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RESEARCH ARTICLE

Optimization of Financial Evaluation Index System from the Perspective of Artificial Intelligence Algorithm and Cloud Network Security

Jingyi Lu*

Faculty of Social Sciences, University of Southampton, Southampton, SO17 1BJ, United Kingdom

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***Corresponding Author:**

15239834911@163.com

ABSTRACT

The financial evaluation index system is an important basis for enterprise policymakers and investors to make decisions and invest. However, the traditional financial index system has some problems, such as singleness, static and inaccurate. This paper aimed to explore how to optimize the financial evaluation index system by using computer vision algorithm and fuzzy mathematics method in order to improve its accuracy and practicality. This paper explained the optimization of financial evaluation index system, analyzed the application of computer vision algorithm and fuzzy mathematics, and put forward fuzzy comprehensive evaluation method. Finally, this paper carried out simulation experiments on the optimization of financial evaluation index system. The experimental results show that the cash flow score of subsidiary 1 was 8.4 and the solvency score was 8.2 based on the financial evaluation index constructed from the perspective of computer vision algorithm and fuzzy mathematics. The cash flow score of subsidiary 2 was 8.6 and the solvency score was 8.5; The cash flow score of subsidiary 3 was 8.4 and the solvency score was 8.2; Subsidiary 4 had a cash flow rating of 8.5 and a solvency rating of 8.4. Through the optimization of the index system, enterprises can better identify their advantages and disadvantages, and take corresponding measures to improve them.

1. INTRODUCTION

Enterprises are facing more and more challenges, and the financial evaluation index system has become an important reference for enterprise decision-making. The traditional financial evaluation index system is mainly based on accounting data, such as assets, liabilities and income, but these indicators often only reflect the surface situation of enterprises, which is difficult to fully and accurately reflect the real situation of enterprises. Therefore, how to optimize the index system for these problems has become the focus and challenge of research. The development of computer vision algorithms and fuzzy mathematics methods provides new ideas and methods to optimize the financial evaluation index system. By using computer vision algorithm, it can automatically identify and extract indicators in financial statements, visualize data, and improve the efficiency and accuracy of data processing. Fuzzy mathematical methods can be used to deal with the uncertainty in financial data, evaluate multiple financial indicators, and help investors formulate more scientific investment strategies. Therefore, the study of the application of computer vision algorithm and fuzzy

mathematics in the financial evaluation index system has important background significance for optimizing the financial evaluation index system and improving the efficiency and accuracy of data processing.

Based on the existing research results, scholars have carried out relevant research on financial evaluation indicators. In the context of the transition to international financial reporting standards, the development of an analytical method for his consolidated Russian financial statements, prepared in accordance with international format requirements, is particularly important. In order to develop the analysis method of consolidated financial statements, PRODANOVA N.A. has developed the key indicators of comprehensive business and the coefficient method of related indicators on the basis of application system analysis (PRODANOVA et al., 2019). Mundra Sruti's goal is to assess India's alternative financial stress indicators in terms of tracking crisis events, mapping business cycles and the macroeconomic impact of stress indices (Mundra et al., 2021). Majeed Manal Hameed aimed to develop the overall performance of private insurance companies and improve their activity level through qualitative and quantitative comparative research methods to adapt to social progress (Majeed et al., 2018). Zelhuda Shamsuddin pointed to the financial and non-financial indicators that most importantly reflect the business and can be used to check the performance of cooperatives. The most important thing is to show which financial ratios reflect the cooperative's business and financial situation (Zelhuda et al., 2018). However, these scholars lack a certain technical demonstration on the exploration of financial evaluation indicators. After research, it is found that fuzzy mathematics is better for financial evaluation indicators. This paper consulted the relevant literature on fuzzy mathematics.

Some scholars have also done some research on fuzzy mathematics. Financial risk assessment is very important for enterprises to identify potential financial risks, provide decision-making basis for financial risk management, and prevent and reduce risk losses. The basic problems that arise when financial risk assessments are considered are related to strong ambiguity and inaccuracies. Peng Xindong gave a new fuzzy scoring function to deal with the comparison problem (Peng et al., 2020). Recognizing the state of universities and undermining their functions through performance reviews can help people adopt more appropriate educational, research and institutional policies to manage the university system. Salman Nazari-Shirkouhi determined the importance of services and activities provided by universities through the balanced scorecard method, and implemented the performance evaluation structure based on the comprehensive fuzzy multi criteria decision-making method (Salman et al., 2020). However, these scholars have not studied the optimization of financial evaluation index system from the perspective of computer vision algorithm and fuzzy mathematics, but only from a shallow level.

Financial evaluation index system is an important tool for enterprise decision-making, but the existing index system has limitations in the face of high-dimensional and complex data. Therefore, this paper proposes an optimization method of financial evaluation index system based on computer vision algorithm and fuzzy mathematics. First, a data set is established by collecting a large number of financial data and related indicators. Then, computer vision algorithms can be used to process and analyze these data, extract important features, and then build a more comprehensive and accurate financial index system. At the same time, this paper combines the theory of fuzzy mathematics to model and analyze the correlation between indicators, so as to make the weight between indicators more reasonable and scientific. Finally, the optimized financial evaluation index system is applied to a practical case, and the results show that this method can effectively identify the potential risks of enterprises and improve the accuracy and reliability of decision-making.

2. METHODS OF FINANCIAL INDICATORS FROM THE PERSPECTIVE OF COMPUTER VISION ALGORITHMS AND FUZZY MATHEMATICS

2. 1 Optimization of Financial Evaluation Index System

When optimizing the financial evaluation index system, it would need to consider the following aspects.

The first is to identify key indicators. In a complex index system, enterprises should focus on the indicators that best reflect business conditions, the so-called key indicators. Enterprises can determine key indicators according to their own development objectives and strategies, and list them as the first consideration. Generally speaking, the main indicators of concern to enterprises include profit, return on assets, cash flow and so on.

The second is to improve the index classification system. Financial indicators can be reasonably classified according to their fields or functions, so that enterprises can better understand their internal operations (Ali et al., 2022; Sangwa et al., 2018). For example, it can be classified according to profit, financial risk, asset and liability structure, so as to have a more comprehensive understanding of the financial situation of enterprises.

The third is to introduce non-financial indicators. In addition to traditional financial indicators, some non-financial indicators can be introduced, such as customer satisfaction, employee satisfaction, product quality, etc., to comprehensively evaluate the business performance of enterprises (Iacuzzi Silvia, 2022; Seyedi et al., 2019). These indicators can be measured in various ways, such as market surveys and questionnaires, so as to help enterprises understand their performance in market competitiveness, employee satisfaction and customer loyalty.

The fourth is to optimize the data acquisition and processing process. In order to ensure the accuracy and timeliness of financial data, it is essential to establish a sound data collection and processing process. Enterprises can strengthen data management and analysis through information means, such as the use of financial software, databases and other technical tools, in order to improve the efficiency of data collection and processing.

The last is to formulate a performance evaluation mechanism. According to the index system, the corresponding performance evaluation mechanism is formulated to evaluate the actual performance, which can find problems and put forward improvement measures to promote enterprises to continuously optimize their operation and management. Enterprises can formulate reward and punishment mechanisms to encourage employees to actively participate, and establish a performance appraisal system to supervise employees' behavior in order to achieve the purpose of continuous improvement.

In the information age, the financial evaluation index system has gradually changed from traditional human centered to machine centered (Narimissa et al., 2020; Kilci Esra N, 2021). In the new era, the use of computer vision technology (CVT for short here) and fuzzy mathematics principles to analyze and evaluate the financial situation of enterprises has become a research focus. CVT realizes the functions of target image segmentation, feature extraction and target recognition through computer recognition and classification of target images. The principle of fuzzy mathematics is to comprehensively evaluate enterprises by establishing a fuzzy evaluation matrix and considering the relationship between influencing factors and various fuzzy factors. This paper aims to study the optimization of financial evaluation index system from the perspective of computer vision algorithm and fuzzy mathematics. Figure 1 is the overall framework of this study.

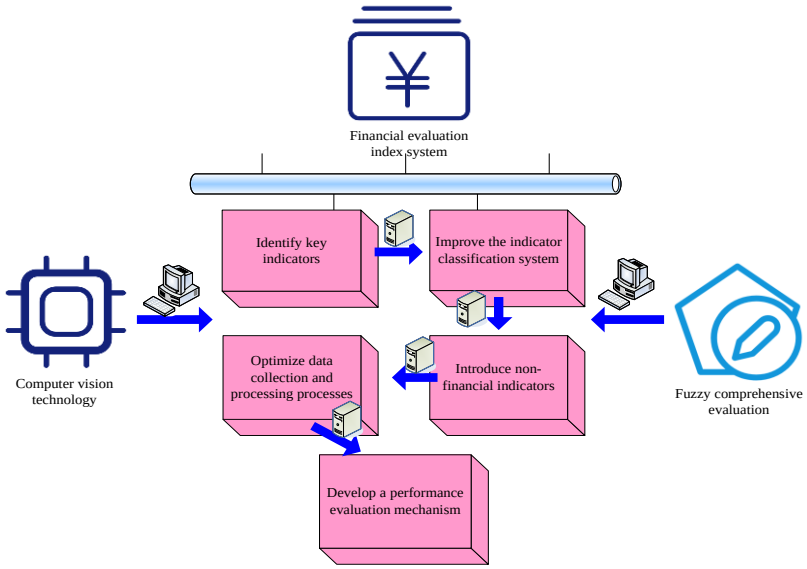

Figure 1 overall framework

2. 2 Application of CVT

The basic principle of CVT is that image processing algorithm is a technology of image recognition and understanding based on software and hardware systems in computers, which is widely used in video image processing, recognition and analysis, monitoring, machine vision, motion analysis and other fields. The basic framework of CVT is mainly divided into perception and processing. The perception part includes acquisition, storage and transmission, and the processing part is mainly visual processing. With the improvement of computer hardware performance, the processing speed and recognition accuracy of images are constantly improved, which makes up for the shortcomings of traditional imaging technology in identifying high-speed moving targets to a certain extent. Because CVT can identify targets and make decisions quickly and efficiently, it has been widely used in the field of computer vision. In specific applications, CVT can be divided into two basic forms: target detection and target tracking. Target detection technology can be widely used in object recognition, motion analysis, behavior recognition and other fields. In the field of target tracking, CVT can be used to locate and track moving objects, that is, to track the marks and trajectory on moving objects. Because moving objects generally have uncertain characteristics, such as moving direction, speed and other information, it is necessary to use CVT to locate and track moving objects. In short, the application of CVT effectively makes up for the shortcomings of traditional imaging technology, and would bring great convenience to people's life.

2.3 Application of Fuzzy Mathematics in Finance

The principle of fuzzy mathematics is a mathematical theory based on fuzzy sets. The basic idea is as follows: for a thing, it can be described by a fuzzy set, such as "black", "None" and so on. There may be some ambiguity between these words, but they are not required to be precise in describing things. Fuzzy sets can be expressed by membership functions, and then evaluated comprehensively, so that things can be described and evaluated quantitatively. With the rapid development of CVT, the combination of CVT and financial analysis has realized the intellectualization of financial analysis to a certain extent. The application of CVT in enterprise financial analysis is mainly reflected in three aspects: image processing, feature extraction and pattern recognition. Among them, image processing uses computers to segment and extract features from the data provided by enterprises, and converts them into feature values that can be used for evaluation. Pattern recognition is to transform existing information or characteristic values provided by targets into evaluation

indicators. Through the steps, the required evaluation indicators can be obtained. From the perspective of financial analysis, this paper uses CVT to judge the financial situation of enterprises with the following advantages: first, it is easy to operate. It only needs to provide simple information for the evaluated object and does not need to master any professional knowledge. Second, the speed is fast, and the image processing task can be completed in a few seconds; Third, the effect is good, and the evaluation results of financial situation would be accurately reflected in the evaluated object. Therefore, it can be said that CVT has broad application prospects.

2.4 Fuzzy Comprehensive Evaluation Method

Fuzzy comprehensive evaluation method is a commonly used multi index decision-making method, which can solve the uncertainty and fuzziness in complex problems. In the optimization of financial evaluation index system, fuzzy comprehensive evaluation method can be well applied (Krasodomska et al., 2021; Alomary Fahad Omar, 2020). First of all, the financial evaluation index system usually contains multiple indicators, which may affect and restrict each other. By using the fuzzy comprehensive evaluation method, the importance of each index can be quantified, so as to get a comprehensive evaluation result. Secondly, the optimization of the financial evaluation index system needs to consider the weight distribution between different indicators (Nadir et al., 2019). Using traditional methods such as weighted average method or analytic hierarchy process can easily lead to too subjective or inaccurate results. Fuzzy comprehensive evaluation method can fully consider the relationship and uncertainty between various indicators, so as to obtain more objective and scientific weight distribution results. Finally, the purpose of optimizing the financial evaluation index system is to improve the financial performance and management level of enterprises. Therefore, fuzzy comprehensive evaluation method has broad application prospects in the optimization of financial evaluation index system, and has been adopted by many enterprises and institutions.

The fuzzy relationship matrix t is a fuzzy transformer that maps factor set I to comment set B. When the weight vector s of a set of factors is input, the fuzzy relationship matrix t can generate the corresponding evaluation result n.

In this paper, multi-level fuzzy comprehensive evaluation is used for evaluation, in which the mathematical model can include one level and multi-level fuzzy evaluation models. Specifically, the establishment of a secondary evaluation model is taken as an example.

(1) Determining the factor level: the factor set I to be evaluated can be divided into Z subsets.

$$I = \{i_1, i_2, \cdots, i_o, \cdots, i_z\}\ (o = 1,2, \cdots, z) \quad (1)$$

i_o is the o-th factor in the first level, that is, the highest level, which is determined by M factors in the second level, that is:

$$I_o = \{i_{o1}, i_{o2}, \cdots, i_{oj}, \cdots, i_{om}\}\ (j = 1,2, \cdots, m) \quad (2)$$

(2) Establish a weight set: According to the importance of each factor in each level, the corresponding weight value is given to obtain each weight set.

Level 1:

$$S = \{s_1, s_2, \cdots, s_z\} \quad (3)$$

Level 2:

$$S_o = \{s_{o1}, s_{o2}, \cdots, s_{om}\} \quad (4)$$

(3) Establish alternative set B: The alternative set represents the various possible evaluation results of an evaluation object, which may be uncertain and vague, but they are more in line with people's understanding and usage habits. This uncertainty and ambiguity is related to the way the evaluation system and its factors are described.

Alternative sets are generally expressed as:

$$B = \{b_1, b_2, \cdots, b_q\} (5)$$

(4) First level fuzzy comprehensive evaluation: The individual evaluation of each factor in the first level should consider the comprehensive evaluation results of multiple factors in the second level. Let the single factor judgment matrix T_o of the second level be

$$T_o = \begin{bmatrix} t_{o11} & t_{o12} & \cdots & t_{o1q} \\ t_{o21} & t_{o22} & \cdots & t_{o2q} \\ \vdots & \vdots & \ddots & \vdots \\ t_{om1} & t_{om2} & \cdots & t_{omq} \end{bmatrix} (6)$$

The number of T_o matrix rows is determined by the number of t_{ok}, that is, the number of matrix columns is determined by the number of sets. After considering the weight, the first level fuzzy comprehensive evaluation set N_o is obtained as follows:

$$N_o = S_o \cdot T_o (7)$$

(5) Secondary fuzzy comprehensive evaluation: Regardless of the hierarchy, the ultimate goal is to get the highest level of comprehensive evaluation results. Here, the single factor evaluation matrix T_o of the secondary fuzzy comprehensive evaluation is:

$$T_o = \begin{bmatrix} N_1 \\ N_2 \\ \vdots \\ N_z \end{bmatrix} = \begin{bmatrix} S_1 \cdot T_1 \\ S_2 \cdot T_2 \\ \vdots \\ S_o \cdot T_z \end{bmatrix} (8)$$

Then the secondary fuzzy comprehensive evaluation set N is:

$$N = S \cdot T_o = S \cdot \begin{bmatrix} S_1 \cdot T_1 \\ S_2 \cdot T_2 \\ \vdots \\ S_o \cdot T_z \end{bmatrix} = (n_1, n_2, \cdots, n_q) (9)$$

The multi-level fuzzy comprehensive evaluation model can reflect the hierarchical structure between the factors of the evaluation object, and avoid the problem of assigning weights in the face of a large number of factors.

3. EXPERIMENTAL RESULTS OF FINANCIAL EVALUATION INDEX SYSTEM OPTIMIZATION

3. 1 Data Collection

This paper selects Z technology company for experiment, which is mainly engaged in software development and consulting services. This paper collects the financial data and market indicators of the company in the past five years, and establishes an evaluation index system containing 10 financial indicators and 10 market indicators.

The weight change before and after the optimization of the index system mainly reflects the importance and impact of different indicators in enterprise performance evaluation. By optimizing the index system, the weight of each index can be determined more scientifically, so that they can more accurately reflect the financial situation and market performance of enterprises. The explanations of financial indicators and market indicators are displayed in Table 1 and table 2.

Table 1 interpretation of financial indicators

	Index	Explain
1	Return on total assets (A)	Proportion of total asset profit to total assets
2	Net profit margin (B)	Proportion of net profit to operating income
3	Return on capital (C)	Proportion of net profit in invested capital
4	Expense rate (D)	Proportion of operating costs and administrative expenses in operating revenue
5	Cash flow ratio (E)	Proportion of net cash flow from operating activities to sales revenue
6	Inventory turnover rate (F)	Ratio of enterprise sales revenue to average inventory
7	Accounts receivable turnover rate (G)	Ratio of enterprise sales revenue to average balance of accounts receivable
8	Asset liability ratio (H)	Proportion of total liabilities to total assets
9	Current ratio (I)	Ratio of current assets to current liabilities
10	Quick ratio (J)	Ratio of (current assets inventory) to current liabilities

Table 2 interpretation of market indicators

	Index	Explain
1	Market share (K)	Proportion of enterprise sales revenue in industry sales revenue
2	Customer satisfaction (L)	The extent to which the enterprise meets customer needs
3	Dealer satisfaction (M)	Satisfaction degree of cooperation between enterprises and distributors
4	Brand awareness (N)	Corporate brand awareness in the market
5	Marketing promotion expense rate (O)	Proportion of marketing and promotion expenses in sales revenue
6	Proportion of research and development (R&D) investment (P)	Proportion of R&D investment in sales revenue
7	Speed of new product development (Q)	The speed and frequency with which companies launch new products

8	Channel coverage (R)	Coverage area of enterprise product sales channels
9	Technical innovation capability (S)	Technological innovation and innovation protection capabilities of enterprises
10	Talent development and attraction (T)	The cultivation and attraction of enterprises to employees

In practical application, it usually sets up a set of target indicators, and then sorts and screens the selected evaluation indicators according to the weight of these target indicators, so as to establish a more comprehensive, accurate and reliable enterprise performance evaluation model. At the same time, by adjusting the weight of indicators, it can further optimize the prediction accuracy and stability of the performance evaluation model and improve its practicality and applicability. Therefore, the weight change before and after the optimization of the index system is of great significance in enterprise performance management and decision-making, and can help enterprises better understand their own development and trends. It can identify the problem and take corresponding measures to promote the sustainable development of enterprises. Among them, the financial data and market index data of Z Company in the past five years are displayed in tables 3 and 4.

Table 3 data analysis of financial indicators

Index	2018	2019	2020	2021	2022
A	13%	11%	12%	14%	15%
B	7%	6%	5%	8%	10%
C	22%	20%	21%	24%	26%
D	63%	65%	64%	62%	60%
E	2.5	2.3	2.1	2.6	2.8
F	4 times/year	3 times/year	3 times/year	4 times/year	5 times/year
G	6 times/year	5 times/year	4 times/year	7 times/year	8 times/year
H	42%	45%	47%	41%	38%
I	1.8	2	2.2	1.6	1.4
J	1.2	1.4	1.6	1	0.8

Table 4 data analysis of market indicators

Index	2018	2019	2020	2021	2022
K	12%	11%	10%	13%	14%

L	80%	82%	75%	85%	90%
M	70%	75%	78%	80%	85%
N	55%	56%	57%	58%	60%
O	8%	9%	10%	7%	6%
P	12%	13%	15%	11%	10%
Q	3/month	4/month	5/month	6/month	7/month
R	70%	72%	75%	77%	80%
S	7.5	7.6	7.7	7.8	8
T	8	8.5	9	9.5	10

3. 2 Index Weight Optimization

This paper optimizes the index system through the combination of computer vision algorithm and fuzzy mathematics perspective. Firstly, this paper uses image feature extraction technology to transform the financial indicators and market indicators of enterprises into multi-dimensional feature vectors. Then, dimension reduction technologies such as principal component analysis are used to further reduce the feature dimension. This paper then uses the fuzzy comprehensive evaluation method to calculate the weights of each index, and applies these weights to the process of feature selection and parameter adjustment of classifiers to improve the classification performance. For example, Figure 2 shows the changes of weight indicators before and after, Figure 2 (a) shows the changes of financial indicators, and Figure 2 (b) shows the changes of market indicators.

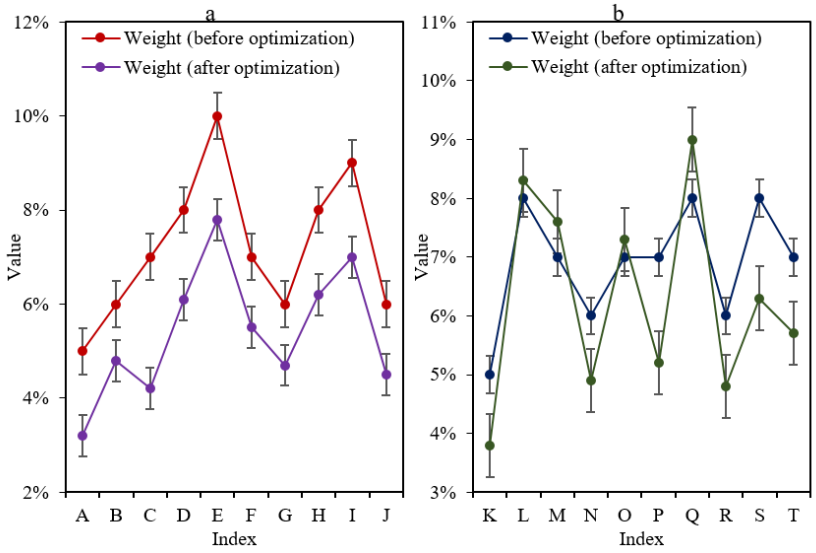

Figure 2 changes in weight indicators before and after

It can be seen that after the optimization of the index system, the weight of various financial indicators and market indicators has changed, the weight of some indicators has decreased, and the weight of some indicators has increased. For example, the weight of financial indicators such as return on total assets, net profit margin, return on capital and expense rate has declined. The weight

of market indicators such as customer satisfaction, dealer satisfaction, marketing and promotion cost rate and new product research and development speed has increased. Finally, it can get a more comprehensive, accurate and reliable financial evaluation index system, which can help enterprises better understand their financial situation and market performance. Through the optimization of the index system, enterprises can better identify their advantages and disadvantages, and take corresponding measures to improve them.

3. 3 index System Scoring

In order to better evaluate the financial index system of Z company, this paper evaluates the financial indicators of the four subsidiaries under the name of Z company from four aspects: cash flow, solvency, operation ability and growth ability. It was rated by four financial experts out of 10. These indicators are constructed from the perspective of computer vision algorithms and fuzzy mathematics.

Cash flow refers to the net amount of actual income and expenditure of an enterprise from operating activities, investment activities and financing activities within a certain period of time. Generally speaking, cash flow is the money in and out of the enterprise. The operation of enterprises requires continuous investment, financing and business activities, which would affect the cash flow of enterprises. Therefore, reasonable management of cash flow is very important for the healthy development of enterprises. Under normal circumstances, an enterprise should maintain positive cash flow, that is, cash inflow is greater than cash outflow. If the cash flow of an enterprise is not enough to meet its operational needs, it may face problems such as debt default, inability to pay employees' wages, and even bankruptcy. Solvency refers to the ability of enterprises or individuals to repay debts with their disposable cash flow and other assets. Typically, it is measured by calculating the ratio of debt to disposable cash flow or other assets. The higher the ratio, the better the solvency of enterprises or individuals. For example, Figure 3 shows the cash flow and solvency score, of which Figure 3 (a) is the cash flow score and Figure 3 (b) is the solvency score.

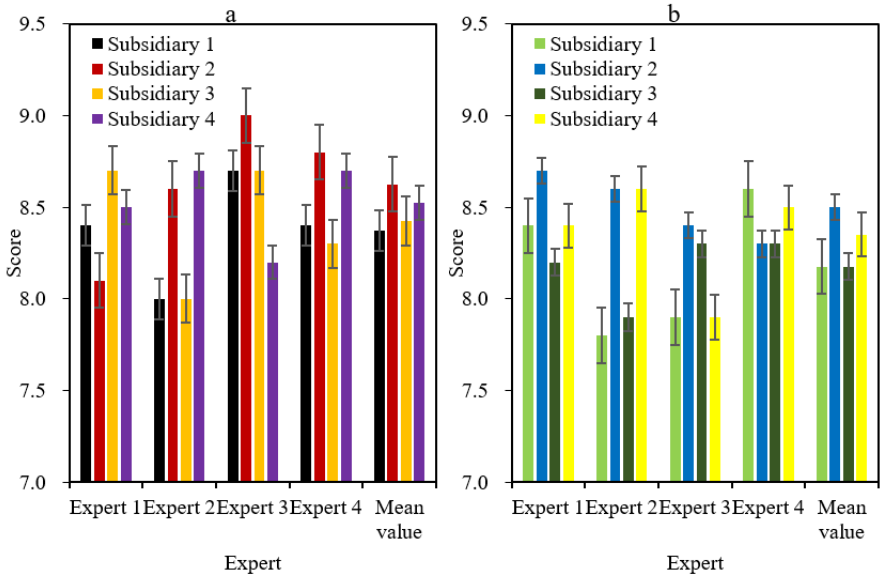

Figure 3 cash flow and solvency score

It can be seen that in terms of cash flow scoring, subsidiary 1 scored 8.4 and subsidiary 2 scored 8.6. Subsidiary 3 was rated 8.4, and subsidiary 4 was rated 8.5. In terms of solvency score, subsidiary 1 is rated 8.2 and subsidiary 2 is rated 8.5; Subsidiary 3 scored 8.2; Subsidiary 4 scored 8.4.

Operational capability usually refers to the ability of a person or organization to manage and execute business activities, including strategic planning, project management, teamwork, resource allocation, data analysis and so on. In the business world, operational capability is critical to a company's success, involving the day-to-day operations of the entire company and its ability to achieve strategic goals. Some successful entrepreneurs and companies are considered to have excellent operational capabilities, which enable them to adapt to market changes and maintain a competitive advantage. Figure 4 shows the rating of operational capacity.

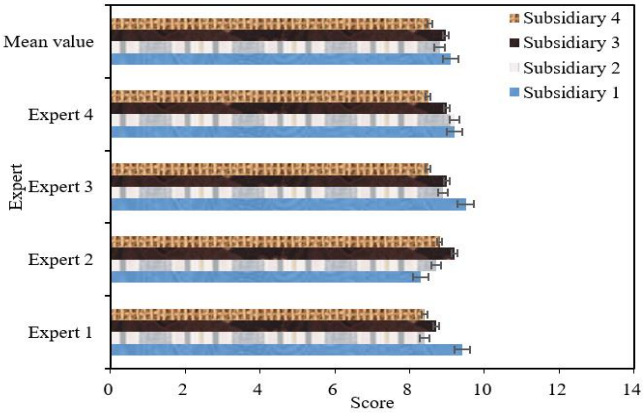

Figure 4 operational capability score

It can be seen that in terms of operational capability score, subsidiary 1 has a score of 9.1, subsidiary 2 has a score of 8.8, subsidiary 3 has a score of 9.0 and subsidiary 4 has a score of 8.6.

Growth ability refers to the ability of individuals or organizations to continuously improve and develop themselves in different aspects. It involves advances in knowledge, skills, attitudes and values that support higher levels of individual or organizational goals. Enterprise growth ability refers to the steady improvement of scale, efficiency and competitiveness through the improvement of its own ability and strategic adjustment in the changing market environment. For example, Figure 5 shows the growth ability score, Figure 5 (a) shows subsidiary 1 and subsidiary 2, and Figure 5 (b) shows subsidiary 3 and subsidiary 4.

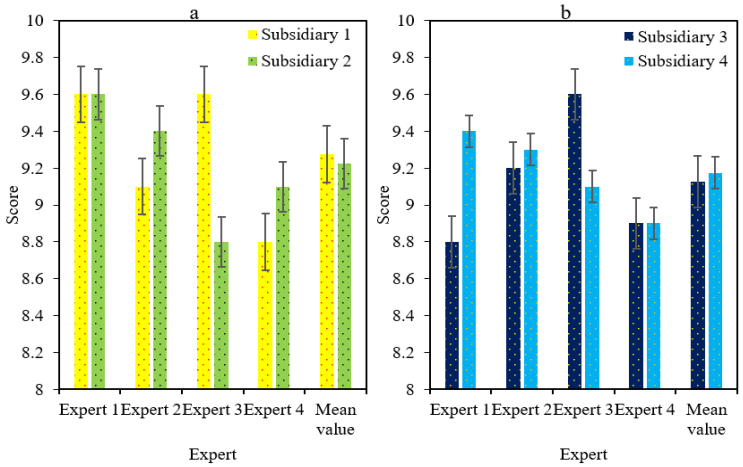

Figure 5 growth ability score

It can be seen that in terms of growth ability score, subsidiary 1 has a score of 9.3, subsidiary 2 has a score of 9.2, subsidiary 3 has a score of 9.1 and subsidiary 4 has a score of 9.2.

To sum up, the financial evaluation index system based on computer vision algorithm and fuzzy mathematics has good practical application value, and provides effective guidance and help for the financial management department of enterprises.

4. CONCLUSION

The financial evaluation index system is an important basis to reflect the financial situation of enterprises. In practical application, due to the limitations of its own conditions and external environment, the index system is difficult to fully reflect the financial situation of enterprises, thus affecting the production and operation of enterprises. Computer vision algorithms can effectively improve the efficiency and accuracy of financial data processing. Through automatic identification and extraction of indicators in financial statements and data visualization, data processing time can be greatly shortened and error rate can be reduced. Fuzzy mathematics method can effectively deal with the uncertainty in financial data and evaluate multiple financial indicators. Compared with the traditional financial index system, fuzzy mathematics method can provide more comprehensive, accurate and scientific evaluation results. In this paper, the comprehensive use of computer vision algorithm and fuzzy mathematics method can optimize the financial evaluation index system and improve the accuracy and practicality of the evaluation results. By automatically processing financial data and considering multiple financial indicators, it can evaluate the financial situation of enterprises more comprehensively and accurately, and help investors formulate more scientific investment strategies. The application of computer vision algorithm and fuzzy mathematics method is of great significance and value for optimizing the financial evaluation index system and improving the efficiency and accuracy of data processing.

REFERENCES

Alomary Fahad Omar. "Evaluation of Scientific Research Based on Key Performance Indicators (KPIs): A Case Study in Al-Imam Mohammad Ibn Saud Islamic University." Computer and Information Science 13.1 (2020): 34-40.

Ali Goharshenasan, Abbas Sheikh Aboumasoudi, Arash Shahin, Azarnoush Ansari. "Prioritizing the economic indicators of SSC: an integrative QFD approach of performance prism and BSC." Benchmarking: An International Journal 29.2 (2022): 522-550.

Iacuzzi Silvia. "An appraisal of financial indicators for local government: a structured literature review." Journal of Public Budgeting, Accounting & Financial Management 34.6 (2022): 69-94.

Kilci Esra N. "A study on financial sustainability of healthcare indicators for Turkey under the health transformation program." The International Journal of Health Planning and Management 36.4 (2021): 1287-1307.

Krasodomska Joanna, Ewelina Zarzycka. "Key performance indicators disclosure in the context of the EU directive: when does stakeholder pressure matter?." Meditari Accountancy Research 29.7 (2021): 1-30.

Majeed Manal Hameed, Amal Noori Mohammed, and Mokhalad Hamzah Jaddoa. "Evaluating the financial performance according to the traditional and modern financial indicators." Opcion 34.16 (2018): 1012-1587.

Mundra Sruti, and Motilal Bicchal. "Evaluating financial stress indicators: Evidence from Indian data." Journal of Financial Economic Policy 13.1 (2021): 116-135.

Nadir Ali, Zahid Ali Chanar, Saghir Pervaiz Ghauri, Shahid Obaid. "The Effects of Firm-Specific Factors on the Financial Soundness by using CARAMELS Framework Indicators: A Case of Non-Life Insurance Industry of Pakistan." International Journal of Experiential Learning & Case Studies 4.1 (2019): 131-156.

Narimissa Omid, Ali Kangarani-Farahani, Saber Molla-Alizadeh-Zavardehi. "Evaluation of sustainable supply chain management performance: Indicators." Sustainable Development 28.1 (2020): 118-131.

Peng Xindong, Haihui Huang. "Fuzzy decision making method based on CoCoSo with critic for financial risk evaluation." Technological and Economic Development of Economy 26.4 (2020): 695-724.

PRODANOVA N.A., TROFIMOVA L.B, KORSHUNOVA L.N, KAMOLOV S.G, TRAPAIDZE K.Z, PAVLYUK A.V. "The methods and evaluation of RIC integrated business indicators." International Journal of Innovative Technology and Exploring Engineering 8.10 (2019): 1889-1894.

Salman Nazari-Shirkouhi, Saeed Mousakhani, Mahdokht Tavakoli, Mohammad Reza Dalvand, Jonas Saparauskas, Jurgita Antucheviciene. "Importance-performance analysis based balanced scorecard for performance evaluation in higher education institutions: an integrated fuzzy approach." Journal of Business Economics and Management 21.3 (2020): 647-678.

Sangwa Narpat Ram, and Kuldip Singh Sangwan. "Development of an integrated performance measurement framework for lean organizations." Journal of Manufacturing Technology Management 29.1 (2018): 41-84.

Seyedi Seyed Ahmad, Mohammad Reza Abdoli. "Modeling and rating financial soundness indicators of commercial banks using confirmatory factor analysis and TOPSIS method." Iranian Journal of Finance 3.3 (2019): 107-136.

Zelhuda Shamsuddin, Suraya Mahmood, Puspa Liza Ghazali, Fauzilah Salleh, Farah Amalina Md Nawi. "Indicators for cooperative performance measurement." International Journal of Academic Research in Business and Social Sciences 8.12 (2018): 577-585.