

Research on the Optimization of D Port Company's Comprehensive Budget Management System

Wei Di^{1,a} and Runqing Liao^{2,b,*}

¹Jiangsu University of Science and Technology School, Zhenjiang, Jiangsu, China

²Jiangsu University of Science and Technology School of Economics and Management, Zhenjiang, Jiangsu, China

^ajszjdw@126.com, ^b945965896@qq.com

* Corresponding author

Keywords: Port; Comprehensive budget management; System optimization

Abstract: Port industry belongs to traditional production-oriented service industry, which is different from manufacturing industry and consumer service industry. Compared with other types of enterprises, port enterprises have certain uniqueness in daily operation and financial management—Its production and consumption are synchronized, and the production process is the consumption process of products. Because of this uniqueness, port enterprises must meet their own needs when implementing comprehensive budget management. Therefore, this paper takes D port company as an example, analyzes the existing problems in its current budget management from three aspects: budget preparation, budget execution and control, budget evaluation and incentive, and optimizes the comprehensive budget management system of D port company according to the business characteristics of port enterprises, so as to improve the effect of enterprise budget management under the unique operation mode of port.

1. Research Status of Comprehensive Budget Management Theory

From the 12th century to the 14th century, budget management first emerged in Britain, and the government only used it to restrict royal power and government expenditure. In 1911, Taylor elaborated the main theories of scientific management in his major book "principles of scientific management", which made people realize that management is based on clear laws, regulations, principles and scientific principles, and also enabled more enterprises to apply the theories of standard cost and difference analysis to corporate budget management[1]. A professor at the university of Chicago in the United States in 1922, James McKinsey published the first a systematic works budget control, budget control theory of comprehensive budget control theory are introduced, and the past bits and pieces of content, not enough system of budget, developed into a scientific, systematic management tool, it marks the enterprise comprehensive budget management theory began to form[2].

The systematic study on the theory of comprehensive budget management of enterprises by Chinese economists started in the 1990s. By from the earliest budgeting research starting point, in 1991, according to the enterprise in different stages of its life cycle, Wang Bin put forward in the different stages of life cycle have different budget starting point of view, and for each life cycle stage characteristics, points out that the start-up stage, growth, maturity and decline four stages the starting point of budget planning[3]. Su Shoutang (2001) believed that the overall budget of an enterprise should take target profit as the starting point of the budget, and the execution, monitoring and adjustment of the budget process should be guided by target profit, which could help improve the scientific and effective management of the enterprise budget. Zhang Guowei (2015) through the effective use of information system, the implementation of comprehensive budget management can help enterprises, group, sum up the experiences of budget management, and points out that the key to enhance the level of budget management is: to strengthen the construction of the information system, the reasonable positioning budget organization functions, detailed planning and enterprise

strategy and operation plan, strengthen the budget management in the process of communication, refining the essence of budget content, etc.

To sum up, it is not difficult to find that most of the current studies on budget management focus on a certain budget link, a certain financial index or a broad set of comprehensive budget management system, but there are few targeted optimization studies on budget management system based on specific industry characteristics or company business types. With the rapid development of China's ports, it is urgent to improve the overall budget management requirements of port enterprises. Only by optimizing the overall budget system according to the characteristics of port enterprises can the overall budget management of port enterprises be more efficient.

2. Characteristics of Port Enterprises

2.1 Synchronization of production and consumption processes.

The production of port enterprises means that port employees use transportation loading and unloading tools or other equipment to transport goods from the storage yard to the ship's cabin, or from the ship's cabin to the storage yard. In the process of loading and unloading, the original shape and nature of goods are neither changed nor the quantity is increased or decreased, but only the space position is moved. Indicators measuring port output include cargo throughput, natural tons, and port product value is the total output value of the port. Products produced by ports are different from those produced by general manufacturing industry. Port products do not have physical form, but provide a kind of labor service, and the production process and consumption process are carried out simultaneously. These characteristics of port products have an important impact on port capital structure, operating cost and daily management of the company.

2.2 Unavailability of port services.

Due to the synchronization of port production and consumption, port service cannot reserve inventory. The manufacturing industry is product oriented and can reserve a certain amount of inventory to deal with unexpected situations in the production process, such as equipment failure, job vacancy, finished product damage and so on. However, port service is oriented by customer demand, and the service provided by it can only be realized at the same time when customer demands are put forward. For example, only when the ship is docked at the dock can the port provide cargo loading and unloading services, which cannot be compensated or adjusted by inventory. The port's production capacity is usually certain, which requires that the port's production capacity must meet the fluctuations of customer demand.

2.3 Multiple safety incidents.

Port is a cross and complex operation site composed of people, machine, cargo, ship, environment and other elements -- personnel training is not in place, resulting in uneven quality level and different operation methods; With trailers, forklifts, cranes and other large mobile, fixed machinery as the main equipment, supplemented by human group labor to ensure the continuous operation of three shifts 24 hours and the transfer of goods; In the process of loading and unloading a cargo ship or even a working line, several operations are often crossed or exchanged at the same time. The daily inspection and maintenance of safety facilities are not in place and hidden dangers are not eliminated in time; The emergency plan fails to cover all areas such as the operation area and storage area, so it is less feasible in case of emergency. The above are the main reasons that may lead to frequent port security accidents.

3. Problems and Optimization Measures in the Comprehensive Budget Management of D Port Company

3.1 Budgeting.

Budgeting is the starting point of the whole comprehensive budget management. D company's

current comprehensive budget preparation is based on the principle of "top-down, bottom-up and top and bottom combination". First, it decomposes the budget objectives according to D company's overall strategic objectives and determines KPI indicators. Combined with the specific functions of each department, the enterprise KPI indicators were allocated, and the department-level KPI was determined. After the comprehensive budget indicators of each department were decomposed, the comprehensive budget preparation of the company was basically completed. D company's comprehensive budget preparation needs to set business objectives centering on customer, quality, efficiency, diversification and professional development. Based on this budget objective, company D selected five key success factors as finance (0.6), customer (0.09), operations management (0.24), learning and growth (0.06) and motivation (0.01).

Table 1 D company KPI budget indicator decomposition table in 201X

Index name	KPI indicator	Data source
Finance (0.6)	Total profit	Accounting department
	The unit variable cost	Accounting department
	The rate of income variable cost	Accounting department
	Throughput	PD
Customer (0.09)	Market and site coordination	Ministry of Commerce
	Guarantee of berthing of sea liner	PD
	Local berthing guarantee rate	PD
Operations management (0.24)	Capacity construction rate	PD
	Functional management execution	HR、 Accounting department
	Legal system (risk control) work evaluation	General management department
	Two levels of authority management fees	Accounting department
	Degree of financial integration	Accounting department 、 CEO
	Asset management	Accounting department
Learning and growth (0.06)	Core post personnel loss	HR
	Completion rate of training program	
	KPI system integrity	
Motivation (0.01)	Innovation in technology and management	

Existing problems: as can be seen from company D's overall strategy and KPI indicators after the decomposition of budget objectives, as a typical port enterprise, company D neglected the importance of service capability and safety that could reflect the characteristics of port enterprises in the initial stage of comprehensive budget management. This will lead to the following budget execution and port operation due to excessive pursuit of production, and reduce the quality of port services and the importance of port safety operations.

Optimization measures: first of all, D company should add responsible safety and environmental protection and quality accidents exceeding the standards in the operation management KPI indicators, and directly deduct the points based on the final KPI indicator assessment score of the number of accidents, and the production management department and the safety supervision department should be responsible for data recording. Secondly, D company needs to add other evaluation indexes of port operation service capability into customer indexes. The customer scores each port service; D company also needs to add the self-evaluation index of port operation ability into the incentive index, and the budget executor will self-grade each operation. The evaluation and self-evaluation criteria are divided into three levels: poor, average and excellent. This index is mainly applicable to the assessment of front-line operators at the port. Besides KPI assessment scores, the production management department and human resources department are responsible for the statistics of the data. After optimization, the five key success factors and proportions of D's budget should be finance (0.5), customer (0.12), operation management (0.3), learning and growth (0.06) and incentive (0.02), respectively.

3.2 Budget execution and control.

Every step in the overall budget needs to be approved. In the process of budget execution, the budget responsible person of each post should also provide the contract, invoice and other documents related to the project to support the execution of the budget project, and the financial department of the company can only allocate funds after the approval of the general manager and the group budget management committee.

Existing problems: budget approval requires a large amount of work and a high requirement on the quality of approval. It can neither consume labor costs excessively nor rely entirely on simple accounting information system. Different departments and positions have different budget objectives and budget plans. In the process of budget execution, real-time monitoring and feedback should be carried out for every step of data information of each budget execution position. At the same time, the newly added port service evaluation index requires the executor, customer and service content to be unified, which is tedious to manually arrange and has a high error rate.

Optimization measures: with the help of financial sharing service platform. For some is not in conformity with the approval process in the process of budget implementation, does not conform to the budgeting target budget items automatically set "reject", at the same time add manual approval in automation for examination and approval work of examination and approval to increase flexibility, for example: some budget beyond the initial budget of the project, but if not be approved may lead to more losses, this case need artificial circumstances given examination and approval decision, so that the budget of the project examination and approval is more flexible and accurate.

Data monitoring and feedback of budget control by setting up early warning index in the financial share system, budget group setting, such as throughput, profit total variable cost, the unit variable cost and income rate indicators such as the specific limits, reach a limit will trigger a traffic light alarm signal, and received a red light signal and budget execution, the responsibility of the department shall timely find out the cause of the parameter values deviation, reasonable and effective measures are put forward.

Table 2 Warning classification of D company's annual financial key indicators

Signal classification	Index name	Budget value	Actual value	Deviation degree	Signal meaning	Problems warning and countermeasures
Green light	Total revenue			<10%	Normal	Show "pass", send "continue current operating status" prompt, and check the rationality of the budget value.
	Unit variable cost					
	Variable cost rate of revenue					
Red light	Handling capacity			≥10%	Abnormal	Show "no pass", send "actual deviation from the indicator data", and distinguish whether the difference is benign or malignant. Monitor the change trend of risk in real time, guard against the aggravation of risk, and instruct the responsible person of relevant post to explain the reasons for the difference, and give countermeasures within the specified period.
	Variable costs					
	Total profit					

As for the port service evaluation index newly added in the budget target KPI index, the budget executor should input the specific port production content into the financial sharing system in advance, connect with the client and his own evaluation authority, submit and automatically

generate his-evaluation/self-evaluation options. The client and the budget executor can enter the system to score the service capability with the permission. In order to avoid malicious bad evaluation, if the system receives the "bad" evaluation, the budget executor can consider whether to appeal to the department head. After considering the actual situation, the department head has the right to maintain the original result or modify the result. The advantage of doing so is that it can enhance D's employees' sense of honor and shame and sense of responsibility, strengthen the sense of service, and play a role of warning and timely correction.

3.3 Budget evaluation and incentive.

The comprehensive budget evaluation link is the assessment and evaluation of the implementation and completion of the entire budget program, so its content must be consistent with the content involved in the company's overall budget: the main body of the implementation of the budget is the main body of the budget evaluation. D company will link the evaluation result with the interests of the person in charge of each position participating in the budget according to the reward and punishment system. D company's budget evaluation can be carried out from five dimensions: finance, customer, operation management, learning and growth, and incentive. It has achieved the integration of financial and non-financial indicators and achieved the balance of the overall budget evaluation results of the enterprise.

Existing problems: in all budget KPI assessment indicators of D company, not all indicators are weighted or directly constitute the total evaluation score. For example, indicators of technical management and innovation items and indicators of safety and environmental protection and quality accidents exceeding the standards shall be directly added or subtracted based on the final assessment score of KPI indicators based on the number of events, without assigning weights. Other assessment/self-assessment indicators of port operation service capability are evaluated separately in a hierarchical manner in addition to KPI assessment scores, and no grading is required.

Optimization measures: the total score of budget evaluation shall be equal to the sum of weighted index scores \pm the number of events. If the total score of budget evaluation of each department is greater than or equal to 90% of the budget target value, it is deemed to have achieved the budget target, and the part whose net profit index is higher than the budget target value is calculated and withdrawn as department bonus by 10%. However, if the total score of budget evaluation in each department is less than 90% of the target value of the budget, it shall be regarded as failing to reach the company's budget target, and part of the year-end bonus shall be deducted as punishment. In terms of the port operation capability index, the level of the budget executor will directly determine his position and salary. If, in the whole budget cycle, the number of items that are rated as "poor" and not appealed or failed to appeal accounts for more than 20% of the total completed items, the corresponding salary or demotion or dismissal shall be deducted; Awards and promotions should be given if the number of items rated "outstanding" by others accounts for at least 45% of the total completed by an individual throughout the budget cycle.

4. Other Auxiliary Optimization Measures

4.1 Update organizational framework.

On the basis of the original department organization of D company, a special budget agency and financial sharing center are set up.

Budget department under the general manager: responsible for the preparation of the draft budget and formal programs, and the implementation of the company's annual operating budget, capital budget and financial budget after approval. The general manager of the company is responsible for the budget execution process and results. Generally, the implementation and completion of the overall budget objectives are the main basis for assessing the management of the company.

Financial sharing center: Financial sharing service center will process all business data in a

centralized way to realize data sharing and business transparency. The standardized operation and automatic processing of the system greatly improve the efficiency of D company's overall budget management and save labor costs. At the same time, system control reduces human error, simplifies the complexity of the approval process, strengthens the company's control over business, and reduces the financial risks of D company.

4.2 Improve the system.

In order to build a complete, practical and long-term comprehensive budget management system, there must be constraints and norms of the company system. The basic management system of comprehensive budget mainly Outlines the management system and functions of comprehensive budget, the compilation, implementation, adjustment, control and assessment of the budget. The comprehensive budget management method is to elaborate the basic management system module of the comprehensive budget, and clarify the general process of various items in this module, so that the comprehensive budget management system has a higher operability. Comprehensive budget management rules and procedures are further detailed on the basis of the basic system and management methods, providing clear operational methods and steps for comprehensive budget management at all levels of the enterprise. They are the most specific action plan and guide all levels to carry out comprehensive budget management in an orderly manner.

5. Conclusion

Port occupies very important position in national economy, it is the hub that connects land and water to transport. Due to the variety of business of port enterprises, decentralized functions of various departments, and relatively complex capital management, comprehensive budget management needs to be as comprehensive as possible. Only by constructing a comprehensive budget management system in line with the characteristics of port enterprises can the utility of the comprehensive budget of ports be maximized. In addition, port companies also need to increase investment in related construction, such as: improve the system to ensure the security of company data information; Pay attention to the strengthening training of relevant personnel's professional knowledge; Timely scrap and update port operation security equipment.

References

- [1] Frederick Winslow Taylor. The Principles of Scientific Management [M],1911.
- [2] James O.McKinsey.Budgetary Control [M],1992.
- [3]B.Wang. Enterprise budget management and mode[J]. Accounting Research,1991(1):20-22. (In Chinese)
- [4] J.X.Hu. Study on comprehensive budget management system of HT new material company based on KPI[D]. Hubei: Master's thesis of school of economics,2019(06).
- [5] Z.Jia. Comprehensive budget management practice[M]. Beijing: Machinery Industry Press,2015.7.
- [6] F.L.Zhang,G.L.Tang,C.Lu. Total budget management 2.0: the key to solving 8 big problems for managers[M]. Beijing: Machinery Industry Press,2017.5.