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The COSO Internal Control Framework of Enterprise Big Data Technology Application Research—Take Zhengbang Company for Example

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Abstract: With the continuous development of information systems, "big data" has been widely used in social production, economy, financial accounting and daily life, which has greatly improved social production efficiency and created huge social value. In the field of enterprise internal control and risk management, big data has brought great changes to the management mode and business philosophy of enterprises. Enterprises use big data to optimize systems, innovate internal control methods and strengthen risk management in order to cope with the increasingly complex market environment and adapt to the new competitive situation. From the perspective of internal control and risk management, this paper analyzes the internal control system of Zhengbang Company in depth based on COSO internal control framework and puts forward some optimization suggestions.

1. Introduction

Since the COSO Committee of the United States issued the COSO Internal Control Integration Framework in 1992, after many revisions, it has been widely used in many listed companies around the world and become an executable means of corporate risk prevention. According to the current situation and development of various enterprises in China, the basic Norms for Internal Control of Enterprises in China in 2008 analyzed the characteristics of the five elements of COSO framework in 1992 and the eight elements in 2004, and put forward the internal control framework suitable for China's national conditions, including control environment, risk assessment, control activities, information and communication and supervision. In order to form the internal control system, so as to effectively reduce the possibility and harm of the enterprise before, during and after the occurrence of potential risks. It can be seen that risk management is the process and specific form of internal control, and internal control is applied between various management departments and functional departments of an enterprise to serve the goal of the enterprise. In addition, the results suggest that internal control, as an integrated system, has significant positive impact on firm innovation [1]. In the context of the new era, companies have begun to strengthen internal management, and management needs to start with internal accounting control. The internal control of corporate accounting is related to the security of financial information and will directly affect the development of the enterprise [2]. And the management personnel carry out scientific and efficient

internal management during the operation of the enterprise, which can not only optimize the internal development structure of the enterprise, but also enhance the core competitiveness of the enterprise itself [3]. The managing hierarchy should establish correct internal managing notion and clear responsibility of all departments. Not only that, administrators will fulfill critical work on internal control and management working to achieve enterprise's value maximization [4].

In 2019, The State Council issued the Implementation Opinions on Strengthening the Construction and Supervision of the Internal Control System of Central Enterprises, pointing out that informational is an important means to strengthen the rigid constraints of internal control, promote the embedding of internal control measures into business information systems, and comprehensively improve the effectiveness of the internal control system of enterprises. Enterprise internal control under the background of big data will be a new way to optimize enterprise risk management, and the upgrading of enterprise internal control system with big data means has become the main task of enterprise risk management in the future. The internal control of an enterprise, as the basis of all the management mechanisms of the enterprise and an important means for determining whether an enterprise can survive and develop in the fierce market competition, has also ushered in a revolution because of big data [5].In this context, it is particularly important to innovate financial management models, build a sound internal control mechanism, improve financial management levels, and reduce corporate risks [6].

In this paper, case study method is used to optimize and upgrade zhengbang Group's internal control and risk management system based on COSO internal control framework under the background of big data technology. Under the background of big data technology, Zhengbang Group optimizes its internal control framework and upgrades it in five aspects: control environment, risk assessment, control activities, information and communication and supervision, which effectively reduces the probability of risk occurrence and the risk of harm. At the same time, according to the internal control optimization experience of Zhengbang Group, it provides certain reference for other agricultural enterprises, and also provides reference experience for the application of big data technology in internal control.

2. Internal Control Status of Zhengbang Group Based on COSO Framework

2.1 Internal Environment

Zhengbang Group has formulated the ten strategic goals of "realizing the market value of 200 billion yuan, advancing into the world's top 500 companies, realizing the production capacity layout of 100 million pigs, 100,000 employees, 5 million breeding pigs, 20 million tons of feed, 100 billion yuan of assets of Yumin Bank, 10 billion yuan of meat food, 600 million broilers, 10 billion yuan of output value of plant protection". But a series of strategy the company are in the second half of 2019 swine fever and the state environmental protection policy, after a sharp increase in the prices, in 2021, these factors effect weakened after prices gradually returned to normal range, the company strategic objectives and now there is a big gap between market demand, and because prices stimulate and lead to the expansion of the company on a large scale, Wantonly diversification strategy, the company's overall governance system and governance capacity has not been adjusted and followed up. Therefore, zhengbang Group's current strategic goals have been divorced from the actual situation, and the company will face a sharp increase in potential risks.

2.2 Control Activities

2.2.1 Data Systems are Isolated

Zhengbang Group's main competitors such as Twin and Muyuan are speeding up the construction of big data system. In order to cope with the impact of competitors, zhengbang Group has intensified efforts to build big data system in recent years. At present there are including generic micro enterprise OA office systems, iHR MeiZhiyun systems, kingdee cloud sky, OTB platform, BI data module, the eight enterprise APP, VR pig system and set up cooperation with Huawei cloud "pig-breeding digital platform", almost covers the enterprise production, finance, management, office, human resources, logistics and so on all aspects of daily activities. However, it seems that Zhengbang Group has a complete set of big data application system, but it does not get through the connection between various data platforms. Instead, it builds a big data platform chain composed of several systems for a certain business. Therefore, in each big data platform chain between the lack of a command center and the data platform chain can't fit together, in their own way as powerful individuals, unable to maximize their benefits, although work easier than ever before, but considering the cost and other resources input, data platform marginal benefit from the lower instead.

2.2.2 Logistics System Positioning Lacks Refinement

Zhengbang Group has developed rapidly in recent years and its factory area has been expanding continuously. It has 22 areas including Heilongjiang, Hebei, Sichuan, Jiangxi, Guangxi, etc., with factories and more than 4000 domestic households, 58 feed factories and more than 1400 transport lines, which is huge in scale. Although the enterprise has carried out information construction on the logistics platform, due to the wide span and large business, the enterprise still has problems in warehousing, handover, in-transit control and other logistics, and it is easy to have loopholes in control activities. Is different from offices in farms, headquarters to be able to communicate through the information technology innovation, office system for office departments such as real-time collection, feedback, and information processing, and across the country have farms belong to the grassroots work, because industry characteristics, is bond intensity of choice in the mountains, rural and remote areas, Transportation, information technology and personnel quality are all defective, it is difficult to achieve unified management.

2.3 Risk Assessment

2.3.1 Fraud Risk and Brain Drain Risk

Although Zhengbang Group has formulated a series of human resource development plans and a standard framework for staff promotion and incentive, the performance appraisal index does not quantify the weight of performance indicators, the index design is still superficial, the weight of qualitative evaluation is too high, and the subjectivity in the appraisal process is serious. Secondly, in the business system of the company, there will be some post adjustment and rotation of ordinary business personnel, but there is no regular rotation of important posts and main responsible personnel, which increases the potential fraud risk and increases the consumption of human, material and financial resources of the internal audit department and the risk control center. The turnover rate of grass-roots staff is high and the sense of belonging is not strong. Because the pig factory environment is hard, and seal factory, recently hired new employees even if they don't engage in a line of farming activities, may also be difficult to adapt to the enclosed environment,

group internal employees at the grass-roots level and flow quantity is too large, from a certain extent and claimed the group cohesion is not strong, personnel is not stable, will cause certain negative influence to the enterprise image.

2.3.2 Environmental Penalty Risk

The dead pigs were buried in the outside of the pig factory, which damaged consumers and made the pathogenic microorganisms have the possibility of secondary transmission, and formed a potential hidden trouble for pig breeding in the pig factory. The destruction of the impervious membrane in the temporary storage tank of sewage makes the sewage discharged into the local river without treatment or not in compliance with the treatment, causing serious harm to the ecological environment around the pig factory, etc., which will lead to serious punishment problems.

2.4 Information and Communication

2.4.1 Fraud Identification Means Single

Although Zhengbang Group has built its own big data platform to integrate data through the system, some achievements have been made. But its find fraud means mainly through the traditional way (by reporting, management review, etc.), and is state between the group head office and branch, branch and branch use a set of system, while in the field due to factors, such as its own characteristics in the process of implementing branch often creates suits own a set of system, As a result, in the final data collection and integration, several different systems lead to problems such as increased difficulty in data processing, inaccurate data results, and increased difficulty for auditors and other relevant departments to obtain information, which makes IT difficult for the risk control center to rely on internal audit and IT control methods to find fraud risks.

2.4.2 Poor Internal and External Communication

In recent years, Zhengbang Group's business has developed too fast. In grassroots areas such as towns and villages, the information level is low and there is no digital audit construction. Therefore, some problems arise from bottom to top: the audit plan module in the audit system is not perfect, and the system to improve the audit scheme for some abnormal data is not mature. At present, multi-level control is difficult in the implementation of internal audit and personnel audit of relevant departments, which makes it difficult to continuously audit and timely reflect existing problems.

2.5 Supervision

The first line of defense supervision and control is inadequate. In the process of employee induction training, the contents of the internal control risk manual prepared by the position of the employee did not take into account all the risk points, resulting in the subsequent identification and processing of related risk points, the employee has no countermeasures to solve such incidents when he/she has not mastered part of the risk points and the degree of mastery is not deep. As for zhengbang Group's application of SACA internal control self-evaluation mechanism, the internal control self-evaluation mechanism is monitored by the management of each department, and the evaluation results and methods may be too subjective, leading to the disqualification of evaluation results.

The second line of defense failed to feedback rectification. The risks primarily referred to threats that had direct or indirect impact on the functioning of the organisation, thence the causes of their occurrence and effects are determined [7]. But the business division did not go down to the

grassroots to find out if the problems and risk points reported by its subordinates were true. The legal department is only established in the headquarters, and it has weak control over legal publicity, business ethics education and legal risks of contract signing in branches, service departments and pig farms in 22 regions of the country.

The third line of defense audit rate is low, it is difficult to standardize integration. The insufficient number of auditors, the excessive number of audit units, the audit efficiency of audit institutions is low and the audit process is difficult to unify and standardize the integration, which makes the audit work difficult to continue.

3. Internal Control Optimization of Zhengbang Group Based on COSO Framework

3.1 Strategic Adjustment

Management should specifically strengthen its control environment and risk assessment procedures [8]. Zhengbang Group's strategy needs to be redefined at the present stage and return to the meaning of the company's strategy itself. One is to reorganize the strategic analysis, understand the current industry environment and its own competitive position, in order to ensure its leading position in pig breeding, according to the development trend of current pig breeding and future pig breeding scale, use the calculation model to properly adjust the strategic standard data. Second, experts are invited to brainstorm, and multiple sets of standby strategic plans are formulated from the perspective of multiple evaluation systems. The group determines the final plan according to the plan most suitable for the company's current development trajectory. The third is to change the thinking of strategic formulation from the terminal thinking to the journey thinking. Four from multi-point blossom into a key breakthrough, is the state group to create output value of billions of group, according to the pork market in our country is totally has the ability to support the company achieve this goal, but only if the state is needed group to deepening and optimization in the aquaculture industry, reduce the blind expansion in other industries.

3.2 Integrated System, Partition Logistics

3.2.1 Eliminate Data Silos

The company should take "Pig breeding Digital Platform" and "Fan-micro OA" system as the two main fulcrum, and other systems as the auxiliary fulcrum. VR pig system is used to monitor and observe the farms in real time, and upload the collected pig weight, feed and other related data to BI data warehouse. BI data warehouse conducts integrated analysis on the data, and upload the analysis results to the "Pig Digital Platform". The "Digital pig breeding platform" transmits the data summary to the "Big Data Integration platform", which classifies and analyzes the summary data. One is the data conforming to the sale and slaughter of pigs, and the other is the pig breeding data. The adult pigs that meet the requirements of sale and slaughtering will be fed back to the "Pig Breeding Digital Platform", and the sales information will be uploaded to "BangMaibao" or other sales websites. Meanwhile, the order delivery information will be fed back to the digital platform in time, and the platform will transfer the relevant customer data or enterprise slaughtering department information to the OTB system for processing. OTB will also transfer the relevant financial data to Kingdee Cloud Sky System for reimbursement. The pig breeding data are transmitted to the "Fan-micro OA", which establishes independent tasks such as feeding and drug use "different from pig" according to the data, and the tasks are completed by the staff in "BangFanbao".

3.2.2 Refine Logistics Zoning Positioning

Due to the long geographical span of zhengbang Group's field, setting up regional headquarters according to the location of the area will enhance the control activities in the logistics process. According to the current digital logistics map of the company, it is not suitable for Zhengbang Group to divide according to the normal geographical location of Central China, South China and northeast China, and other factors such as the number of factories, logistics routes and logistics costs should also be considered.

To sum up the above factors, the Group can divide into four zones, namely north China, Central China, South China and Southwest China. Logistics information headquarters and logistics summary stations are set up in each zone. The location of logistics information headquarters should be set up in provinces with better location within the region, which can better implement the scheduling work; The logistics summary station should be set in the province nearest to the Jiangxi headquarters, and can be used as the final gathering point of the partition. If it is difficult to set up the summary point of the partition, multiple transport main roads should be built according to the actual situation, and transport summary points should be set up respectively. The geographical area of North China is very wide, but the number of factories in each province is small. Inner Mongolia is the largest with only two factories, so all five provinces are included in North China. In terms of geographical location, Liaoning is the best choice for logistics information headquarters, while Hebei is the logistics summary point.

3.3 Improving Human Resources Management and Environmental Governance

In the design of human resource evaluation index, the scope should be clearly defined. The specific weight division can be flexibly adjusted according to the different contents involved in the work according to the three perspectives of "quality factor, post factor and performance index", so as to form the employee evaluation standard. According to the factors in Table 1 and the requirements of different characteristics of different positions, the weight of factors can be measured as appropriate, and the average value can be taken after scoring from the four perspectives of superior, self, peer and subordinate to comprehensively evaluate the overall quality of employees.

Table1: Performance Appraisal score Table

Rated items:	Scoring elements:
The quality factor	Business ability, adaptability, organizational ability, innovation ability, communication ability, ideological quality and so on
Job factors	Experience, degree of risk, complexity, importance, intensity, etc
Performance appraisal	Work quality, work efficiency, work results, etc
Grading Angle	Superior rating, self rating, peer rating, subordinate rating

Zhengbang Group needs to improve the post rotation mechanism after the year-end human resources assessment, and the general principle is "in line with the group's development strategy and human resources development plan". Enterprises should properly arrange workers, realize the full use of talents, the implementation of the post avoidance system, and effectively do because of the matter of post, post matching, post matching, post coordination. It is necessary to strengthen the cultivation of professional skills and moral quality of employees when managing them [9]. In addition, as pig factories are generally set up in remote areas far from urban areas, enterprises can

invest in the construction of some basic entertainment facilities to enrich the life of employees in each area.

In terms of environmental control, the technology of Zhengbang Academy of Agricultural Sciences can be used to promote clean production and dry manure cleaning. For example, sewage discharged from pig factories can be imported into biogas digester to produce biogas, and pathogenic microorganisms can be killed through anaerobic fermentation, which can prevent environmental pollution and open up the use of secondary energy. In addition, the establishment of pig industry cycle, increase the strength of pig harmless treatment, to achieve comprehensive agricultural utilization. The establishment of complete and standardized breeding files, the establishment of industrial circulation mode and the realization of unified epidemic prevention management, improve the ability of pigs to resist disease, reduce the possibility of the disease dead pigs being randomly buried events.

3.4 Reform Internal and External Information Communication Channels

3.4.1 To Carry out Cooperation with XinNongbao

Build a comprehensive Internet platform for intelligent management, and monitor and trace a series of breeding. Develop comprehensive breeding service platform through XinNongbao software, integrate resources, link farmers, unify feeding management, unified epidemic prevention, scale development and market effectively docking, combined with online and offline promotion; Implement registration and record information for breeding farms, carry out online consultation, including scientific research achievements, new processes, new methods, application and promotion of patented technology, adoption data check, etc.; In all aspects of foreign information release platform to realize the online product traceability, farm operator to input information, contains the basic information, rating system and epidemic prevention information and so on, and then the background of audit information, information update, upload video, etc., and to track the monitoring data information, consumers can clearly online on food quality can be traced back to the source.

3.4.2 We will Keep Open Channels of Communication with Other Countries

In external information communication, the Group connects three systems, namely, The OA system, the QianLima bidding platform and the Kingdee Cloud Sky Financial system. The company's procurement business is concentrated in the OA system to carry out application, approval, ordering, tracking and monitoring and other business processes, helping the Group to achieve convenient, efficient and safe procurement needs.

3.4.3 Configure Internal Communication Channels

According to the division of different functional departments and different employee levels, corresponding standards and requirements are set in OA system. First, the management can observe the whole organization through the data statistics of OA system, arrange effective time more reasonably, supervise important affairs and participate in relevant meetings, understand the status of employees and find outstanding employees at the grass-roots level. Employees can effectively record their daily work results in OA system, provide employees with a four-in-one working platform of work, resources, learning and performance, and achieve objective company assessment. One input and multiple multi-point use, multi-stage input automatic summary, multi-point input single point aggregation. The second is to get through the nodes between the business departments, realize the OA system query and reuse of the ERP system master data, promote the integration of

ERP system business process and OA audit process, and achieve the requirements of business management integration.

3.5 Implement the Supervision and Management System

First of all, the heads of all business departments of the Group collected the possible risk points in each link and process of each post, and compiled their handling suggestions into a required book for new employees through professional advice and mature experience of employees in each post when they encountered such events. In terms of SACA's internal control self-evaluation mechanism, its evaluators should not be limited to the level of leading cadres, but should decentralize their evaluation rights and let employees participate in it, so as to be more democratic and standardized.

Secondly, the company should regularly carry out anti-corrosion education for its personnel, with diversified means and methods, so as to make employees pay attention to the serious punishment or criminal responsibility that may be caused if they engage in illegal activities. In addition, the company also need to cooperate, the upper and lower linkage, explore headquarters and branch office and the service such as judicial project risk, strengthen construction and various services such as legal institutions, making it in legal affairs management and operation you don't have to rely on the company's legal department to deal with, can be a relatively independent law related affairs.

Finally, strengthen audit staff recruitment and training, vigorously strengthen the building of information quality of internal audit personnel, actively carry out the audit personnel information audit business related training work, such as "intensive" training mode, and "one plus one helping" training mode, rapidly improve the ability of new information audit of the auditor. And accountants need to pay attention to the internal audit of power companies, strengthen the awareness of corporate audit risk prevention, improve the construction of auditing systems, and strengthen internal control in auditing activities to improve the quality and efficiency of internal audit control of power companies [10].

4. Summary and Suggestions

Zhengbang group will effectively using technology of data on the building of the COSO internal control framework, in the control environment, risk assessment, control activities, information and communication and supervision of the five point of view, the application of the big data technology under the reasonable planning of the group's strategy, eliminate the phenomenon of "data island", accurate logistics division, optimization of human resources and environmental resources management effectiveness, Unimpeded internal and external information channels, establish three lines of supervision. Based on the application of big data technology, COSO internal control framework provides Zhengbang Group with an effective means of risk management. With the continuous development of big data technology, its various advantages will continue to highlight, which can provide new help for more internal control of enterprises. How to apply big data technology in the internal control of different types of enterprises in a more efficient and reasonable way will also be what many managers need to think about.

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