



Project Management Development – Practice and Perspectives

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THE TOOLS OF CONTROLLING IN THE CONTROL SYSTEM OF PROJECT MANAGEMENT

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Abstract

Controlling is a tool to support effectiveness of business management. Under objective conditions, markets are becoming more global with new competitors, product life cycles are shortening, customers are more demanding and the complexity of technology is increasing. In order to increase the effectiveness of an enterprise's activity in the present economic conditions new methods of supervision are necessary corresponding to the complexity of external and internal environments of enterprises. Controlling is an integral aspect of management. The purpose of this paper is to study application of the controlling in project management of small enterprises. Contemporary organizations are increasingly using the project approach for development of their business, where the project control and the controlling are playing significant role in the success of the project.

Key words: *controlling, financial controlling, project management, project control*

JEL code: *M10, M20*

Introduction

The globalization of economic communications, information technology development, technological progress, competition and market requirements are processes which characterize the present stage of the world economy development. For the survival and development of the enterprises, especially small ones, they must adapt not only to rapidly changing environment conditions, but also to the speed of the changes. Tasks that enterprises tackle are associated with strategic changes and renewal of production, finding new markets and good sales channels, cost management and cost reduction, development of alternative strategies, and improvement of competitiveness. Solving these problems requires strategic vision and competences of the business managers. Therefore, the management of enterprises must pay attention to the modern concepts and approaches of business management where the controlling plays a key role. Consequently, the balance between control and flexibility becomes the main point in the modern controlling process. Controlling is a tool of support for the effectiveness of project and business management.

In spite of the existence of a broad range of research covering the problem of controlling development and implementation, published by international authors, the problem is the still low level of interest both among the Latvian industry and scientific society. No complex view on progressive controlling implementation in management of the Latvian industry has formed, even though it could become the tool transforming the industrial map of Latvia and increasing industrial effectiveness in a modern economy based on knowledge.

The purpose of this paper is to study the issues of application of the controlling approach in project control and cost management. The subject of the study relates to the project management control system. The subject of the research is the use of financial controlling tools in project management. The methodological basis for the article is made up of scientific literature analysis of foreign authors and research carried out by the authors of this paper. The listing of literature provides references to works of Latvian and international authors, and sources of publicly available information.

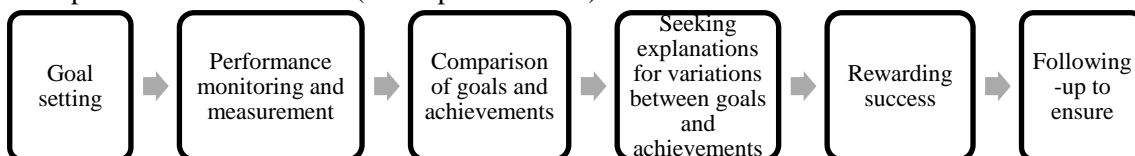


The control and controlling models

The stages of controlling process

The modern enterprise is a complex system that has developed on the basis of scientific and technical progress, the rapid changes in the external environment and highly competitive environment. In these conditions achievement of their strategic targets is not a simple task. For the operative decision-making, every manager needs timely and relevant information about the changes occurring both in external and internal environment of the enterprise, therefore enterprise management system must be constantly improved. Consequently, according to goals formulated, time span and measure of tasks to be solved, operative or strategic controlling could be chosen. Both strategic and operative controlling have similar goals, but they differ in the modeling used for said purposes. Controlling could carry out the control process over achieving both strategic and operative goals of enterprise activities. They also differ in tasks and applied tools. Strategic controlling is a management activity that comprises the planning, testing, implementation and monitoring of strategies analyzing the following: internal and external environment; competition policy, main factors (clues) of success, strategic portfolio creation, analysis of strategic plans and parameters of performance assessment available, analysis of chain of values, analysis of strategic statement, analysis of costs, connecting with basic factors. Operative controlling is a management activity that comprises the fixing of objectives, budgeting and controlling in the medium-term, its goal is the creation of an adequate management system and it tries to optimize the proportion of costs/profit. Operative controlling leads to short-term effectiveness, it controls profit margin, costs, liquidity and productiveness. (Horvath P., 2006) Controlling involves the action designed to ensure that an entity is successful in achieving its objectives. In an organization, this usually involves managing people in such a way as to elicit their best efforts on behalf of the organization.

In each company, there are four hierarchical levels of management: material, operative, strategic and intellectual. These levels of management are responsible for tasks connected with running the enterprise. The first two levels (material and operative) are concerned with operative controlling and the last two levels (strategic and intellectual) are concerned with strategic controlling. Therefore, the controlling hierarchical perspective includes the levels of strategic planning, managerial control and operational control. The controlling process consists of various stages (Fig.1). Controlling is also viewed as an integral part of managerial responsibilities and activities. Thus, controlling is not something performed after the fact, but a continuous function performed along with other functions (planning, organizing and directing) necessary for the success of the organization. It is widely recognized that management's functions include planning, organizing, staffing, directing and leading, controlling, and coordinating. It is the management's responsibility to put enterprise resources to use, sometimes taking risks, to achieve the goals of the organization, be it to earn a profit (in the private sector) or to provide a social service (in the public sector).



Source: prepared by authors based on the classification

Fig.1. The main stages of the controlling process



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Management sets goals and formulates policies, develops plans to achieve goals within the framework of the entity's policy guidelines, implements programs of action designed in accordance with the plans, maintains information systems to report progress towards achieving the specified targets, and reviews the results of all of these activities, identifying needed changes to goals, policies and plans. (Garrison, R., Noreen, E. Seal, W., 2003)

Robert Mautz and James Winjum describe various concepts of control from a historical perspective and distinguish between accountants' views about control and management's views. (Mautz, R., 1981) They point out that management's concept of control is much broader than that traditionally espoused by accountants. Most current definitions of control refer to the strategy process in the same way. Robert Anthony defines management control as "the process by which managers assure that resources are obtained and used effectively and efficiently in the accomplishment of the organization's objectives" and later as "the process by which managers influence other members of the organization to implement the organization's strategies". (Anthony, R., 1964)

Management controls benefit rather than encumber management and must make sense within each organization's unique operating structure and environment. Managers are responsible and accountable for the quality and timeliness of program performance, increasing productivity, controlling costs, protecting resources, mitigating adverse aspects of operations, and assuring programs and functions are managed with integrity and in compliance with laws. Control is concerned with ensuring that the plan is followed. Notably, the accounting function plays a major role in the control phase. Accountants maintain the databases and prepare the reports that provide feedback to managers. The feedback can be used to reward particularly successful employees, but more importantly, the feedback can be used to identify potential problems and opportunities that were not anticipated in the plan. Based on feedback, it may be desirable to modify the plan. The feedback can be also used to identify parts of the organization that need help and those parts that can provide advice and assistance to others. Anthony defines "managed costs" in making a distinction between management control and technical control. Management control involves the whole organization and includes those parts of the organization where managed costs are significant. (Anthony, R., 1964)

Technical control involves only activities where there are no significant managed costs. Management control covers the whole organization, where technical control relates to subunits, or activities of subunits. The focus of management control has changed over the years. Historically, the focus of management control was accounting, based on financial information. Factory accounting, budgeting and cost accounting were the main activities performed. Management accountants provided support in areas of planning and control using financial data. Non-financial data was used only in providing financial advice. The term "control" is used in a wide variety of situations to describe many different phenomena. Consequently, different disciplines use the term differently.

There are two concepts of controlling – German and American. The German concept is based on the internal aspect, and the American concept includes the external accounting systems, such as financial accounting. In U.S.A, the record is limited to operational information to the management of the company through the accounting system. The American model of controlling focused on external users, and so it is based on the audit and the audit approach. In German-speaking countries the controlling function is seen as a service function – support for managers in the strategic and operational management processes. The German controlling is



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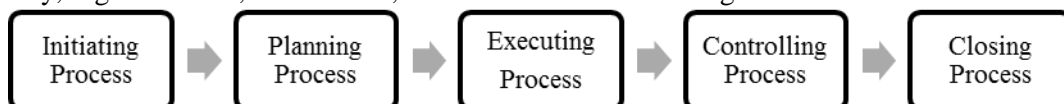
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first and foremost a set of tasks related to the planning, the integrated information management system for tracking data. Controlling is the whole process of defining objectives, of planning and controlling (in the sense of steering and regulating) and includes all relevant financial and commercial aspects, in the words of Peter Horvath. The German definition is close to Anthony's concept of management control. Controlling involves monitoring, evaluating departmental, and staff activities on an ongoing basis, and taking appropriate corrective action when necessary. It is impossible to control departmental and staff activities without having a set of plans, standards and guidelines against which to compare actual performance. Senior management's monitoring activities are designed to monitor adherence to information systems policies, standards and procedures.

Stages of project management process

The project management approach is relatively modern. It is characterized by methods of restructuring management and adapting special management techniques, with the purpose of obtaining better control and use of existing resources. The rapid rate of change in both technology and the market has created enormous strains on existing organizational forms. Project management has long been discussed by corporate executives and academics as one of several workable possibilities for organizational forms of the future that could integrate complex efforts and reduce bureaucracy of the traditional business organizational form.

Projects and project management processes vary from industry to industry; however, there are more traditional elements of a project. The overarching goal is typically to offer a product, change a process or to solve a problem in order to benefit the organization. Project Controls encompass the people, processes and tools used to plan, manage and mitigate cost and schedule issues and any risk events that may impact a project. Project control is substantially equivalent to the project management process stripped of its facilitating subprocesses for safety, quality, organizational, behavioural, and communications management.



Source: authors construction based on literature analysis

Fig.2. The main stages of project management process

Project Management Institute, Inc. (PMI) defines project management as "the application of knowledge, skills, tools and techniques to a broad range of activities in order to meet the requirements of a particular project." The process of directing and controlling a project from start to finish may be further divided into basic phases:

1. Project conception and initiation. An idea for a project will be carefully examined to determine whether or not it benefits the organization. During this phase, a decision making team will identify if the project can realistically be completed.
2. Project definition and planning. A project plan, project charter and/or project scope may be put in writing, outlining the work to be performed. During this phase, a team should prioritize the project, calculate a budget and schedule, and determine what resources are needed.
3. Project launch or execution. Resources' tasks are distributed and teams are informed of responsibilities. This is a good time to bring up important project related information.



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4. Project performance and control. Project managers will compare project status and progress to the actual plan, as resources perform the scheduled work. During this phase, project managers may need to adjust schedules or do what is necessary to keep the project on track.
5. Project close. After project tasks are completed and the client has approved the outcome, an evaluation is necessary to highlight project success and/or learn from project history.

Table 1

Main activities of project management process stages

Stages	Main activities
Project initiation	<ul style="list-style-type: none"> • Selection of the best project given resource limits • Recognizing the benefits of the project • Preparation of the documents to sanction the project • Assigning of the project manager
Project planning	<ul style="list-style-type: none"> • Definition of the work requirements • Definition of the quality and quantity of work • Definition of the resources needed • Scheduling the activities • Evaluation of the various risks
Project execution	<ul style="list-style-type: none"> • Negotiating for the project team members • Directing and managing the work • Working with the team members to help them improve
Project monitoring and control	<ul style="list-style-type: none"> • Tracking progress • Comparing actual outcome to predicted outcome • Analyzing variances and impacts • Making adjustments
Project closure	<ul style="list-style-type: none"> • Verifying that all of the work has been accomplished • Contractual closure of the contract • Financial closure of the charge numbers • Administrative closure of the paperwork

Source: *A Guide to the Project Management Body of Knowledge (PMBOK® Guide)—Fifth Edition*

Classical management is usually considered to have five functions or principles: Planning, Organizing, Staffing, Controlling, Directing. Project management is the planning, organizing, directing, and controlling of company resources for a relatively short-term objective that has been established to complete specific goals and objectives. Furthermore, project management utilizes the systems approach to management by having functional personnel (the vertical hierarchy) assigned to a specific project (the horizontal hierarchy). The project manager does not staff the project. Staffing is a line responsibility. The project manager has the right to request specific resources, but the final decision of what resources will be committed rests with the line managers. Moreover, not all industries have the same definition for a short-term project. Long-term projects, which consume resources full-time, are usually set up as a separate division or simply as a line organization.

The project management is designed to manage or control company resources on a given activity, within time, within cost, and within performance. Time, cost, and performance are the



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constraints on the project. If the project is to be accomplished for an outside customer, then the project has a fourth constraint: good customer relations. (Kerzner, H. R., 2013)

Project controls are the data gathering, management and analytical processes used to predict, understand and constructively influence the time and cost outcomes of a project or program, through the communication of information in formats that assist effective management and decision-making. In general, the basic elements and directions of activities of the project costs control are cost management, project budgeting, project cost estimating and analysis, life cycle cost analysis, cost reporting and analysis, cost performance index, analysis of resource management.

Project controlling activities

Project Monitoring and Control activities take place in parallel with project execution process group activities. The project is observed and measured regularly against the project plan to ensure that the project is within acceptable variances of cost, schedule and scope, and those risks and issues are continually monitored and corrected as needed. According to the Project Management Body of Knowledge (PMBOK), “the Monitoring and Control Process Group consists of those processes performed to observe project execution so that potential problems can be identified in a timely manner and corrective action can be taken, when necessary, to control the execution of the project.”

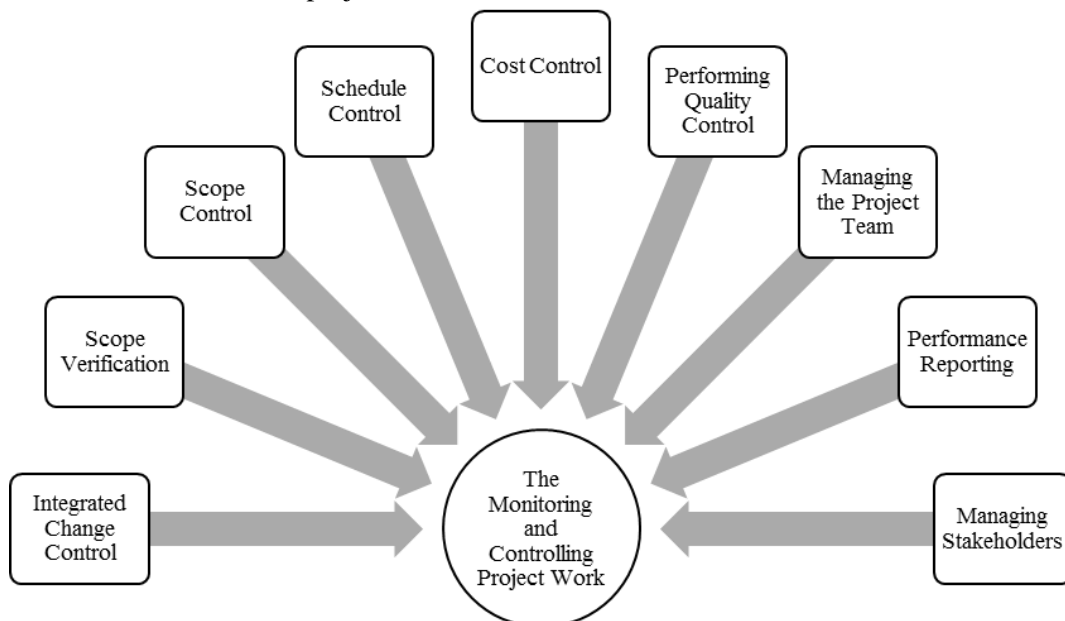


Fig. 3. Monitoring and Controlling Project Work process

The monitoring and controlling project work process collects measures and disseminates performance information, and assesses measures and trends to forecast potential items requiring corrective action. This includes monitoring project risks and ensuring that they are being managed according to the project’s risk plans. The integrated change control process ensures that changes because of project corrective actions and other controlling factors are managed across the project knowledge areas. Integrated change control takes place throughout the



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project, from project initiation through project closure. The scope verification process ensures that project deliverables are formally accepted. The scope control process ensures that changes to project scope are controlled. The schedule control process monitors and controls changes to the project schedule.

The cost control process monitors and controls costs and changes to the project budget. The quality control performance process measures specific project results to determine whether the project is meeting quality standards. This process tracks team member performance, provides feedback, resolves issues and coordinates changes to maintain and improve project performance. The performance reporting process collects and distributes performance information - including status reports, progress reports and forecasts. This process manages stakeholder communications and works with stakeholders to ensure that requirements are satisfied and issues are proactively resolved. The function of controlling is maintained by the management control system.

Table 2

Objectives, tasks and tools of controlling and project management control

	Controlling	Project Management Control
Objectives	<ul style="list-style-type: none"> • Systematic determination and creation of objectives • Development of strategies • Management consulting in economic, legal and tax matters • Creation of planning, control and information supply systems • Quick adjustment to changing environmental conditions • Systematic coverage of information • Systematic creation and increase of scope, acquisition and provision of information 	<ul style="list-style-type: none"> • To measure the performance of the project and address change requests, recommended corrective and preventive actions, and implement defect repairs.



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Tasks	<ul style="list-style-type: none"> • Planning and control of strategic or operational objectives • Financial planning and supervision • Planning and control of resources or material • Management consulting • Definition of planning period, planning instruments and methods • Organization of the planning sequence, documentation of planning activities • Success-oriented plans assessment • Consolidation of partial plans to company plan • Determination of information sources, definition of information instruments and methods • Supervision of realization, analyses of demand on information • Supervision of realization, planning and coordination of partial budgets • Supervision and checking of keeping the budgets • Development of an internal discrepancy analysis coverage 	<ul style="list-style-type: none"> • Performance measuring • Performance reporting • Identify and control changes • Verify and control scope • Control schedule • Control cost • Control quality • Risk monitoring and control • Take corrective action • Update PM plan • Update actions and changes • Inspections • Accept/Reject work • Identify & analyze trends • Look for new risks • Assess variances for change or corrective action • Manage Stakeholders • Contract administration • Use quality control tools • Project performance appraisals • Perform earned value calculations
Tools	<ul style="list-style-type: none"> • Management accounting • ABC costing • Target -costing • Budgeting • Planning of the income statement • Profit analyses • Long-term planning cash-flow calculations tentative balance sheets • Flowcharts • The financial plan break-even analyse • Gap -analyse • CVP -analyse • Cost calculations and analyse 	<ul style="list-style-type: none"> • Performance measurement and tracking techniques (e.g. PERT, EV, CPM) • Project control limits and thresholds • Project performance metrics • Cost analysis techniques • Project plan management techniques • Change management techniques • Integrated change control processes • Risk identification and analysis techniques • Risk response techniques • Problem solving techniques (e.g. root cause analysis) • Reporting procedures

Source: authors construction

The main purpose of monitoring and controlling activities is to be proactive in finding issues ahead of time and taking corrective action. Corrective action can require revisiting planning process group and updating the project management plan as needed with the ultimate goal of bringing the project back in line with project objectives and constraints and improving future execution to avoid repeating the same issues.

There are many definitions of project controls user across industries and indeed across companies within industries. By APM definition, the field of project controls is defined as follows: Project controls are the data gathering, management and analytical processes used to predict, understand and constructively influence the time and cost outcomes of a project or



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program; through the communication of information in formats that assist effective management and decision-making. Project controls encompass the people, processes and tools used to plan, manage and mitigate cost and schedule issues and any risk events that may influence a project. The execution of a project is based on a robust project plan and can only be achieved through an effective schedule control methodology. Furthermore, it is widely recognized by executives and scientists that planning and monitoring plays a major role as the cause of project failures. The project performance can be improved if dedicated project controls systems are in place. An IBC 2000 project control best practice study carried out by IPA identified that good project control practices reduce execution schedule slip by 15%. Project controls cost range from 0.5% to 3% of total project, (including cost accounting), therefore, to break even, project control needs to improve cost effectiveness by around 2%. (Stephen, J., 2015)

Costing methods in costs management

Cost accounting can be defined as the collection, assignment, and interpretation of cost. With specific order costing methods, each separate piece of work is a cost unit.

Table 3

The costing methods in costs management

Costing methods	Feature of costing methods
Absorption (Full) Costing Method	<ul style="list-style-type: none"> Financial accounting uses full or absorption costing to value stocks. In other words all manufacturing or production cost is charged to work in progress, then to finished goods before entering the profit and loss account as cost of goods sold. This definition of stock values complies with most financial accounting guidelines and tax regulations. Absorption costing in a modern standard cost system tends to produce a multitude of false alarm signals and adjustment items, whenever actual volumes differ from plan.
Variable Costing Method	<ul style="list-style-type: none"> For management accounting purposes, however, many companies use only variable costs to value stocks. (Kaplan R., Atkinson A.,1998) In this technique fixed manufacturing cost, which usually includes much of manufacturing overhead and may include even such items as direct labour, is charged as a period expense directly to the profit and loss account. In most circumstances, variable costing produces more relevant information for decision-making and for planning and control.
Marginal/Direct costing	<ul style="list-style-type: none"> The disadvantages of the traditional full cost approach have been long understood in theory. The growth in indirect cost as a proportion of total manufacturing cost in the last forty years gradually made the resulting errors unacceptable in practice. This led initially to the growth of marginal or direct costing in which only variable or direct product costs were traced to individual products. Marginal/direct costing still has a role in deciding how to allocate scarce company resources among products and, under special circumstances, in pricing decisions.
Multi-level Contribution Costing	<ul style="list-style-type: none"> Multi-level contribution costing attempts to push product, product group or business area information as close as possible to individual products without arbitrary allocation. This method combines a double approach. If cost cannot be allocated to individual products, it allocates them to the smallest relevant groups of products. It divides overheads into two categories: directly allocable or non-directly applicable. It then allocates them with a traditional direct cost based method



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Cost Attribution by Activity Based Costing (ABC)	<ul style="list-style-type: none"> Activity Based Costing (ABC) defines categories of activity in overhead departments, which on the one hand are recognisable to overhead department managers but, on the other hand, are driven by factors (cost drivers) which are characteristic of products and other cost objects. This has allowed a much higher proportion of total company cost to be allocated to products more strictly according to causation. ABC is a two-step process with variety of cost drivers from which to choose when explaining the costs of an activity.
Standard costing	<ul style="list-style-type: none"> The majority of the International companies use some sort of standard cost system. It is even accepted for external reporting to tax authorities and shareholders. Standard costing is both a simplification and an analytical tool. Pure actual cost systems become impossibly complicated and produce less relevant information for planning and control. (Martin, J.,2001)

Source: authors construction

This is the case in job costing and in contract costing. With continuous operation costing methods, however, costs are identified with continuous work over time (rather than with a specific piece of work), and then averaged over all units of output in the particular time period. This is the case with process costing and with operation/service costing. A manager will need to understand different theories or concepts about costing (Table 3). Two major accounting developments, used by controlling in Germany are the following: the first concept, called Einzelkostenrechnung, was highly influential in the academic field and involved assigning all expenses directly to cost objects; the second concept, called Grenzplankostenrechnung (GPK), is still in use today. The main idea behind GPK is the responsibility centre. Responsibility centres play a key role in manufacturing firms when it comes to managing cost. GPK helps keep the cost centres in check in areas such as cost planning and cost control, while measuring efficiency.

Interaction of financial system of controlling and cost management in project management control system

The financial controlling comprises the main processes such as cost accounting, budgeting, project investment assessment, cost recovery, where each process contains a number of subprocesses.

Table 4

Process	Subprocesses	Process	Subprocesses
Cost Accounting	<ul style="list-style-type: none"> The choice of costing system Cost classification Cost categorization Cost units Cost accounting methods Stock valuation methods 	Budgeting	<ul style="list-style-type: none"> Budgeting benefits Budgeting inputs Budgeting types Budget review
Cost recovery	<ul style="list-style-type: none"> Transfer pricing methods Billing 	Project Investment assessment	<ul style="list-style-type: none"> Net present value Payback period Return on investment Total cost of ownership

Source: authors construction



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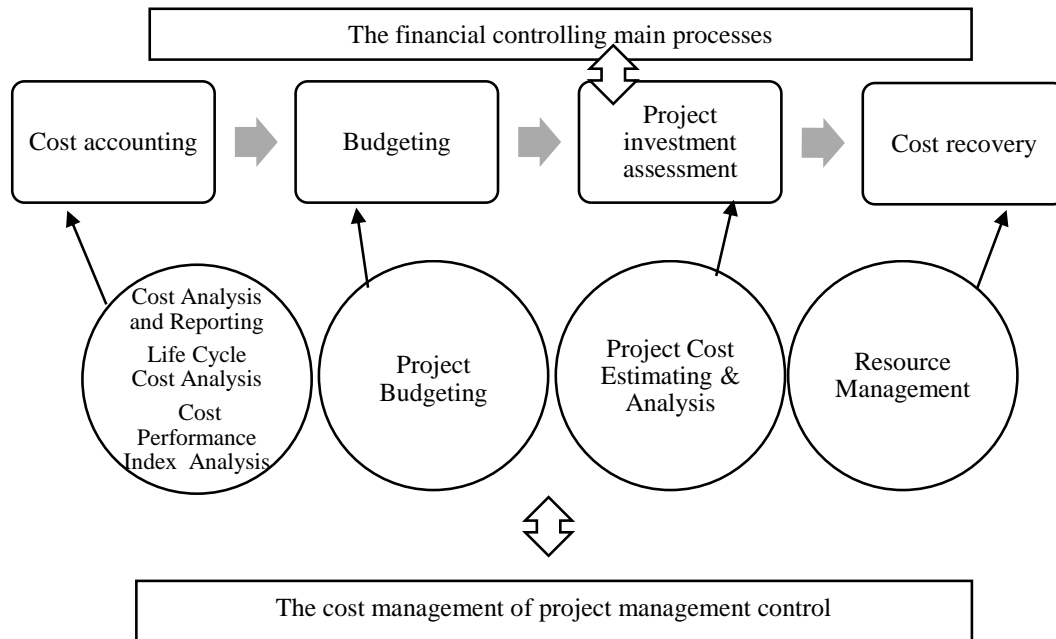
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Data collection and information processing capacity in financial accounting module are largely driven by external reporting requirements and financial management needs. Information technology and staff capacity are generally sufficient for current billing and accounting purposes, but would likely require enhancement to be able to support the additional tasks associated with decision support analysis.

Current revenue and cost data represent potential building blocks for expanding cost accounting analysis. The current service and outcome data represent a greater challenge for the project. Successful implementation of a decision support software system of controlling requires further extending on the existing incentives and capacity in information technology, data development, and staff capacity.

The main processes of the financial controlling and cost management of project management control are shown in Fig.4. Interaction of the controlling and cost management in project management control is carried out via a system of financial controlling.



Source: authors construction

Fig.4. Main processes of financial controlling and cost management of project management control

Conclusion

The wide range of challenges such as market globalisation, increasing focus on core competences, greater customer-orientation in terms of products and services, as well as advances in information and communications technology have set new requirements for management and controlling. In other words, controlling now fulfils an essential service function with regard to the management of an organisation.

In today's world the traditional boundaries between management and controlling are slowly disappearing, and as a result controlling plays an increasingly important part in all executive tasks. Controllers and managers now form a symbiosis, thus controlling largely



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depends on cooperation between these two groups. The traditional tasks of a controller are as follows - project controllers manage the financial aspects of projects for clients and organizations in a wide range of industries. They are financial managers who oversee project revenues and expenditures to verify that projects are completed on time and within budgetary guidelines. Typical work duties may include preparing and presenting financial statements, creating annual project budgets and forecasts, and supervising employees in finance departments. Project controllers may manage the financial services for designated clients or projects. They may perform project monitoring and data collection to determine if a project is progressing according to budget. This may include conducting project audits, managing project schedules, and overseeing regulatory compliance issues. Project controllers may also be authorized to make or approve project expenditures. In large organizations, project controllers may act as consultants to project management teams or manage accounting departments. They may also serve as liaisons between management and clients or between the finance department and project managers. Project controllers may also perform financial research, manage a project's general ledger, and/or monitor a project's cash flow.

The main purpose of monitoring and controlling activities is to be proactive in finding issues ahead of time and taking corrective action. Corrective action can require revisiting planning process and updating the project management plan as needed with the ultimate goal of bringing the project back in line with project objectives and constraints and improving future execution to avoid repeating the same issues. Project Controls encompass the people, processes and tools used to plan, manage and mitigate cost and schedule issues and any risk events that may impact a project. Project control is essentially equivalent to the project management process divided on its facilitating subprocesses for safety, quality, organizational, behavioral, and communications management.

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