journal of Strategic Information Systems*, 19(3), 207–228. https://doi.org/10.1016/j.jsis.2010.05.001

Goth, J., Catala-Perez, D., & Hedderich, B. (2025). Shared service centers (SSCs) and administrative cost reduction: A systematic review and research agenda. *Journal of Service Theory and Practice*. https://doi.org/10.1108/JSTP-10-2024-0345

Graf, F. (2002). Providing security for e-learning. *Computers and Graphics*, 26(2), 355–365. https://doi.org/10.1016/S0097-8493(02)00062-6

Grant, D. A. (1999). Using existing modeling techniques for manufacturing process reengineering: A case study. *Computers in Industry*, 40(1), 37–49. https://doi.org/10.1016/S0166-3615(99)00011-1

Guo, X., Wu, J., & Sun, M. (2024). Impact Factors of the Maturity of FSSC in the Digital Age: A Study Based on Structural Equation Modeling. *American Journal of Management Science and Engineering*, 9(6), 124–140. https://doi.org/10.11648/j.ajmse.20240906.12

He,Y., & Zhou, F. (2013).An empirical study on the key factors of implementing financial shared services in Chinese enterprise groups. *Accounting Research*,(10), 59-66+97.https://doi.org/10.3969/j.issn.1003-2886.2013.10.008

Hernandez-Ortega, B., Aldas-Manzano, J., Ruiz-Mafe, C., & Sanz-Blas, S. (2017). Perceived value of advanced mobile messaging services: A cross-cultural comparison of Greek and Spanish users. I*nformation Technology and People*, 30(2), 324–355. https://doi.org/10.1108/ITP-01-2014-0017

Hossein, H., Xu, H., & Emmanuel, S. (2018). Digitalization and big data mining in banking. *Big Data and Cognitive Computing*, 2(3),18, https:// doi.org/10.3390/bdcc2030018

Hsu, C. W., & Yeh, C. C. (2017). Understanding the factors affecting the adoption of the Internet of Things. *Technology Analysis and Strategic Management*, 29(9), 1089–1102. https://doi.org/10.1080/09537325.2016.1269160

Hsu, C. W. and Yeh, C. C. (2018). Understanding the critical factors for successful M-commerce adoption. *International Journal of Mobile Communications*, 16(1),50–62. https://doi.org/10.1504/IJMC.2018.088272

Hsu, T., Lin, L., & Chen, C. (2024). Evaluations of brand management strategies for luxury goods with a hybrid fuzzy multicriteria decision making model. *Managerial and Decision Economics*, 45(5), 3297–3315. https://doi.org/10.1002/mde.4197

Jeyaraj, A. (2020). DeLone and McLean models of information system success: Critical meta-review and research directions. *International Journal of Information Management*, 54, 102139. https://doi.org/10.1016/j.ijinfomgt.2020.102139

Jia, S. Q. (2020). Problems and solutions of financial management transformation under the establishment of financial shared service center. *Open Journal of Social Sciences*, 08(3), 251–257. https://doi.org/10.4236/jss.2020.83023

Jafari-Sadeghi, V., Mahdiraji, H. A., Busso, D., and Yahiaoui, D. (2022). Towards agility in international high-tech SMEs: Exploring key drivers and main outcomes of dynamic capabilities. *Technological Forecasting and Social Change*, 174, 121-272, https://10.1016/j.techfore.2021.121272

Kahraman, C., Keshavarz Ghorabaee, M., Zavadskas, E. K., Cevik Onar, S., Yazdani, M., & Oztaysi, B. (2017). Intuitionistic fuzzy EDAS method: An application to solid waste disposal site selection. *Journal of Environmental Engineering and Landscape Management*, 25(1), 1–12. https://doi.org/10.3846/16486897.2017.1281139

Khorasane, M. A., Alimohammadlou, M., Klockner, K., Kamalinia, M., & Jahangiri, M. (2022). Identifying the influential contributing factors to micro-enterprises' workplace accidents using a hybrid D-DEMATEL-IFISM method. *Expert Systems with Applications*, 200, 117059. https://doi.org/10.1016/j.eswa.2022.117059

Kumarahadi, Y. K., Winarno, W. W., & Kurniawan, M. P. （2020）. D&M IS Success Model dan WebQual 4.0 pada Siakad Online STMIK Sinar Nusantara Surakarta. *Jurnal Ilmiah SINUS, 18*(1), 25–34. https://doi.org/10.30646/sinus.v18i1.455

Karatop, B., Taşkan, B., Adar, E. and Kubat, C. (2021). Decision analysis related to the renewable energy investments in Turkey based on a Fuzzy AHPEDAS Fuzzy FMEA approach. *Computers & Industrial Engineering*, 151,106958.   https://doi.org/10.1016/j.cie.2020.106958

Karuppiah, K., Sankaranarayanan, B., & Ali, S. M. (2022). Exploring key enablers of sustainable transportation in small-and medium-sized manufacturing enterprises. *Kybernetes*, 51(11), 3394–3418. https://doi.org/10.1108/K-05-2021-0416

Keshavarz Ghorabaee, M., Zavadskas, E. K., Olfat, L., & Turskis, Z. (2015). Multi-Criteria Inventory Classification Using a New Method of Evaluation Based on Distance from Average Solution (EDAS). *Informatica*, 26(3), 435–451. https://doi.org/10.15388/Informatica.2015.57

Koohathongsumrit, N., & Luangpaiboon, P. (2022). An integrated FAHP–ZODP approach for strategic marketing information system project selection. *Managerial and Decision Economics*, 43(6), 1792–1809. https://doi.org/10.1002/mde.3489

Lederer, A. L., & Prasad, J. (1993). Information systems software cost estimating: A current assessment. *Journal of Information Technology*, 8(1), 22–33. https://doi.org/10.1057/jit.1993.4

Levin, H. M., & Belfield, C. (2015). Guiding the development and use of cost-effectiveness analysis in education. *Journal of Research on Educational Effectiveness*, 8(3), 400–418. https://doi.org/10.1080/19345747.2014.915604

Li, H., Zhu, W., Dieulle, L., & Deloux, E. (2022). Condition-based maintenance strategies for stochastically dependent systems using Nested Lévy copulas. *Reliability Engineering & System Safety*, 217, 108038. https://doi.org/10.1016/j.ress.2021.108038

Limam Mansar, S. L., Reijers, H. A., & Ounnar, F. (2009). Development of a decision-making strategy to improve the efficiency of BPR. *Expert Systems with Applications*, 36(2), 3248–3262. https://doi.org/10.1016/j.eswa.2008.01.008

Lin, K. P., Tseng, M. L., & Pai, P. F. (2018). Sustainable supply chain management using approximate fuzzy DEMATEL method. *Resources, Conservation and Recycling*, 128, 134–142. https://doi.org/10.1016/j.resconrec.2016.11.017

Lu, Y. H., Yeh, C. C., & Kuo, T. W. (2024). Exploring the critical factors affecting the adoption of blockchain: Taiwan's banking industry. *Financial Innovation*, 10(1), 23. https://doi.org/10.1186/s40854-023-00523-0

Li, X., Han, Z., Zhang, R., Zhang, Y., and Zhang, L. (2020). Risk assessment of hydrogen generation unit considering dependencies using integrated DEMATEL and TOPSIS approach. *International Journal of Hydrogen Energy*, 45, 29630-29642. https://doi.org/10.1016/j.ijhydene.2020.07.243

Li, P., Liu, J., Wei, C., & Liu, J. (2022). A new EDAS method based on prospect theory for Pythagorean fuzzy set and its application in selecting investment projects for highway. *Kybernetes*, 51(8), 2636–2651. https://doi.org/10.1108/K-01-2021-0066

Ma, Q., Lin, C.-T., & Chen, Z. (2024). A Hybrid Evaluation Model for e-Learning Platforms Based on Extended TOE Framework. *International Journal of Information Technology & Decision Making*, 23(03), 1171–1202. https://doi.org/10.1142/S0219622023500359

Martín-Navarro, A., Lechuga Sancho, M. P., & Medina-Garrido, J. A. (2021). Testing an instrument to measure the BPMS-KM Support model. *Expert Systems with Applications*, 178, 115005. https://doi.org/10.1016/j.eswa.2021.115005

Mason, R. O. (1978). Measuring information output: A communication systems approach. *Information and Management*, 1(4), 219-234.https://doi.org/10.1016/0378-7206(78)90028-9

Mohammed, A., & Ju, X. F. (2019). The antecedents of information system success in the banking industry: An empirical investigation of the DeLone and McLean model. *International Journal of Management Science and Business Administration*, 5, 43–58. https://doi.org/10.18775/ijmsba.1849-5664-5419.2014.53.1006

Mitra, A. (2020).Selection of cotton fabrics using EDAS method. *Journal of Natural Fibers*, 1-13. https://doi.org/10.1080/15440478.2020.1821289

Niehaves, B., & Krause, A. (2010). Shared service strategies in local government – a multiple case study exploration. *Transforming Government: People, Process and Policy*, 4(3), 266–279. https://doi.org/10.1108/17506161011065235

Orman, L. (1994). Information cost as a determinant of system architecture. *Information and Software Technology*, 36(3), 165–172. https://doi.org/10.1016/0950-5849(94)90055-8

Ou, P., Hua, R., & Zhang, C. (2025). The influencing factors of financial shared service implementation from a dynamic perspective. *Business Process Management Journal*, 1–29. https://doi.org/10.1108/BPMJ-02-2025-0240

Özçelik, G. (2022). The attitude of MCDM approaches versus the optimization model in finding the safest shortest path on a fuzzy network. *Expert Systems with Applications*, 203, 117472. https://doi.org/10.1016/j.eswa.2022.117472

Özdemirci, F., Yüksel, S., Dinçer, H., & Eti, S. (2023). An assessment of alternative social banking systems using T-Spherical fuzzy TOP-DEMATEL approach. *Decision Analytics Journal*, 6, 100184. https://doi:10.1016/j.dajour.2023.100184

Ozkan, S., & Koseler, R. (2009). Multi-dimensional students' evaluation of e-learning systems in the higher education context: An empirical investigation. *Computers and Education*, 53(4), 1285–1296. https://doi.org/10.1016/j.compedu.2009.06.011

Petter, S., DeLone, W. H., & McLean, E. R. (2008). Measuring information systems success: Models, dimensions, measures, and interrelationships. *European Journal of Information Systems*, 17(3), 236–263. https://doi.org/10.1057/ejis.2008.15

Philipp Clemens Richter, Rolf Brühl (2017). Shared service center research: A review of the past, present, and future. *European Management Journal*, 35(1), 26–38. https://doi:10.1016/j.emj.2016.08.004

Prybutok, V. R., Zhang, X., & Ryan, S. D. (2008). Evaluating leadership, IT quality, and net benefits in an e-government environment. *Information and Management*, 45(3), 143–152. https://doi.org/10.1016/j.im.2007.12.004

Gupta, R., & Kumar, S. (2022). Correlation Coefficient Based Extended VIKOR Approach Under Intuitionistic Fuzzy Environment. International Journal of Information and Management Sciences, 33(1). https://doi.org/10.6186/IJIMS.202203_33(1).0003

Ramayah, T., Ahmad, N. H., & Lo, M. C. (2010). The role of quality factors in intention to continue using an e-learning system in Malaysia. *Procedia – Social and Behavioral Sciences*, 2(2), 5422–5426. https://doi.org/10.1016/j.sbspro.2010.03.885

Ren, J., & Toniolo, S. (2018). Life cycle sustainability decision-support framework for ranking of hydrogen production pathways under uncertainties: An interval multi-criteria decision making approach. *Journal of Cleaner Production*, 175, 222–236. https://doi.org/10.1016/j.jclepro.2017.12.070

Rizal, H., Yussof, S., Amin, H., & Chen-Jung, K. (2018). EWOM towards homestays lodging: Extending the information system success model. *Journal of Hospitality and Tourism Technology*, 9(1), 94–108. https://doi.org/10.1108/JHTT-12-2016-0084

Rohith, R.(2013). A literature review on shared services. *African Journal of Business Management*,7(1), 1-7.https://doi.org/10.5897/AJBM12.1202

Sapty Rahayu, F., Apriliyanto, R., & Sigit Purnomo Wuryo Putro, Y. (2018). Analisis Kesuksesan Sistem Informasi Kemahasiswaan (SIKMA) dengan Pendekatan Model DeLone dan McLean. *Indonesian Journal of Information Systems*, 1(1), 34–46. https://doi.org/10.24002/ijis.v1i1.1704

Strikwerda, J. (2014). Shared Service Centers: From Cost Savings to New Ways of Value Creation and Business Administration. Shared Services as a New Organizational Form. *Emerald Group Publishing Limited.*13(1),1–15. https://doi:10.1108/S1877-636120140000013000

Su, X. Q. (2019). An analysis of the sharing economy model under the enterprise financial management transformation. *China Circulation Economy*, 4, 43–44

Tam, C., & Oliveira, T. (2017). Understanding mobile banking individual performance: The DeLone and McLean model and the moderating effects of individual culture. *Internet Research*, 27(3), 538–562. https://doi.org/10.1108/IntR-05-2016-0117

Tarwoto, T., & Kuncoro, A. P. (2019). Evaluasi Penerapan Sistem Informasi Smart Prodi dengan Pendekatan Delone Mclean dan Framework COBIT 5 (Studi Kasus: sistem Penjadwalan Perkuliahan STMIK Amikom Purwokerto). *Jurnal MATRIK*, 18(2), 222–236, https://10.30812/matrik.v18i2.367

Torkayesh, A. E., Deveci, M., Karagoz, S., & Antucheviciene, J. (2023). A state-of-the-art survey of evaluation based on distance from average solution (EDAS): Developments and applications. *Expert Systems with Applications*, 221, 119724. https://doi.org/10.1016/j.eswa.2023.119724

Tsai, P. H., Lin, G. Y., Zheng, Y. L., Chen, Y. C., Chen, P. Z., & Su, Z. C. (2020). Exploring the effect of Starbucks' green marketing on consumers' purchase decisions from consumers' perspective. *Journal of Retailing and Consumer Services*, 56(9), 102162. https://doi.org/10.1016/j.jretconser.2020.102162

Urbach, N., Smolnik, S., & Riempp, G. (2010). An empirical investigation of employee portal success. *Journal of Strategic Information Systems*, 19(3), 184–206. https://doi.org/10.1016/j.jsis.2010.06.002

Watjatrakul, B., & Vatanapitukpong, V. (2025). Effects of Partnership Quality and the Attributes of Clients and Vendors on the Success of Outsourced ERP System Implementation. *International Journal of Information and Management Sciences*, *36*(1). https://doi.org/10.6186/IJIMS.202503_36(1).0001

Wang. (2023). Practice and Improvement of Su Ning's Financial Shared Service Center under the Background of Informatization. *Highlights in Business, Economics and Management*, 11,280-286. https://doi.org/10.54097/hbem.v11i.8144

Yang, Y., Liu, Q., Song, J., & Zhou, M. (2021). The influence mechanism of financial shared service mode on the competitive advantage of enterprises from the perspective of organizational complexity: A force field analysis. *International Journal of Accounting Information Systems*, 42, 1–21. https://doi.org/10.1016/j.accinf.2021.100525

Yadav, S., & Kapoor, S. (2024). RETRACTED ARTICLE: Adopting artificial intelligence (AI) for employee recruitment: the influence of contextual factors. *International Journal of System Assurance Engineering and Management,* 15(5), 1828–1840. https://doi:10.1007/s13198-023-02163-0

Yazdi, M., Khan, F., Abbassi, R., & Rusli, R. (2020). Improved DEMATEL methodology for effective safety management decision-making. *Safety Science*, 127, 104705. https://doi.org/10.1016/j.ssci.2020.104705

Yovita, K.K., Winarno, K.K., & Kurniawan, M.P. (2020). D&M IS Success Model dan WebQual 4.0 pada Siakad Online STMIK Sinar Nusantara Surakarta. Jurnal Ilmiah Sinus (JIS), 18(1), 25. https://10.30646/sinus.v18i1.455

Zhang, S. Q., Wei, G. W., Gao, H., Wei, C., & Wei, Y. (2019). EDAS method for multiple criteria group decision making with picture fuzzy information and its application to green suppliers selections. *Technological and Economic Development of Economy*, 25(6), 1123–1138. https://doi.org/10.3846/tede.2019.10714

Zhu, Z. W., Mei, A. K. C., Liao, Y. H., Tzeng, G. H., & Huang, S. W. (2022). The Exploration of Strategic Indicators of Promoting University Social Responsibility Using Hybrid Multi-Criteria Decision-Making Methods. *International Journal of Information and Management Sciences*, 33(4). https://doi.org/10.6186/IJIMS.202212_33(4).0002

Han-Long Chen
[1] School of Finance and Accounting, Fuzhou University of International Studies and Trade, Fuzhou, China
[2] Department of Business Administration, Ming Chuan University, Taiwan
E-mail address: chenhanlong@fzfu.edu.cn
Major area(s): Financial Management, Management Information Systems, and Corporate Governance.

Chuan Lee
Department of Business Administration, Ming Chuan University, Taiwan
E-mail address: clee@mail.mcu.edu.tw
Major area(s): Knowledge Management, Financial Management, Management Theory, and Marketing Management.

Chin-Tsai Lin
Department of Business Administration, Ming Chuan University, Taiwan
E-mail address: ctlin@mail.mcu.edu.tw
Major area(s): Operations Research, Optimization Theory, and Their Practical Applications.