The Construction and Research of Control System and Accounting Informatization by Visualization Mode

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Abstract. This article raises the issue of enterprise cost and project management control, analyzes the cost and expense project management and control model, and proposes the definition of daily business documents and cost types involved in the cost and expense project management and control model. In the cost and expense project management and control model, the following concepts are proposed: target cost, budgeted cost, actual cost, contract split cost, non-contract split cost, pending split cost, dynamic cost, design and cost expense project management Control related daily business processing documents, that is, contract documents, non-contract documents, cost documents to be incurred, and payment documents, and decompose to generate corresponding contract split costs, non-contract split costs, pending split costs, and corresponding The payment plan can be compared with the real-time monitoring of the target cost and budget cost through the dynamic cost (the sum of contract splitting cost, non-contract splitting cost, and pending splitting cost) and the real-time monitoring of the payment time, payment amount and payment plan Realize the management and control of cost items. At the same time, the paper puts forward the basic idea of the design of the cost and expense project management and control system, analyzes the flow of the cost and expense project management and control system, and demonstrates the operating effect of the cost and expense project management and control system.

Keywords: management accounting informatization, budget management, cost allocation, report analysis.

1. Introduction

Accounting informatization is not just a concept innovation, it is in fact conforming to the development trend of informatization, fully relying on and applying modern information technology in the field of accounting, reorganizing the content, methods and procedures of accounting work, through accounting and information technology To meet the management needs of the information society; from a practical point of view, accounting informatization is a systematic business, and its implementation and application require scientific planning, rigorous construction, and reasonable use, especially in the construction of enterprise accounting informatization. Following the national macro-guidance principles, we should proceed from our own characteristics, use the cost-effectiveness principle, and carry out our

work step by step and in stages. How to establish an enterprise cost management model adapted to the information environment has become a new topic of enterprise cost management.

2. Enterprise cost analysis in the information environment

2.1. The impact of informatization on the competitiveness of enterprises

The role of enterprise informatization is achieved through the introduction of modern information technology. The introduction of advanced technological means may and should bring efficiency and benefits to enterprises. Informatization is inevitable for the development of enterprises, and it is a major opportunity and challenge. We must seize the opportunities brought by informatization and strengthen the organization of national economic and social informatization under the guidance of the national strategic policy of "informatization drives industrialization". Lead, accelerate the formulation and implementation of the national informatization master plan, and promote the process of informatization in various fields of the economy and society. This is the key to improving the company's core competitiveness. Only in this way can the micro-foundation of comprehensive national strength be strengthened. China has joined the WTO, and companies can only cope with the challenges of economic globalization if they really have certain core competitive advantages [1].

2.2. The impact of informatization on the cost structure

Traditional cost control must monitor the production process and use the results of the difference analysis as feedback information to correct deviations so that production can proceed smoothly, but this manual control method has become unable to adapt to the ever-changing conditions of modern information technology and tends to change. Eliminate. First of all, the objects controlled by the entity have got rid of human control and are subject to the control of automated machines. The production management personnel in the manual state cannot timely control the cost of the product according to the production process and perform cost variance analysis in a timely manner. This must be done by the information system. Second, the variance analysis under standard cost accounting is losing its effectiveness. The premise of standard cost accounting is the production of small quantities and large quantities, the production operations of enterprises are relatively stable, and the materials and labor consumed by unit products are relatively stable. However, due to the competitive pressure of the modern market and the diversification of customer needs, the company's product production has gradually shifted to customized production for multiple varieties and small batches of customers. Repeated standard operations are greatly reduced, and the product's material consumption and manual input often change. In this way, standard cost accounting is gradually useless. Finally, the ERP system based on the idea of supply chain needs to focus on cost control of the entire value chain rather than simply manufacturing cost control. The cost control of the entire value chain makes the traditional cost management system seem powerless. Figure 1 shows the accounting information system.
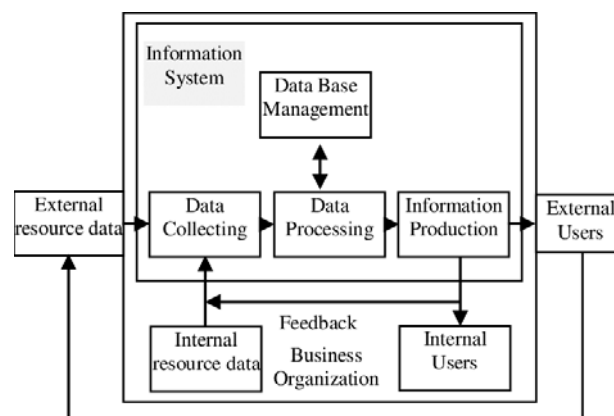

Figure 1. Accounting Information System

Accounting information has the characteristics of universality, integration, dynamicity and graduality, and is an important support for the high-speed and effective operation of accounting work. Accounting informatization is different from accounting computerization. The former is a qualitative leap in technology and content [2]. Regardless of historical background, goals, technical means, functions and scope of accounting procedures, the objects and systems of information input and output, there are significant differences (Figure 2 Schematic diagram of enterprise accounting informatization process).
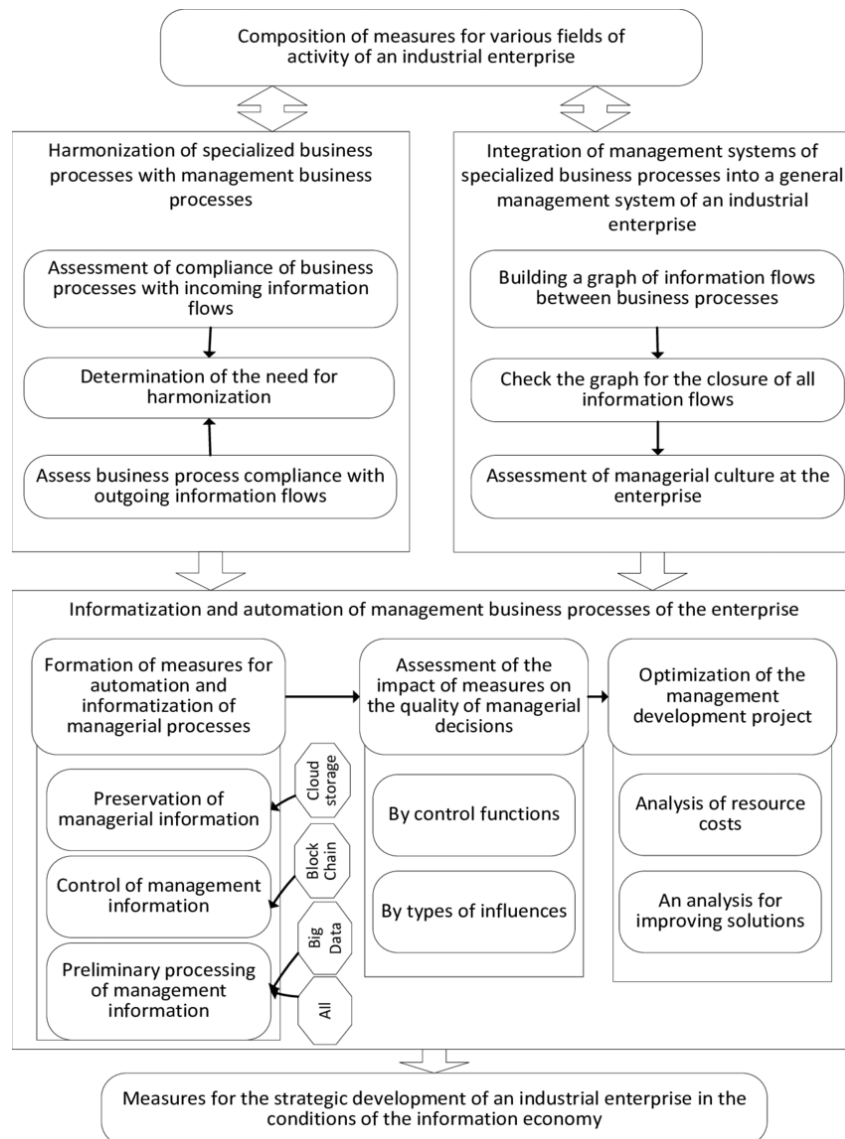
Figure 2. Schematic diagram of enterprise accounting informatization process

3. Cost and expense item management control model analysis

3.1. Definition of daily business documents involved in the cost and expense project management control model

In order to manage and control the cost and expense items, three business processing documents are designed in the system to control and manage the actual cost and expenses, namely: contract documents, non-contract documents, and cost documents to be incurred [3]. They separately record the following

economic business that the enterprise needs to incur: there is a clear contract entered by Party A and Party B entered into the contract document, there is no clear contract entered by Party A and Party B into the non-contract document, some tentative expenses and unforeseen expenses are entered Until the cost document is incurred. The confirmation of contract documents, non-contract documents, and pending cost documents will result in three types of split costs: contract split, non-contract split, and pending split cost. In the system, the corresponding payment documents are also designed to determine the actual expenses incurred by the enterprise. The payment documents are mainly for contract split, non-contract split, and pending split costs. The definition of daily business documents and cost types involved in the cost and expense project management control model are shown in Figure 3.
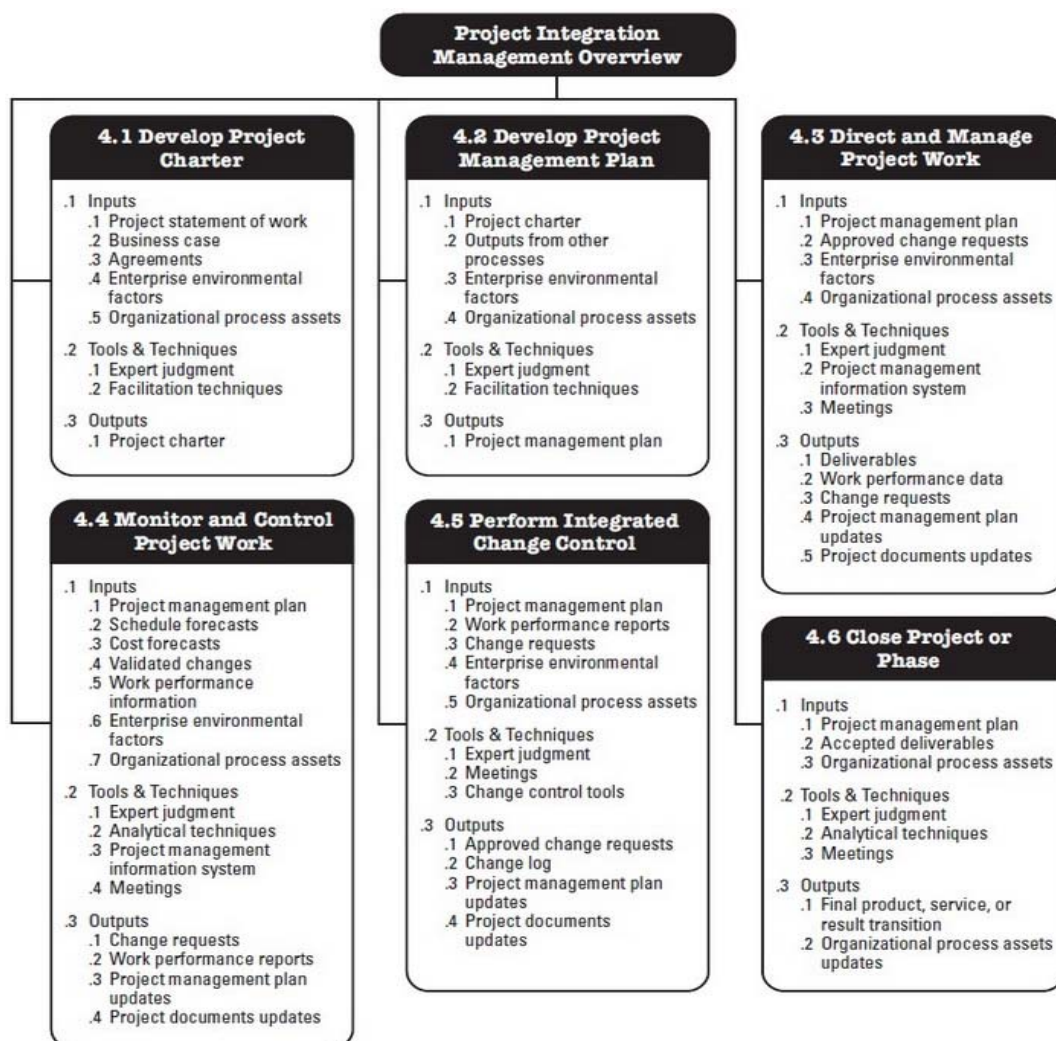
Project Integration Management Overview

4.1 Develop Project Charter

.1 Inputs
  .1 Project statement of work
  .2 Business case
  .3 Agreements
  .4 Enterprise environmental factors
  .5 Organizational process assets

.2 Tools & Techniques
  .1 Expert judgment
  .2 Facilitation techniques

.3 Outputs
  .1 Project charter

4.2 Develop Project Management Plan

.1 Inputs
  .1 Project charter
  .2 Outputs from other processes
  .3 Enterprise environmental factors
  .4 Organizational process assets

.2 Tools & Techniques
  .1 Expert judgment
  .2 Facilitation techniques

.3 Outputs
  .1 Project management plan

4.3 Direct and Manage Project Work

.1 Inputs
  .1 Project management plan
  .2 Approved change requests
  .3 Enterprise environmental factors
  .4 Organizational process assets

.2 Tools & Techniques
  .1 Expert judgment
  .2 Project management information system
  .3 Meetings

.3 Outputs
  .1 Deliverables
  .2 Work performance data
  .3 Change requests
  .4 Project management plan updates
  .5 Project documents updates

4.4 Monitor and Control Project Work

.1 Inputs
  .1 Project management plan
  .2 Schedule forecasts
  .3 Cost forecasts
  .4 Validated changes
  .5 Work performance information
  .6 Enterprise environmental factors
  .7 Organizational process assets

.2 Tools & Techniques
  .1 Expert judgment
  .2 Analytical techniques
  .3 Project management information system
  .4 Meetings

.3 Outputs
  .1 Change requests
  .2 Work performance reports
  .3 Project management plan updates
  .4 Project documents updates

4.5 Perform Integrated Change Control

.1 Inputs
  .1 Project management plan
  .2 Work performance reports
  .3 Change requests
  .4 Enterprise environmental factors
  .5 Organizational process assets

.2 Tools & Techniques
  .1 Expert judgment
  .2 Meetings
  .3 Change control tools

.3 Outputs
  .1 Approved change requests
  .2 Change log
  .3 Project management plan updates
  .4 Project documents updates

4.6 Close Project or Phase

.1 Inputs
  .1 Project management plan
  .2 Accepted deliverables
  .3 Organizational process assets

.2 Tools & Techniques
  .1 Expert judgment
  .2 Analytical techniques
  .3 Meetings

.3 Outputs
  .1 Final product, service, or result transition
  .2 Organizational process assets updates

Figure 3. Definition of daily business documents and cost types involved in the cost and expense project management control model

3.2. Cost and expense item management control mode

There are two processing modes for the actual payment document. One mode still takes target cost and budgeted cost as the control line, and its processing flow is similar to the above flow. After the payment document is entered, the system will calculate the actual cost of the expense item. If the actual cost of the expense item exceeds its corresponding target cost and budgeted cost, the system will prompt and refuse to confirm. At this time, the corresponding payment document can only be confirmed by adjusting

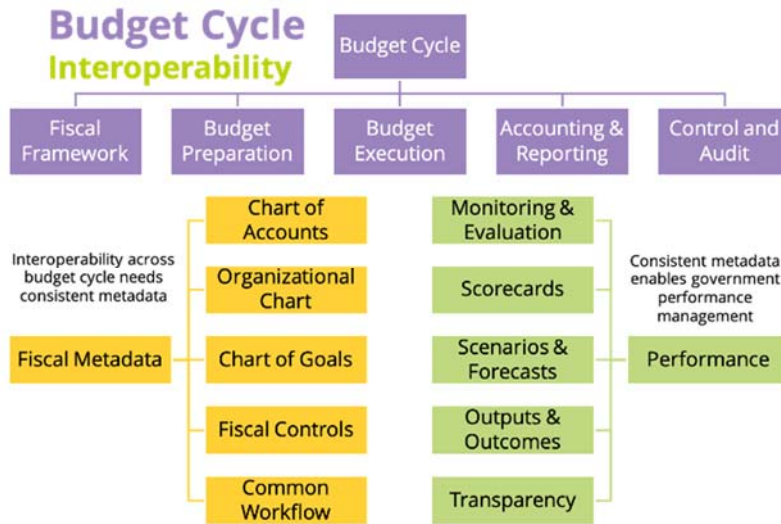the value of the corresponding expense item in the target cost and the budget cost. As shown in Figure 4 [4].

Figure 4. Cost and expense project management and control mode

4. Research on financial cost control algorithm

The relationship between product quality and cost of an enterprise is difficult to determine because it is impossible to establish a quantitative mathematical model. On the relationship of quality cost, Dr. Zhu Lan proposed the "best quality cost model", as shown in Figure 5
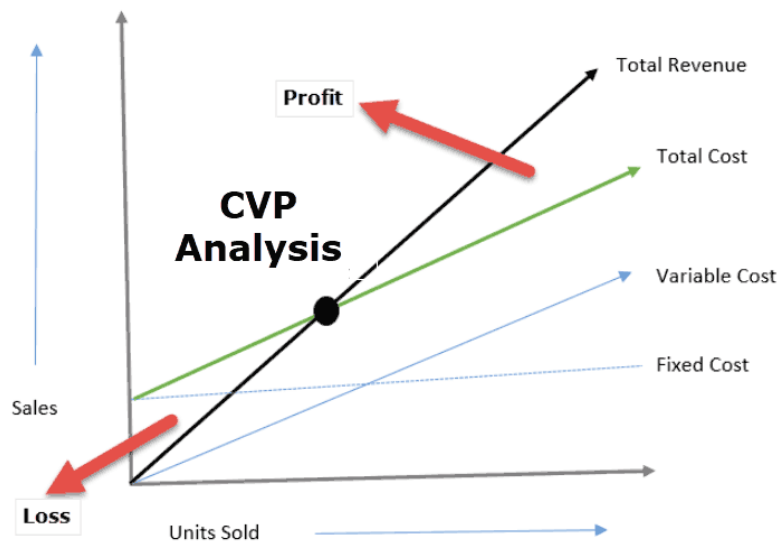

Figure 5. Best quality cost model diagram

It can be seen from the figure that when all products are 100% good, the failure cost is 0, and the pre-identification cost tends to∞; when the product can reach a conforming quality, the failure cost approaches ∞, The cost of prevention and identification is very small; when the quality level of all products is close to 0, then simply not to invest in construction at this time, it is meaningless for research. According to Dr. Zhu Lan's quality cost model, we can use the tangent function to simulate the

foreseeable cost and the cotangent function to simulate the failure cost. Therefore, the model for obtaining quality cost is as follows:

$$C(i)C_b(i)\left\{\begin{array}{l}\omega_1\left[tg(\pi/2)\times R(i)\right]^{K_1}+\\\omega_2\left[ctg(\pi/2)\times R(i)\right]^{K_2}\end{array}\right\} \tag{1}$$

Among them: $C(i)$ is the total cost of quality; the first item in the formula is the pre-assessment cost, the second item is the failure cost; $C_b(i)$ is the basic value of the cost of the i-th subsystem; ω_1 and ω_2 are the pre-assessment cost and loss cost account for The proportion of cost; $R(i)$ is the reliability of the i-th subsystem; $K_i \quad i=1,2$ is the cost growth index. This value is different for different companies due to their different technical and management levels. In business management, each sub-item business can be regarded as a subsystem. In this paper, each operation (process) is taken as the basic unit of quality cost control. In business practice, it is generally given a target quality level to find the optimal cost of the system. Combined with the above relationship model of quality cost, the objective function of quality cost optimization based on genetic algorithm is:

$$y = \boldsymbol{min}\sum_{i=1}^{n}C(i)C_b(i)\left\{\begin{array}{l}\omega_1\left[tg(\pi/2)\times R(i)\right]^{K_1}+\\\omega_2\left[ctg(\pi/2)\times R(i)\right]^{K_2}\end{array}\right\} \tag{2}$$

Since the objective function is to be minimized, the fitness transformation needs to be performed. According to the practical application experience, the linear scale transformation of fitness is selected. In the selection of genetic operators, select the optimal group selection operator, the two-point crossover operator and the single-point mutation operator, and in the value of the crossover probability P_c and the mutation probability P_m, in order to make the optimization speed in the early stage of evolution Speeding up, and the probability of destroying good individuals in the later stage of evolution is reduced, and the dynamic crossover operator and dynamic mutation operator are selected. The specific implementation is as follows:

$$P_c = P_{c0}\left(\frac{mgen-ren}{mgen}\right) \tag{3}$$

$$P_m = P_{m0}\left(\frac{mgen-ren}{mgen}\right) \tag{4}$$

Among them: P_c, P_m the probability of crossover and mutation until the current generation; P_{c0}, P_{m0} the probability of initial crossover and mutation (generally, the value range of P_{c0} is $0.4 \sim 0.99$, P_{m0} and the value range is E0.0001 to 0.1); gen is the current evolutionary generation; mgen is the set maximum evolutionary generation. As shown in Figure 6, the quality cost optimization calculation process based on genetic algorithm.
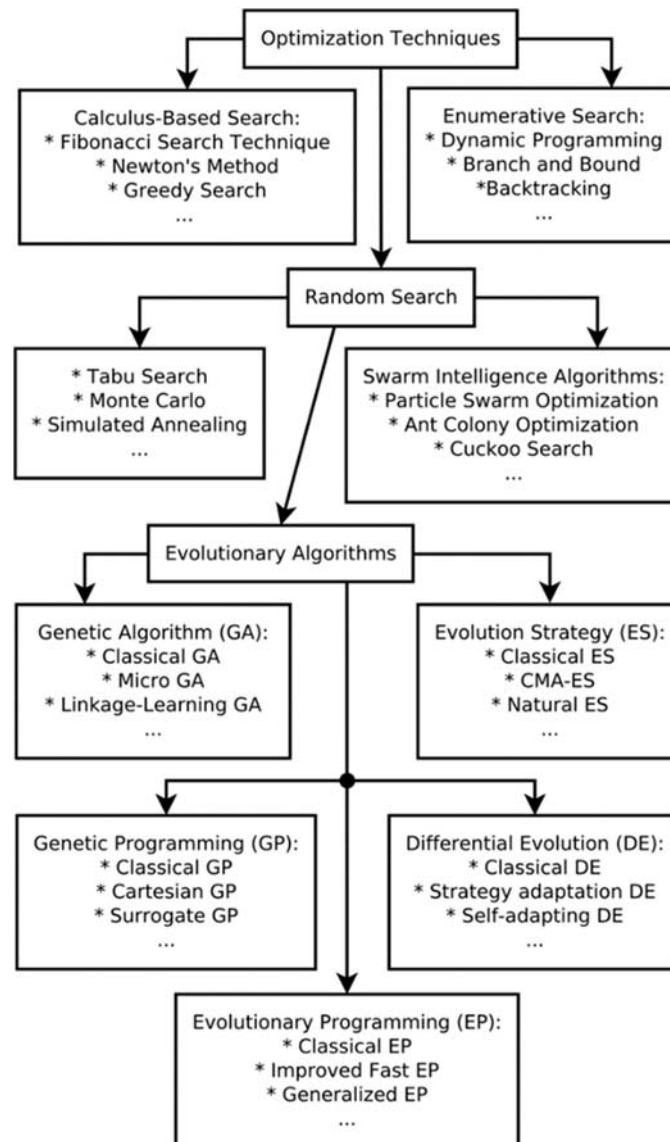
Figure 6. Genetic algorithm-based quality cost optimization calculation process

5. Company financial cost control system

5.1. Functional structure

Based on functional requirements, the comprehensive budget module in the cost control management system builds a unified comprehensive budget management platform, forming a flexible and efficient annual budget preparation system that integrates and complements each other from bottom to top and from top to bottom. Realized rolling forecast and budget tracking management on a monthly and quarterly basis. The full cost allocation module realizes the full cost allocation with the branch as the target and the classification accounting with the business line as the target, and can generate monthly, quarterly, and annual branch profitability analysis tables and products (that is, business lines) for profit Ability analysis table. The report analysis module forms a report analysis system with six topics including management summary, branch briefings, income thematic analysis, cost thematic analysis, business volume analysis and financial statement analysis. The senior management level and the heads of branches provide a real-time and dynamic report query platform. As shown in Figure 7, it is the basic function of the financial cost control system [5].
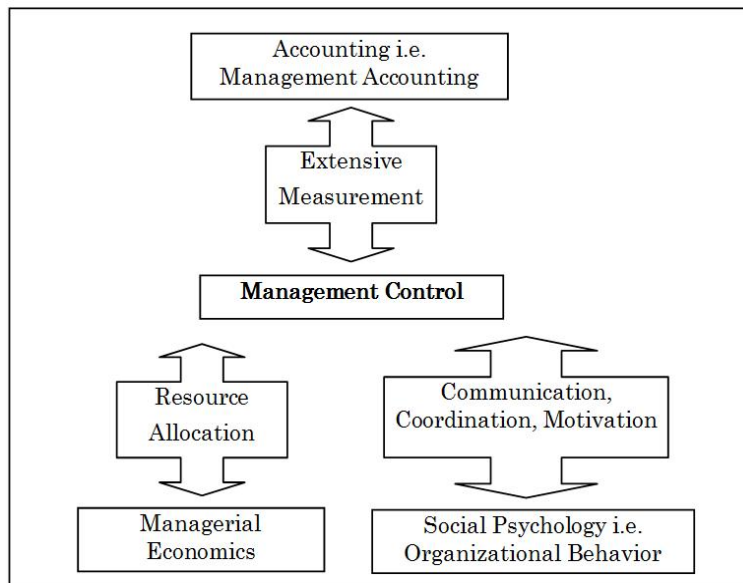
Figure 7. Basic functions of financial cost control system

5.2. Logical structure

The comprehensive budget management module is responsible for income budget, special cost budget, procurement budget, investment budget, expense budget and financial budget. Among them: the financial budget is the core, receiving the budget data of other budget sub-modules; the fixed asset part of the procurement budget will enter the investment budget; the investment budget will ultimately be attributed to the expense budget. The full cost allocation module is responsible for the budget caliber cost allocation and actual caliber cost allocation. One is to allocate the indirect expenses of the branch to each business line of the institution, and the total cost of each business line of the branch is obtained by summing up, which is classified accounting; the second is to allocate the indirect expenses of the headquarters to each branch Through summarization, the cost of each business line and each branch in the group can be obtained, that is, the full cost allocation. The report analysis module is responsible for the analysis of budget execution, profitability and other financial indicators. As shown in Figure 8, it is the logical structure of the financial cost control system [6].
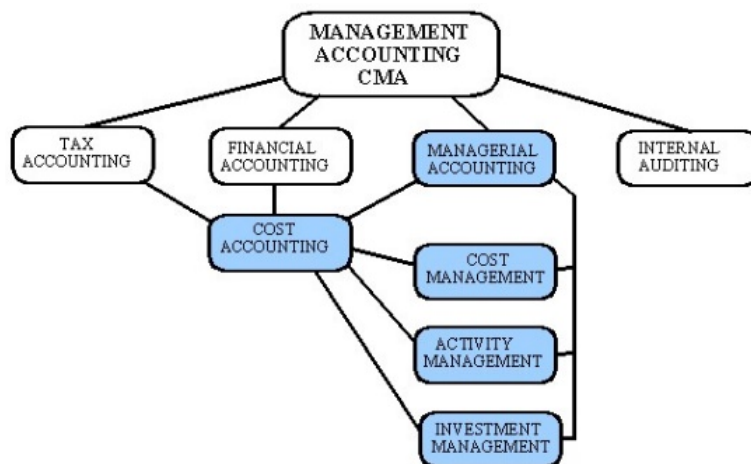

Figure 8. Logical structure of financial cost control system

5.3. Technical architecture

The cost control management system adopts EPM and BIEE two converged intermediate product solutions, which are deployed in a unified manner in the WebLogic middleware container to provide services. Among them, the bottom-level various data sources (Excel, xml files, DW, ODS relational libraries, multi-dimensional databases, etc.) are processed and loaded through the ETL (Extract-Transform-Load, data extraction, conversion and loading) tool. Go to ESSBASE (a multidimensional database management system for EPM system), and then summarize the ESSBASE data to provide a data source for front-end applications. At the EPM and BIEE application layers, three models of comprehensive budget management, full cost allocation, and report analysis were built, and various analysis management charts (forms, pie charts, bar charts, bar charts, lightning charts, etc.) were created. In addition, the client can access system data through Excel plug-ins (SmartView, Add-in), and can also access various functions of EPM and BIEE through the EPM web client workspace, such as Planning applications, Web Analysis reports, FR reports, BIEE meters Disk, report analysis, etc.

5.4. Data architecture

The data structure of the cost control management system not only involves data storage and loading within the management accounting system, but also involves data interaction with external financial accounting systems and business systems. Among them, three types of basic data, budget data, forecast data and actual data, are stored in the comprehensive budget management module. The budget data is generated by budget preparation. In this process, the standard cost data of each business provided by the full cost allocation module needs to be used, and reference to the forecast data; the forecast data is generated by rolling forecast. This process uses the actual data of the current period, including actual income the actual cost and actual business volume are provided by the financial accounting system and business system respectively. Three types of basic data of actual cost profit, budget cost profit and standard cost are also saved in the full cost allocation module. Among them, the actual cost profit is generated by the cost allocation of the actual caliber, and the actual data in the comprehensive budget management module including actual income, actual expenses and actual business volume are needed; the budget cost profit is generated by the cost allocation of the budget caliber and the comprehensive budget management is required The income budget data, expense budget data and special cost budget data in the module; the standard cost is formulated by the enterprise according to the actual situation and entered into the full cost allocation module. The report analysis module saves actual data and budget data. Among them, the actual data includes actual income, actual expenses, actual business volume, and actual cost and profit, which are derived from the comprehensive budget management module and the full cost allocation module; budget data includes budget revenue, budget expenses, and budgeted business volume, and budget cost and profit, respectively It comes from the comprehensive budget management module and the full cost allocation module. The financial accounting system mainly generates financial data, and at the same time receives the expense budget data from the comprehensive budget management module, so as to control the budget during the actual expense expenditure. In addition, it also receives sales invoices and purchase invoices from the business system for timely collection and payment operations, and collects sales and procurement data through the auxiliary accounting of income and expense accounts to each business line for subsequent cost allocation. jobs. The business system mainly generates business data for the financial accounting system and management accounting system for further use [7].

6. Conclusion

The impact of information technology on accounting, the integration of accounting and information technology is a dynamic process of continuous development and change. As long as the processing of accounting information still mainly depends on information technology, the development of accounting informatization will not stop, and the costs it bears and the benefits it generates must attract our attention. First of all, it should be realized that the construction of enterprise accounting informatization is not a one-time process. It requires a lot of manpower, material and financial resources to be implemented in

phases and has a certain time period. Second, costs and benefits show different characteristics at different time stages. It should be inspected and evaluated according to different stages and categories; in the end, we should see that the construction of enterprise accounting Informa ionization is not once and for all. Its benefit is obtained on the premise of long-term investment, and it cannot be choked on. Therefore, in the construction of enterprise accounting informatization, we should hold a continuous view of cost-effectiveness, to achieve the detail of the previous argument, the rigor of the implementation process and the rationality of performance evaluation, to avoid transitional caution and blindness.

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