Research Article
A Random Matrix Model of Business Administration Based on Business Process Orientation in Market Economic Environment

Qitao Liu

School of International Education, Xuchang University, Xuchang 461000, Henan, China

Correspondence should be addressed to Qitao Liu; 12007008@xcu.edu.cn

Received 28 May 2022; Revised 25 July 2022; Accepted 29 July 2022; Published 26 August 2022

Academic Editor: Ning Cao

Copyright © 2022 Qitao Liu. This is an open access article distributed under the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

The optimization of business management strategy is a research hotspot in the field of resource processing under the market economy environment. Based on the theory of business process orientation, this paper constructs a reactive power optimization method of random matrix for business management and verifies the correctness and effectiveness of the method through an example. The random matrix construction method of enterprise management network and the feature extraction method that can reflect the operating state of the system are optimized, and the conflict problem in the process of enterprise management resource competition is solved. In the process of OpenDSS/Matlab cosimulation, the business management network state data and random matrix index data are processed by means of statistical modeling and feature extraction, and the random Petri net technology is used to construct a continuous time random matrix. The experimental results show that, combined with the verification of the business management network simulation model of the transformed IEEE-37 node, the traditional optimization method takes 96.63 s, while the business process-oriented scene matching method takes 1.32 s, which shows that the business process-oriented method constructed in this paper takes 96.63 s. The business management random matrix has obvious advantages in optimizing the operation speed, which verifies the accuracy, feasibility, and rapidity of the method and effectively improves the performance of the system.

1. Introduction

After years of research and practice, the establishment of the current regional service-oriented market economic environment has achieved great results and rich experience [1]. However, as a brand-new market economic environment management mode, the construction of service-oriented market economy environment is still a complex project, which is affected and restricted by various factors [2]. There are some misunderstandings in the thinking of some people and deviations in specific operations are inevitable. For example, the transformation of market economic environment functions is not in place, and the phenomenon of offside, dislocation, and absence are still prominent [3], and the phenomenon of replacing services with management is still serious; the market economy environment and the people is inverted: the market economy environment provides low efficiency and low quality of public services [4]. Therefore, the establishment of a service-oriented market economic environment must be based on a macro-perspective [5] and a long-term perspective. It must grasp the essential characteristics of the service-oriented market economic environment, understand the profound connotation of the service-oriented market economic environment, and seek to build a service-oriented market economy through practice [6].

As an effective means of processing big data, random matrix theory is applied to the reactive power optimization analysis of business management network [7–9], which can realize the processing of multisource heterogeneous data and describe the business management network system through the correlation of data. Without assumptions and simplifications, the chance and uncertainty of the results can be avoided [10], the calculation difficulty can be reduced, and the analysis results can be obtained accurately and in real time, thereby accurately realizing the reactive power
optimization of the business management network [11]. In the context of the era of big data, using the historical data of the business process network to establish a random matrix model and analyze, it is of great significance and value to the research on reactive power optimization of complex business management networks [12]. If the collected information terminal data is not processed in time and iteratively optimized quickly, the reactive power optimization scheme of the system at the current moment cannot be obtained [13]. Such a problem is more prominent in large-scale business management network systems, and the power optimization scheme lags behind the actual system state, which will lead to increased network loss of the system, poor business process quality, and affect the safe and stable operation of the system [14–16]. Therefore, how to effectively use and process these data, research faster reactive power optimization algorithms to achieve reactive power optimization accurately and in a timely manner, and ensure the safe and stable operation of business processes are important issues that business process systems need to solve in the current business process big data era [17].

To sum up, this paper conducts research on reactive power optimization of business management network based on random matrix theory, and uses random matrix theories such as single-ring theorem and eigenroot spectrum analysis to analyze and process the big data of business management network. The life cycle theory and the business process change theory are fully used in the functional design of the platform. This paper firstly makes a diagnosis and analysis of the application status of random matrix index effect management in supply point enterprises and proposes a business process-oriented random matrix index effect management model. The linkage mechanism between process management and stochastic matrix index effect management, and the corresponding stochastic matrix index effect management characteristics are analyzed; at the same time, the basic work required for the formation of the process-oriented stochastic matrix index effect management mode is expounded; based on the supply point enterprise, the construction process of the random matrix index effect index system based on business process is discussed. From the point of view of business process, this paper provides some new ideas for enterprises to build a key random matrix index effect index system and implement random matrix index effect management, which has important strategic significance for enterprises, and provides supply points for enterprises to deal with the rapidly changing market.

2. Related Work

At present, the increasing demand for business processes leads to the increasing scale of business processes and the increasingly complex network topology. The objective function and constraints in the reactive power optimization model are highly nonlinear. The machine-end business process is a continuous variable, while the input quantity of the business process and the gears of the business process node taps are discrete variables, so the reactive power optimization is a nonlinear complex mixed integer optimization problem with multiple variables [18].

Yasmin et al. [19] found that the administration of industry and commerce, as a state’s supervision and management of the market, would not have such management activities when there was no state in human society. The activities of industrial and commercial administration can be traced back to the slave society at the earliest. Since then, it has continued to develop and change with the development of the economy and changes in the state power and social system. Kasych et al. [20] recorded that when the regional slave system flourished, there were already corresponding policies and relatively complete management measures in the supervision and management of the market. However, the regional market supervision in ancient times was the management of simple commodity economy, and it was a kind of inhibitory management. Akenroye et al. [21] analyzed that the disadvantage of the multiobjective model is that the cost of optimizing one index is to sacrifice another index, resulting in a certain conflict between the objectives. Therefore, it is necessary to comprehensively consider the multiobjective function according to the actual needs. Abadia et al. [22] believe that multiobjective optimization is generally a weighted process for each single objective, and each objective is multiplied by the weight specified by the decision maker to form a single-objective evaluation function, which is then solved by the reactive power optimization algorithm. Compared with the inaccurate weight coefficients and normalization problems of the objective function in the traditional algorithm, the artificial intelligence algorithm has developed rapidly because of its stronger applicability to multi-objective optimization problems.

The market economic environment has more stringent and comprehensive supervision on corporate market behavior than the United Kingdom and the United States, and has a very complete supervision and enforcement system [23]. The main institutions for economic management of the German market economy environment are the Federal Ministry of Finance and the Federal Ministry of Economics. The Federal Ministry of Finance is responsible for the management of national assets and the management of finance and taxation, and carries out macrocontrol over the market behavior of enterprises through fiscal and taxation means [24]. The Federal Ministry of Economic Affairs formulates the overall federal economic policy in accordance with the principles of social market economy, and deals with major economic issues involving the whole country, such as economic prosperity and competition policy, foreign economic relations, promoting the development of small and medium-sized enterprises, and balancing the differences in the economic development of the federal regions. In this model, the market economy environment has formulated a meticulous legal system to regulate market behavior; the third model is the market economy environment-dominated model represented by Japan. In this model, the market economy environment has a high degree of intervention.
3. Construction of a Random Matrix Model of Business Management

3.1. Structural Risks of Market Economy. Market economic structure risk minimization divides the function set into various function subsets, arranges them in order according to the size of the VC dimension, finds the minimum empirical risk in each subset, and achieves the minimum practical risk by compromising the empirical risk and the confidence risk. By designing a certain structure of the function set, we can ensure that each subset can achieve the minimum empirical risk. According to the principle of minimum confidence risk, the subset is further appropriately selected, and then the function that can achieve the minimum empirical risk in this subset is our optimal function to be found.

\[
\text{inert}(a, b) = \begin{cases} 
\frac{|t(a, b) - t(b, a)|}{s_i - t_i} - 1, \\
\frac{|s(a, b) - s(b, a)|}{t_i - s_i} 
\end{cases} 
\]

(1)

\[
\angle s(a, b) - t(a, b) = \angle \text{fin}(a, b) - \text{tin}(a, b). 
\]

(2)

Through a flat flowchart of enterprise business activities, using the description and transformation of the Petri net model, it shows four kinds of relationships, including selection, conflict, synchronization, and concurrency among various activities within the enterprise, and illustrates the relationship between the four kinds of relationships and the business process and concurrency of the enterprise. The corresponding relationship and significance of reorganization, based on the value chain to solve the problem of selection relationship, and further describe, analyze, and implement the reorganization algorithm of the correlation matrix, laying the foundation for the optimization, reorganization, and system performance analysis of the enterprise business process. In the first step, the expert survey constructs the comparative discrimination matrix at each level and establishes the expert questionnaire and evaluation weight. Determine the weight of each indicator, use the survey table to consult the opinions of the enterprise leadership, the heads of core business departments and industry experts, fill in the pairwise comparison judgment matrix, apply the group decision-making method in AHP to determine the weight, and make full use of experience and experts knowledge, avoid systematic errors of judgment, and reduce the impact of individual errors of judgment.

![Figure 1: Market economy structure topology.](image-url)
important, and absolutely important, respectively. Scale 2, 4, 6, and 8, respectively, represent the compromise scale between the above two adjacent scales.

When the training samples are limited, the higher VC dimension of the learning machine will make the confidence risk larger, which will eventually lead to a larger and larger difference between the real risk and the empirical risk. The machine learning process requires the minimum empirical difference between the real risk and the empirical risk. If the risk larger, which will eventually lead to a larger and larger dimension of the learning machine will make the confidence as possible to ensure a reasonable confidence risk. Only in this way can the actual risk be small, that is, it has better generalization for future sample applications. For nonlinear regression problems, the low-dimensional space can be mapped to a high-dimensional space first, and then the linear regression can be solved in the high-dimensional space, and the nonlinear regression function corresponding to the low-dimensional space can be obtained.

\[
\begin{align*}
\text{inet}(a - i, b - i) \leq s(a - i, b - i) &= \frac{\text{inet}(a, b)}{i - a - b}, \\
\text{inet}(a, b) \leq s(a, b) &= \text{inet}(a, b),
\end{align*}
\]

The random matrix index effect standard is the judgment basis for measuring the completion of the random matrix index effect target. After the company-level key random matrix index effect indicators are decomposed into various departments, it is necessary to determine the random matrix index effect standard according to the target value and completion status of each indicator. The second step calculates the relative weight of each level and the relative weight of each indicator. The relative weights of the compared levels or elements are calculated from the judgment matrix. The characteristic root method of group decision-making is used in combination with the weighted average comprehensive judgment matrix method and the weighted average comprehensive sorting vector method.

3.2. Business Process Orientation Hierarchy. The business process node tap gears (±16 gears, the business process network range is 0.9 ~ 1.1) connected by the business process-oriented head-end, the business process group C1 connected by 708 nodes, the business process group C2 connected to the 737 node, and the SVC connected to the 711 node are the control variables. The above improved discrete random matrix algorithm is used for optimization and some parameters are set as: the population size is 50, the maximum number of iterations is 70, the inertia factor ranges from 0.4 to 0.9, and the learning factor is 2. First, in the supervision mechanism, gradually realize the transformation from the supervision of administrative divisions to the supervision of economic regions; second, in the field of supervision, gradually realize the transformation from a single bazaar to a large modern market; third, in the way of supervision In terms of supervision methods, it has gradually realized the transformation from extensive to intensive mode; fourth, in terms of supervision methods, it has gradually realized the transformation from labor-based to intellectual-based.

The reactive power optimization method of business management network based on random matrix studied in this section involves the prediction of multiple variables in Table 1, but it is essentially a nonlinear function regression problem. We take the control strategy to be predicted as the output value of the regression function, and take the corresponding state information that affects the control strategy as the input value of the regression function. Constructing effective input features can significantly improve the optimization effect of reactive power optimization methods based on random matrix models.
The cost management module of the platform allows employees to quickly understand the cost composition of materials and use the comparative analysis and query function to better understand the market price of each raw material. Due to the randomness of business processes, the operation data of the business management network also presents random distribution characteristics. Therefore, this section will use the system features including business process load and other data extracted based on random matrix theory as the input feature set of the random matrix model.

\[
|t(a,b) - t(b,a)| < |s(a,b) - s(b,a)| < |a - b - s|, \\
\angle s(a,b) - a < a/b, \angle s(a,b) - b < 1. 
\]

The first step is to demonstrate the current state of the core business process by listing the core business process survey list. In addition to the function of displaying the current status of the core business process, it can also be used in the later process improvement. It is actually a detailed textual description of the current status of the core business process.

\[
R(\text{line}, a) \begin{bmatrix} \text{line (am)} \\ \text{line (bm)} \end{bmatrix} + \frac{1}{2} \text{ inver (m)} - \text{ inver (n)} \\
S(\text{line}, b) \begin{bmatrix} \text{line (cm)} \end{bmatrix} \\
T(\text{line}, c) \begin{bmatrix} \text{line (bm)} \end{bmatrix} \\
\text{inver (m - n)} < \text{ inver (m)} - \text{ inver (n)}, \exists \text{ abs (m)} + \text{ abs (n)} < 1.
\]

In general, the random matrix index effect standard is divided into three grades: excellent (1.2), qualified (1.0), and unqualified (0.8 or 0). When the target value of the indicator is reached, the coefficient is 1.0; if the completion of the indicator exceeds the target value specified in the random matrix index effect standard, and this surpassing is meaningful for the whole company, the coefficient is 1.2; if the target value specified by the index is not completed, the coefficient is 0.8: the lower limit of the scoring standard interval corresponding to the coefficient of 0.8 is defined as the “warning line”, that is, once the minimum requirement is exceeded, the coefficient is 0. The second step is to sort out the collected process attachments and connect them with the description of the current state of the core business process. In the core business process information, it mainly includes the following process attachments: forms for recording information, delivery orders for work undertakings, operating specifications, related systems, and summary reports.

\[
\begin{align*}
&\{ |u_i - v_i| \leq t_i - s_i, \quad |u_i - v_i| \leq t_i - s_i \} = 0, \\
&\{ \angle r_i - s_i \leq |u_i - v_i| \leq \text{ enmercy (u,v)} \} < 1, \\
&\text{lameda (x, y)} = \sum_{i=1}^{n} x(a,b) - \frac{|a_i - s_i|}{|a_i - s_i|}, \\
&\quad - \sum_{i=1}^{n} x(b,a) - \frac{|b_i + s_i|}{|b_i + s_i|}.
\end{align*}
\]

With reference to the responsibilities of the department, the correlation coefficient of the department index assessment will be determined according to the different responsibilities of the department when it undertakes the key random matrix index effect indicators. In order to facilitate the operation, it can generally be divided into several categories and assigned different values. According to the size of responsibility, it is divided into the following two categories: P1 = 1.0; P2 = 1.2. The third step summarizes the process analysis table, showing the current status of the core business process. Based on the information learned and collected during the investigation, identify the problems existing in the process and the advantages and disadvantages of their operation and initially formulate improvement measures. During the actual operation, the evaluator can make a preliminary description of the input and output, internal nodes, and other issues of the process according to the process activity analysis table.

\[
\text{miernin (x, y)} = \sum_{i=1}^{n} x(a,b) \left[ \frac{u(a) + u(b)}{u(a) - u(b)} \right], \\
\quad - \sum_{i=1}^{n} x(b,a) [\sqrt{u(a) + u(b)}], \\
\angle s(a,b) - \sin (a,b) - \cos (a,b) \\
\quad \cup [\angle f in (a,b) - \text{tin (a,b)}] \subseteq C (a,b).
\]
information collection system, including empty data points, zero data points, abnormal step values, and continuous constant values. If these bad data are not preprocessed, the final research results will be seriously affected. By averaging the business process load data before and after the bad business process load point, the point of business process load data is compared. According to the characteristic that the business process load curves of adjacent days in the business process system are basically the same, this paper adopts a vertical method to deal with the continuous bad business process load data and finds similar business process load curves from adjacent days to replace. Taking the empty business process load data point as an example, the results after using the horizontal comparison method are shown.

3.3. Analysis of Business Management Structure. Based on the one-hour scenario business management framework, a new method of reactive power optimization is explored. According to the random matrix theory, the established matrix must meet the requirement that the number of columns is greater than the number of rows. The interpolation method can be used to fill the time series data with large intervals. The sampling interval of the original business process load data is 15 minutes, and the sampling interval of the original random matrix index data is 1 hour.

The key random matrix index effect index is to select the key ports of input and output of the process activities in Figure 2, and set standard parameters for supervision and control. Using it can implement the company’s strategic goal plan, transmit the company’s value orientation, and guide employees and organizations to work for the company’s common strategic goals. KPI can be divided into company-level I (PI), department-level KPI, and employee-level time I according to their evaluation entities.

In the process of Figure 3, a role is an active, relatively independent abstract unit with certain goals that can complete a series of operations in sequence. A role has elements such as activities, resources, and states, where activities are the tasks performed by the participants in the role, and resources are the equipment, raw materials, and information required for the role’s activities. In the target process analysis, we establish a role-oriented process model, define the responsibilities, qualifications, and permissions that the role needs to undertake when completing the
corresponding workflow, give the role corresponding resources, and specify the role bearer needs to have contents that require other roles to interact and collaborate during the completion process.

3.4. Random Matrix Feature Extraction. In the random matrix characteristic process load model, the business process will change at each iteration, and the resulting flow of business process load points will also change. When the condition of the business process restriction is not met, in order to ensure the convergence, the model will be treated as a constant impedance business process load model. The business management network model has 37 nodes and 35 branches for the business process load parameters of each node. Through the analysis of enterprise operation data and information, new process operation rules are accumulated and transformed into enterprise knowledge precipitation. At the same time, the level of process operation is the evaluation annotation for the effect of enterprise process knowledge application. Figure 4 obtained the best parameters for training and regression prediction.

It can select any day in the second year of the business management network as the day to be optimized, and perform reactive power optimization for the scenarios corresponding to the 24 hourly moments. Firstly, based on random matrix theory, feature extraction is performed, and 9 features corresponding to each scene to be optimized are calculated respectively. The corresponding control strategy is used as its reactive power optimization strategy to achieve reactive power optimization. The system business process load matching accuracy at each moment is high, reaching more than 90%, and even more than 95% at most times,
indicating that the business process at this time. The load matching effect is relatively good, and the similarity matching of the scene can be effectively achieved, which proves the feasibility and effectiveness of the scene matching method proposed in this paper.

In addition, in different Petri net performance models, there are two rules for the implementation steps of Figure 5. Generally, when an implementable transition passes the delay time, it has only one step to clear the input position mark, and at the same time, the mark moves into the output location.

In fact, the fundamental difference between an organization that conducts performance appraisal centered on the process and an organization that uses traditional methods to conduct appraisal is not the difference in the organizational structure and business process of the enterprise, but the difference in the angle of appraisal. If each transition is associated with an exponentially distributed random variable, then the delay retention time of the system state is also an exponentially distributed random variable. Different implementation rules have different effects on the state space composition of the system.

4. Application and Analysis of Business Management Stochastic Matrix Model

4.1. Realization of Random Matrix Simulation of Business Administration. In order to simulate the operation of the actual business management network and the reactive power optimization control strategy, first, an appropriate business management network model should be built according to the actual topology structure and operating parameters of the business process. OpenDSS (Open Distribution System Simulator) software can not only quickly simulate the business management network but also access distributed point sources and energy storage systems, etc., and can realize the modeling and simulation of the business management network with distributed point sources. Therefore, this paper uses OpenDSS to model the IEEE-37 node business management network with distributed point sources and moving nodes in Figure 6.

In this paper, OpenDSS software is used for modeling and simulation of business management network, and Matlab software is used to solve the reactive power optimization model of business management network based on improved discrete random matrix algorithm, and the information exchange between the two platforms is realized through COM interface. Among them, OpenDSS is used as an independent power-flow calculation module, the COM interface in Matlab is used to start the running simulation of OpenDSS, and the results of power-flow calculation (network loss, node business process) are returned to the objective function and constraints in Matlab. The above process is repeated until the end of the optimization and the optimal control strategy is generated. The goods should be stable and the price should be reasonable. For engineering changes, it is necessary to “pass through and release”, that is, if the market demand changes, M company changes the drawings, informs the supplier to make changes and sends

![Figure 6: Node distribution of business administration random matrix.](image)

Table 2: Random matrix index effect index algorithm.

<table>
<thead>
<tr>
<th>Random matrix index code</th>
<th>Effect index algorithm text</th>
</tr>
</thead>
<tbody>
<tr>
<td>Double dataset [maxrow] [maxcol];</td>
<td>The differences between $a - i$</td>
</tr>
<tr>
<td>Char labels [maxrow];</td>
<td>Index effect plan $s(a,b) - s(b,a)$</td>
</tr>
<tr>
<td>Double testdata [maxcol];</td>
<td>The degree of similarity $\angle s(a,b)$</td>
</tr>
<tr>
<td>Map &lt;int, double&gt; map_index_dis;</td>
<td>On the basis of $\angle s(a,b)$</td>
</tr>
<tr>
<td>Map &lt;char, int&gt; map_label;</td>
<td>Scene matching method $s(a,b)$</td>
</tr>
<tr>
<td>Double get_distance (double * dt1, double * dt2);</td>
<td>Match the most similar $x(a,b)$</td>
</tr>
<tr>
<td>Vec_index_dis (map_index_dis.begin ());</td>
<td>To the system $cфин(a,b) - a$</td>
</tr>
<tr>
<td>Sort (vec_index_dis.begin (), vec_index_dis.end ());</td>
<td>To be optimized $t_i - s_i$</td>
</tr>
<tr>
<td>Cout &lt;&lt; &quot;&lt;k&quot; &lt;&lt; &quot;&lt;endl;</td>
<td>The extracted feature</td>
</tr>
<tr>
<td>Vector &lt;pair &lt;int, double&gt;&gt;</td>
<td></td>
</tr>
</tbody>
</table>

samples again for confirmation, and regulates the management and control of processes and systems.

In order to match the most similar scene to the system to be optimized from the business management network history database, the degree of similarity between the scene to be optimized and the historical scene can be measured by extracting multiple features in Table 2. At the same time, it should be noted that the importance of each feature to the reactive power optimization model of the business management network is different. Considering the extracted features and their different degrees of importance, this paper proposes an indicator of overall deviation to compare the differences between scenes from multiple dimensions and provide a metric for the similarity matching of scenes. The experimental results show that the traditional optimization method takes 96.63 s, while the RM scene matching method takes 1.32 s, which shows that the RM scene matching method proposed in this section is effective in it. There are obvious advantages in optimizing operation speed. In
summary, after adopting the reactive power optimization method proposed in this section, the line loss of the system and the deviation of the node business process are reduced, which is similar to the optimization effect of the traditional method, and the operation performance of the business management network is optimized. At the same time, the method has the advantage of not relying on the business management network model and parameters, and can quickly make control decisions, which can meet the needs of practical projects.

4.2. Example Application and Analysis. In the timeless Petri net model, the choice of two transition implementations is completely uncertain, which transition implementation is possible, and the implementation of one transition makes the other transition unimplementable. In stochastic Petri nets, two transition conflict solutions are related to their associated delays, and conflict solutions are obtained through competitive strategies. In this paper, 7 kinds of data are selected to construct random matrices, respectively, and the average spectral radius, maximum/minimum spectral radius, eigenvalue ratio of inner/upper/outer ring, second-order central moment, and the modulus; there are 9 statistical indicators such as variance. Since the total business process load of the system at this moment can reflect some scene characteristics, plus the total business process load, a total of 64 characteristic indicators are extracted at this moment.

In the status management, it is necessary to record the ins and outs of each engineering change in detail, and register clearly whether it is the engineering change proposed by the demander or the supplier, what is the reason, where the changes have been made, before and after the change, the performance difference, the possible impact, or consequence of the change. The method generates the historical optimization strategy based on the improved discrete random matrix algorithm, and is used as the comparison benchmark for the optimization effect of the method proposed in Figure 7 to verify its correctness and effectiveness.

The 8 sub-Petri nets express that the internal activities of the enterprise can be composed of 8 relatively independent activity sets with certain goals. As a BPR process, all resources or conditions, activities, or events within the enterprise must be integrated. It can be known from the Petri net that constructs the internal activities of the enterprise: Pi represents the resources or conditions available to the enterprise, and it represents the activities or events of the enterprise. According to the four relationships expressed, we can find the synchronization and conflict relationship between subnets from the above eight subnets. In actual calculation, the Relief weight of each feature is generally linearly transformed into the range of [0, 1]. The larger the weight, the stronger the ability of the corresponding feature to distinguish close-range samples, the greater the contribution of the feature to the model under study, and the threshold THT1 can also be set to further analyze the features with a weight greater than this threshold.

At the same time, the value of k cannot be too large or too small. When the value of k is too large, the amount of calculation will increase, the efficiency of Figure 8 will decrease, and some irrelevant features may also be selected; when the value of k is too large, it may happen that some irrelevant features are selected. It has been verified that the effect is better when \( k = \text{Round} \left( \frac{n}{100} \right) \), where Round() is the rounding function. The correlation matrix of the model is used as the basis for the reorganization of the internal operation activities of the enterprise, so as to show the relationship between the active sets.

Experiments show that most of the irrelevant feature indicators can be eliminated based on the improved Relief algorithm, but since there is no ability to eliminate redundant features in Figure 9, the selected features still have a certain degree of redundancy. Therefore, this paper applies Pearson correlation analysis to the elimination of redundant features; it describes the strength of the linear correlation between two eigenvectors. When \( p > 0 \), the two are positively correlated; when \( p < 0 \), the two are negatively correlated. When \( p = 0 \), there is no linear correlation between the two
eigenvectors. When \( p = 1 \) or \(-1\), it means that the two eigenvectors have a complete linear positive or negative correlation. The larger the absolute value of \( p \), the stronger the correlation between the two feature vectors, and the more similar information they contain.

The performance appraisal indicators are determined according to the specific links and roles assumed by the examinees in the process activities. For the indicator of “reduction of procurement costs”, according to the process of procurement in the enterprise, it is found that the livelihood planning arrangements of the production management department, and the supplier selection and management capabilities of the supplier management department directly affect the quality of procurement. This sufficient condition is weakly conservative because it depends on the switching mode and network delay at the same time. The control law for the adaptive synchronization of the system can be obtained by solving the LMI in this sufficient condition.

In stochastic Petri nets, the time-delayed random variables are divided into discrete and continuous cases. Various distributions of Figure 10 can be defined for these two random variables. Affected by the noise, the MESCM started to show an obvious upward trend from the sampling time, which was delayed 78 sampling times after the occurrence of the fault event in this local area. At the sampling time, the MESCM crossed the threshold and issued an abnormal state alarm. It can be seen that the random matrix feature drops to the minimum value of 0.79 at the sampling time, which is still larger than its inner diameter, and it is difficult to achieve effective detection. The spectral distribution shows that 200 eigenvalue points still converge within the double loop, indicating that the random matrix eigenanalysis method is susceptible to noise and fails. That is, a subnet expresses a set of activities that can run independently and achieve certain goals within the enterprise. In the process of achieving the goal, as a set of different activities (subnets) within the enterprise, once there is a conflict between the subnets, it indicates that when carrying out activities, there will be competition in the use of resources or consumption of resources; once there is synchronization between the two networks, it means that they are not completely independent when they carry out activities but have a mutual dependence relationship, which may be manifested in the resource dependent or conditional dependency.

5. Conclusion

In this paper, a business process-oriented business management stochastic matrix model is constructed, and on this basis, stochastic Petri net theory and analysis techniques are introduced. Considering that the reactive power control and network reconfiguration of the management network are the two main measures for the optimal operation of the system, the comprehensive optimization method based on random matrix network considering reconstruction is proposed. First, the topology of the current business management network is determined, and then the reactive power is optimized, and the rapidity, feasibility, and effectiveness of the method are verified by several examples. In the high signal-to-noise ratio environment, with the occurrence of events, the random matrix feature deviates from the inner diameter and drops to the lowest value of 0.625, which proves the effectiveness of the method. In the low SNR environment, the random matrix feature drops to the lowest value of 0.767.

Then, in order to further improve the effect of reactive power control, the problem of reactive power optimization is analyzed from the perspective of function mapping, the theory of support vector machine algorithm is introduced, and the regression model from system characteristics to reactive power control strategy is established by applying random matrix. The reactive power optimization method of business
management network based on matrix and support vector machine is verified, and the method can quickly give a reasonable and effective control strategy through an example.

**Data Availability**

The data used to support the findings of this study are available from the corresponding author upon request.

**Conflicts of Interest**

The authors declare that they have no conflicts of interest.

**Acknowledgments**

This work was supported by the project of Humanities and Social Sciences Research and Planning Fund of the Ministry of Education “Research on Business Performance Evaluation and Mechanism Optimization of Household Farm Development under the Background of Rural Revitalization Strategy” (19YJJA790058), and Henan Philosophy and Social Sciences Planning Project “Research on the Development Model and Countermeasures of Ecological Agriculture in Henan Province under the Background of Rural Revitalization Strategy” (2019BJJ054).

**References**


