

## Financial Management of High-Technology Innovation Enterprises

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**Abstract:** Article is devoted to the problem of financial management of companies working in the field of high technology and high-technology products. We consider the system of financial management, implementing full cycle of innovative enterprises and take into account all aspects of its activities: operating, investing and financing, determine the value of the budget revenue and expenditure management business units, structured on the basis of allocation of responsibility centers. The problem of inclusion of managerial accounting in an integrated system is developed on the basis of identified sequences of the accounting system in the enterprise, depending on the phases of the development cycle of the organization. Practical importance has recommendations on creating a management accounting system as one of the stages of this sequence.

**Key words:** Innovation • Responsibility center • Master budget • Financial risk management accounts • Life cycle of the organization • Management information system

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### INTRODUCTION

The basic factor of increase of steady economic growth rates must be innovation.

The important role in this achievement plays effective financial management, which first of all serves as informational base for making managing decisions at all vertical of management.

Financial management of innovation technologically oriented business is defined by numbers of peculiarities. Because of sharp reduction of life cycle of innovation products, the time on profit earning decreases and loss probability increases. This factor in combination with development of information technologies promotes the increase of business environment changes and rises the degree of its uncertainty for economics subjects. Uncertainty and dynamic character of high-technology production dictates limited dates of any business-projects. Effective management of high-technology productions is possible only with the help of rather large-scale strategy projects, including the national economy.

The main reason for efficiency of large corporations consists in aspiration to receive or strengthen synergetic effect which can arise thanks to the economy caused by scales of activity. Concentration of property allows to carry out technologically closed cycle of production-to create the closed technological chains from raw materials production before output [1].

Offered ways of increase of efficiency of high-technology innovative productions in many respects are connected with introduction at the enterprises of system of financial management which allows: to introduce rational and effective use of resources for achievement of the enterprise purposes; to provide balance of all income and expenses; to carry out the financial analysis of activity of the enterprise; to operate profit and profitability; to provide minimization of level of financial risk; to provide constant financial balance of the enterprise; to estimate potential financial possibilities of implementation of new business projects; to avoid bankruptcy [2].

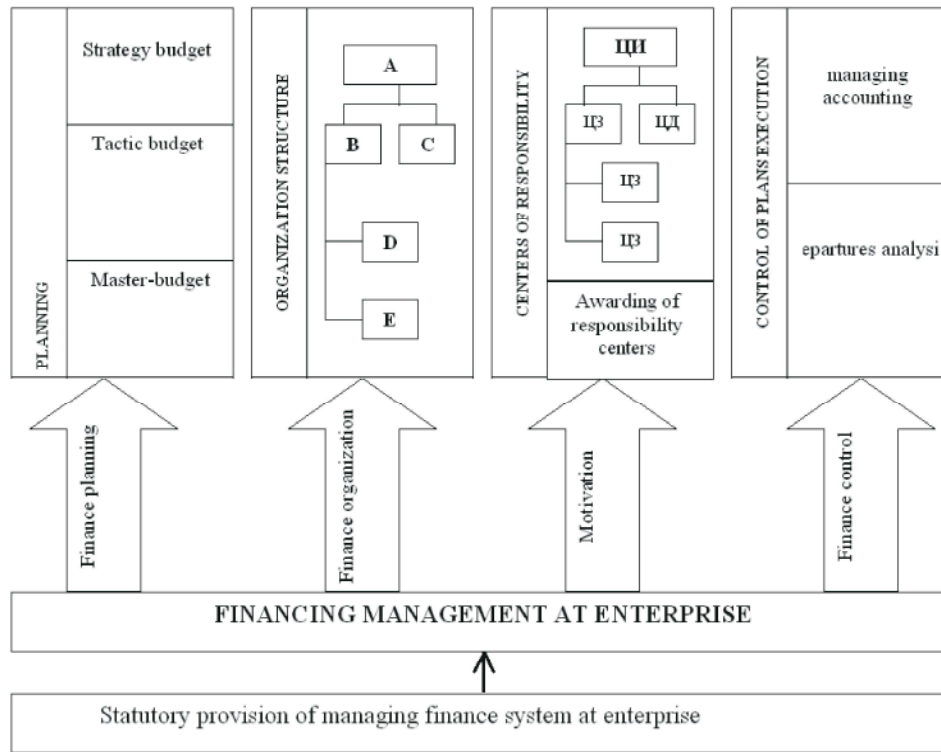


Fig. 1: Structure of system functioning of management at enterprise

The system of financial management (Fig. 1) can be presented as follows:

- financial planning (budgeting);
- financial organization;
- motivation on achievement of the planned financial performance;
- financial control (controlling or management accounting).

Function of planning is supported by system of budgeting of the income and expenses, which assumes the description of formal communications and ways of interaction between various divisions of the organization and helps to minimize probability of the negative consequences connected with lack of coordination [3].

The organization of performance of planned tasks is based on fixing of limited resources of the organization for achievement of goals behind certain elements of system. Financial structures provide acceptance and implementation of administrative decisions on all aspects of financial activity of the enterprise. Such structures are under construction on a hierarchical or functional sign with allocation concrete "the responsibility centers".

Function of motivation is closely connected with system of financial management. One of ways of effective use of budgets and standards as systems is their ratio with personal claims of managers, i.e. their comparison to the personal purposes which managers hope to reach.

Control function, provides effective control behind implementation of the made administrative decisions in the field of financial activity.

Thus, integrated financial management by the enterprise-the system, realizing a full cycle of business management: planning, the account, control, the analysis, administrative influence, updating of plans; by means of the financial measurement, considering all aspects of activity of the enterprise: operational, investment and financial.

Financial planning (budgeting) is one of the main instruments of financial management. Experience shows, that due to the lack of exact and systematic knowledge of the finance the Russian companies lose to the fifth part of the income. Budgeting-technology of planning, the account and control of money and financial results.

Introduction of system of budgeting creates the following advantages to the organization:

- The budget forces managers to look forward, trying to provide possible problems and ways of their decision. They allow to increase controllability of the company at the expense of expeditious tracking of deviations of the fact from the plan and timely decision-making.
- The budget creates an objective basis of an assessment of results of activity of the organization as a whole and its divisions.
- Development of the purposes has the additional effect concerning motivation of staff of the organization. The system of budgets and also participation of staff of the organization in their development can become strong incentive to improvement of their work.
- Budgets act as one of ways of distribution of data on productive and economic aspects of activity of the organization. System effectiveness of budgeting as communication environment as a whole is defined by degree of understanding and acceptance by all members of the organization of its principles and contents of the transmitted data and also degree of openness and clearness of official channels of transfer of data.
- Introduction of system of budgeting with the description of formal communications and ways of interaction between various divisions of the organization will help to minimize probability of the negative consequences, connected with lack of coordination.

Thus, a main objective of budgeting is increase of financial and economic efficiency and financial stability of the enterprise a way of coordination of efforts of all divisions on achievement of final, quantitatively certain result [4].

To support financial model of budgeting, it is necessary to define the budgetary regulations which will define the organizational scheme of process of financial planning and control at the enterprise. Formation of the budget is carried out according to the scheme providing "control with direct link" and "control with feedback" [5].

It should be noted, that one of important instruments of intra firm planning is business planning. The business plan is intended for justification of offered business and an assessment of results for a certain period of time. Therefore, it can be presented as the integral element of intra-economic planning and as the management for execution and control [6].

For the organization of budgeting it is necessary to decide on structure and information structure at the enterprise and to provide its effective functioning. The organization of budgeting assumes carrying out a number of preparatory activities:

- Design of financial structure of management;
- Development of structure of the general budget of the enterprise;
- Fixing of responsibility to budgets and their articles;
- Development of the budgetary policy (or I undressed in accounting policies), including methodical and organizational and technical questions;
- Development of provisions and budgeting regulations;
- Creation of specialized structure and/or fixing of functions on drawing up, coordination, control of items in the budget of officials.

The budget which covers the general activity of the enterprise, call general. The structure of the general budget of the industrial enterprise includes the interconnected system of financial and operational budgets (Fig. 2).

When developing financial model of budgeting it is necessary to consider the major limiting factors influencing business of the enterprise. In the different business directions of the enterprise can differ with sets of limiting factors.

Information containing in operational budgets, is used both for drawing up financial budgets and for operational management of activity of divisions of the enterprise (sale, logistics, production, supply).

Operational budgets are consolidated and form financial budgets (master budget): "Report on financial results", "Report on cash flow", "Book-keeping".

After formation of basic structure of operational and financial budgets, development of forms of budgets and their internal structure it is necessary to hold events for formation of qualifiers of budgets and items in the budget for fixing of powers on work with budgets for responsible experts.

Budget functions as control devices and estimates of activity of the enterprise reveal only when predicted indicators are compared to the actual. Differently, at the end of the planned period it is necessary to make the report on activity of the enterprise in which predicted and actual indicators will be compared.



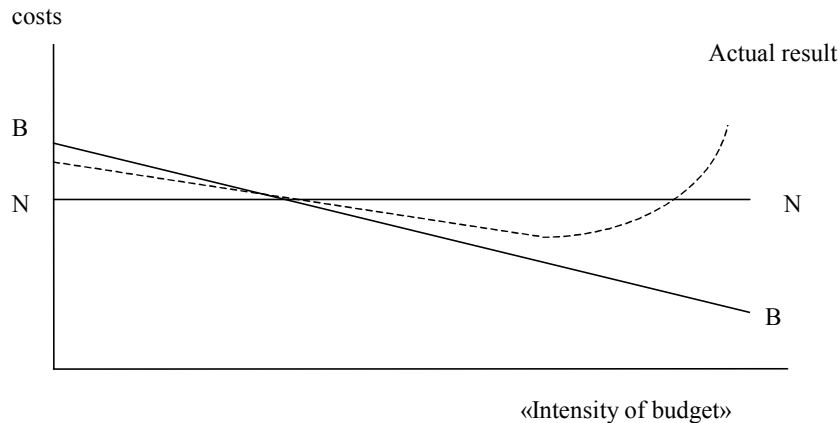


Fig. 3: Budgets and claims level

One of ways of effective use of budgets and standards as systems is more whole is to correlate them to personal claims of managers.

It should be noted, that when budgeting to the forefront there is a coordinated and motivated work of a large number of people which can't be realized without the adequate structural organization of activity and personnel management.

Structuring financial management on the basis of allocation of the centers of responsibility has to answer the purpose of financial management, differently activity of the enterprise can be inefficient. Thus, organizational structures have to change, be supplemented and be improved constantly.

Solutions of a structural problem offered by management in many respects are connected with introduction at the enterprises of system of the financial management, including development of financial structure of the enterprise, with allocation of the centers of the financial responsibility, defining the sphere of powers and responsibility of each division of the enterprise.

Management development on the centers of responsibility was affected by steady tendencies of development of organizational structures taking into account their integration, creation of holdings and flexible (adaptive) structures. It led to their complication and need of essential delegation of the rights and responsibility to managers of divisions. The competition influencing dynamism of all processes at the enterprise, need of continuous research and development to technology and production change, change of the markets of raw materials and sale, sharply increases number of administrative solutions of all types. As a result the central governing

body of the enterprise isn't able to process effectively a wide range of operational information, the need for management decentralization, distribution of powers and responsibility for made decisions amplifies. Important factor, extent of decentralization of management with investment of heads of the centers of responsibility with the right of an exit to a foreign market of resources and production (services) is. Extent of decentralization of management influences as giving of the status of the center of responsibility (it is responsible for expenses, the income, etc.) and a choice of system of indicators on which the assessment of activity of managers and employees of the center of responsibility is carried out.

The center of responsibility is a segment of the organization in which emergence of expenses, obtaining the income, use of investment means [8] is supervised.

From a management position division of the organization into the centers of responsibility has to be defined by specifics of a concrete situation and meet the following requirements: the centers of responsibility need to be coordinated to production and organizational structure of the enterprise; at the head of each center of responsibility there has to be a responsible person-the manager; in each center of responsibility there has to be an indicator for measurement of volume of activity and base for distribution of expenses; it is necessary to define accurately the sphere of powers and responsibility of the manager of each center of responsibility; for each center of responsibility it is necessary to establish forms of the internal reporting; managers of the centers of responsibility have to take part in carrying out the analysis of activity of the center for last period and drawing up plans (budgets) for the forthcoming period.

The account concept on the centers of responsibility provides application by divisions of the enterprise of various purposes and criteria of an assessment which most effectively stimulate the given divisions in economic activity of the enterprise [9].

Awarding of the centers of responsibility is connected with productivity of their activity defined through the mechanism of control. Financial control and productivity assessment thus are based on comparison of the budgetary indicators and actually reached indicators.

It should be noted, that at initial design of structure of the enterprise it is impossible to estimate for certain possibilities of divisions in respect of obtaining the additional income from transactions with the third-party organizations therefore giving to such divisions of the status of the centers of profit is a matter of time and estimates of their productivity during work.

By results of distribution of expenses, revenue and profit between centers responsibility creation of a final version of the scheme of organizational structure of management on the basis of the responsibility centers is carried out. On the basis of the allocated centers the financial organizational structure is formed by a method of a matrix projection of structure of types of the centers of responsibility and organizational structure of business management.

The financial structure of the enterprise for one of three options can be as a result created:

- it is identical to organizational structure of business management;
- in financial structure part of organizational links are integrated (for example, accounts department, planned and financial departments);

- in financial structure part of links of basic organizational structure of management are broken into components (for example, the sales department can be broken into some groups).

Indispensable condition of formation of the centers of responsibility is accurate definition of a set of functions, powers and responsibility of the manager of each center of responsibility.

Each center of responsibility has external relations with other centers of responsibility and operating system. Therefore, an important stage of creation of structure on the basis of the centers of responsibility is identification of interrelation of the center of responsibility as object of management, partner and subject of management. It is necessary to find out and describe as to whom from the managing director of system has to deliver the responsibility center as object of management as to whom it has to deliver as the partner. The logical analysis of importance, expediency of interrelations, the reasons of emergence of mutual claims, opportunities of their account and use is carried out at motivation. Recommendations about optimization of interrelations are formed.

Special value allocation of the centers of responsibility matters for the analysis of efficiency of introduction of innovative development in economic process of hi-tech productions. In table 1 functional distribution of tasks of an assessment of parameters of efficiency of strategy of innovative development [1] is shown. Apparently from the offered example, the division of research and development is offered to estimate possibilities of expansion of a patent portfolio at the expense of improvement of used technologies or

Table 1: Functional distribution of assessment tasks of efficiency parameters of strategy of innovative development

| Sub-division                                 | Marketing department            | Production department                     | Finance department               | Corporative management   | Personnel department |
|--|---------------------------------|---|----------------------------------|--|----------------------|
| <i>Estimation of innovation behavior</i>     |                                 |   |                                  |  |                      |
| Growth of patent portfolio                   | Growth of market                | Growth of goods                           | Growth of license income         | Growth of company price and its shares   | -                    |
| <i>Estimation of innovation activity</i>     |                                 |   |                                  |  |                      |
| Provision of intellectual property and asset | Mastering of new production     | Introduction of new technique             | Volume of innovation investments | -  | Personnel            |
| <i>Estimation of innovation process</i>      |                                 |   |                                  |  |                      |
| Qualification of scientists                  | Execution of marketing forecast | Achievement of production resource-saving | Expense of investment funds      | Effectiveness of innovation development and realization of projects in prescribed data | -                    |

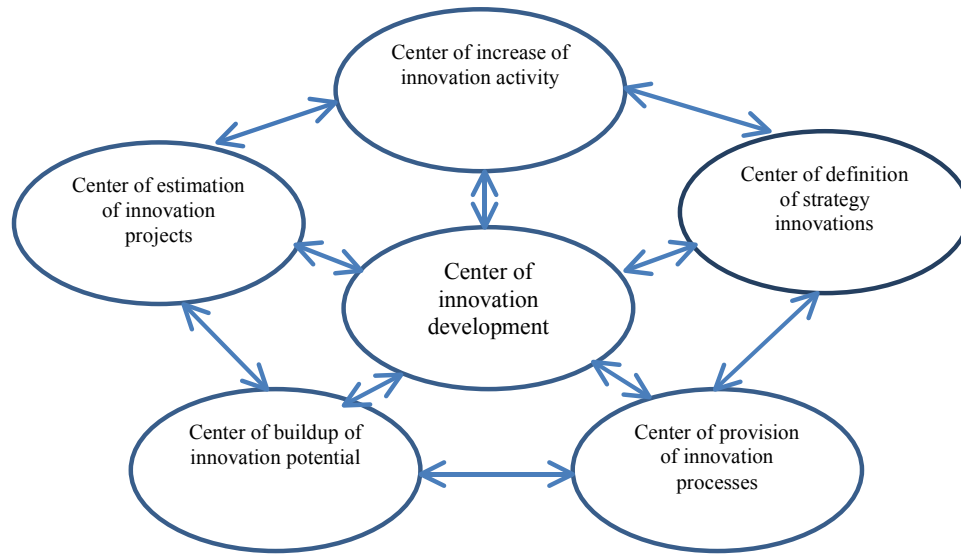


Fig. 4: Organization provision of innovation development on the basis of responsibility centers

formation of new development. Specialists of the marketing department estimate the amount of growth of a share of the enterprise in the market thanks to offered research and development to innovations. The corporate management (the director general, the director of strategic development) estimates influence and prospects of innovative development on growth of cost of the company and its actions.

The conclusions drawn by specialists of the relevant departments, then are analyzed and accepted by group of strategic development as a conceptual basis of innovative development.

On the basis of comparison of the developed schemes and the analysis of traditional obligations of services and departments of the enterprise it is possible to establish also the maintenance of the new duties caused by innovative development. So in the given example in table 1, when carrying out an assessment of innovative behavior definition of opportunities of growth of a patent portfolio is referred to the sphere of responsibility of research and development. At an evaluation stage of innovative processes this service will be responsible for determination of qualification of the shots on indicators of performance of NIR and OKR. Thus, distribution and systematization of functional duties allows to define a share of responsibility of departments and services in the course of innovative design and to reveal the responsibility centers (Figure 4).

As the coordinator the group of the strategic development new possible functions for which can become thus can act: ?

- organization of work on generating of innovative development;
- coordination of planned work, account and reporting, control of identification of strategic innovative reference points;
- development together with other centers of responsibility of the directions of innovative development;
- the methodical management of an assessment set and the analysis of the reached goals and problems of innovative development;
- consideration and preparation for the approval of innovative projects with the subsequent formation of a portfolio of innovative development from them;
- definition on the basis of a portfolio of innovative projects of indicators of short-term and long-term plans of innovative development;
- organizational and economic support at corporate level of investment support of innovative development;
- control of timely performance of actions for development and realization of strategy of innovative development, assessment of the reached economic growth and competitiveness; ?
- identification of positive and negative deviations from actions of innovative development, development of recommendations for further plans of development and realization of innovations.

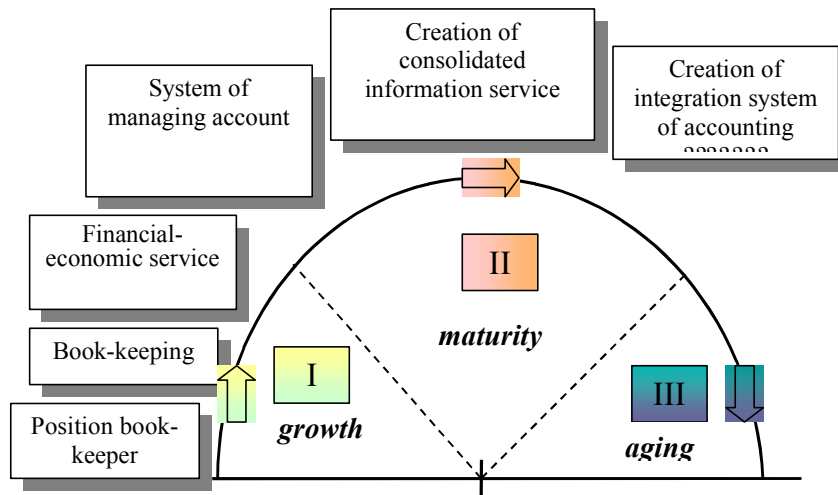


Fig. 5: Change of account system, depending on phases of innovation cycle of organization development

The center of increase of innovative activity is formed on the basis of research and development division. The head of the center bears responsibility for creation of research base, formation of the intellectual capital of the enterprise in the form of intangible assets, building of patents. Owing to a functional orientation of the activity this center doesn't participate in realization of scientific and technical development and only carries out their maintenance.

The center of definition of strategic innovations represents the structural division which head bears responsible the item  $\emptyset$  generating, selection and commercialization of perspective grocery and technological innovations. This center provides prospects of innovative development in the market and is created on the basis of marketing and/or sale service. He is responsible for selection of scientific and technical ideas from a position of their market demand and corporate competitiveness.

The appraisal center of innovative projects is created on the basis of financial and/or economical departments. Along with search of sources of financing by fundamental obligations of this center definition of an investment solvency of new or improving technologies and also creation of a portfolio of innovative and investment projects are.

The center of accumulation of innovative potential is formed on the basis of the production division which is carrying out introduction of new products. The head of this center bears responsibility for the economic growth of innovative production and also ensuring quality to grocery novelties.

The center of ensuring innovative processes represents the structural division which head bears responsibility for implementation of projects in the set terms. Such center can be created on base or with involvement of department of human resource management and to allocate it with the rights and duties on staffing, coordination and observance of calendar and network schedules of innovative processes, training of production workers in the skills necessary for work with introduced technologies.

Thus, distribution of the purposes and problems of innovative development between centers organizational responsibility, investment with their rights and duties creates organizational opportunities for realization of grocery and technological innovations and implementation of support of these processes at corporate level.

Statement of the integrated system of the account. Lack of effective control system at the certain scale of business leads to that resources on management don't suffice on the solution of problems and many organizations at some instant start feeling restriction of scales of growth. As show researches, despite great expectations, the management very often doesn't have will, time or attention to adapt this decision for new conditions.

The organization passes the various stages which change is connected with carrying out reorganizations in the development. They promote accumulation of knowledge, experience and abilities which reduce probability of a failure. Therefore, at the organization of system of financial management it is necessary to



consider these changes and to adapt to new conditions and phases of a cycle of development of the organization (Figure 5) [3].

The revealed dependence in many respects is defined by economic development of each production and dependence of functioning of all organization on this factor. Dynamism of system of financial management is caused by that it is influenced by constantly changing size of financial resources, expenses, the income.

Depending on a phase of a cycle of development of the organization the structure of distribution of responsibility and powers in all system of management and in an account subsystem changes also. The structure of system of the account changes at the same time with company growth. In particular there are the new functions defining interrelations with other divisions of the enterprise, duty regulations are formed, experts of the corresponding qualification are selected, technical and financial security, including providing with information technologies will be organized.

At formation of the organization there is a statement of system of the traditional financial account-forms of primary documentation are developed, document flow is formed. Depending on the size of the organization and volume of registration work the position of the accountant can be entered into structure of the organization, or the accounting service as the structural division headed by the chief accountant whom it is made responsible on establishment of the financial relations is founded. New tasks which are set for business in process of its development, demand emergence of new divisions in service structure. It is required not only conducting accounting, but also taxation optimization, formation of the internal reporting on the basis of which adoption of administrative decisions and also the reporting for owners of business would be carried out. As a result from department of accounts department the finance department is allocated.

For the internal account and adoption of administrative decisions only separate indicators of the management accounting in which implementation only the chief accountant is engaged in the beginning are used and then the small working group of the qualified experts possessing rather big powers and access to all volume of information is created. For this stage it is characteristic linear or linearly-functional organizational structure.

With increase in sales volume and organization growth registration information ceases to meet the requirements of internal management since it is intended first of all for external supervisory authorities. Therefore transition from separate indicators to statement of system

of management accounting and modernization of information system is necessary for increase of its efficiency. The number of departments grows and the organizational structure of the enterprise as a part of which the special financial service under the leadership of the finance director is allocated changes and also the centralized system of collecting and processing of operational information for management is created.

Decentralization of organizational structure, allocation of self-supporting divisions on a phase of stabilization results in need of the organization of services of management accounting not level of divisions and creations of the consolidated information system uniting these services [10]. The integrated control system covering all fields of activity of the enterprise is created.

The analysis of various options of the organization of management accounting allowed to mark out the following advantages of creation of system of the integrated account:

- Integration, i.e. transition from traditional methods of the account, planning, the analysis and control to uniform system of receiving, information processing and acceptance on its basis of administrative decisions it is focused not so much on the solution of tasks actually the account, how many on adoption of complex administrative decisions.
- Consecutive integration can give economy of financial and administrative resources as excludes duplication of functions of the account.
- Source of economy is also the principle of gradual introduction of system of the account. Observance of conditions of gradualness and integration is necessary and during automation-a final and inevitable stage in creation of modern registration system.
- The problem of comparability of data of different systems of the account, causing uncertainty in their reliability is removed.
- The uniform system of accounts of management accounting, besides improvement of information service of various administrative structures, creates conditions for preservation of a trade secret about level of costs of production, profitability of separate types of products. For preservation of a trade secret on accounts of the financial account the balance is registered only and the turns showing economic operations, are reflected in system of management accounting. Data transmission from one system in another is carried out through specially allocated transfer accounts.

The best way of transformation of accounting in the integrated account is a consecutive structurization of the enterprise: transition to financial structure and allocation of the centers of the financial account; control of system of analytical signs which allows to keep account with the set depth and necessary specification; development of regulations of representation and information processing and actions of all services on performance of registration functions; development and realization of policy of accounting and management accounting as a whole.

Emergence of system of internal reports for the managers made in the necessary formats for them and depending on their functional duties and the status has to become the main result of statement of the integrated account in the company. These reports can contain information and on financial statements and on the financial analysis and on a condition of debtors and creditors and by results of market research and on a course of realization of production operations-that is that package of information which is necessary to the head on this place, but always on the basis of a common information space, uniform information and organizational regulations.

Implementation of similar systems is impossible without automation. The matter is that creation of the modern enterprise are the two interconnected processes. The first-formation of the production and administrative structure generating powerful flows of information. The second-formation of the structure operating these streams that it is accepted to call complex automation.

### CONCLUSION

In summary it should be noted two moments, important systems at the organization of financial management by the hi-tech innovative enterprises. The financial system of the company becomes complicated in process of its development. There are extensive opportunities for application of all modern receptions and corporate technologies. Probably further branching of a financial system, complication of relationship with numerous firms and branches. But it is necessary to sustain the basic principles of the organization of financial services, first of all their efficiency, focus on management process and profitability.

Development of a financial system possibly in one direction. It is a question of innovative development of the enterprises. Carrying out development and realization of innovations, the enterprise creates thus not only important for the competitiveness market advantage,

but also objects of industrial property. Introduction of non-material assets in economic circulation and management of them allows not only to protect business, but also will increase enterprise cost, having increased the sizes of assets and having provided itself additional sources of monetary receipts, for example, at the expense of sale of licenses. Financial management by investment projects-from researches to a transfer of technologies brings the company to absolutely new level of work, becomes base for its further growth, showing before the hidden reserves of increase of efficiency of the enterprise.

### REFERENCES

1. Taburchak, P.P. and A.P. Taburchak, 2011. Efficiency of innovative development of technologically focused enterprises: Monograph. / P.P. Taburchak, A.P. Taburchak, -SPb.: pp: 261.
2. Brigham, E.F., L.C. Gapenski and P.R. Daves, 1999. Intermediate Financial Management, Dryden Press, 6<sup>th</sup> Edition. The Dryden Press Harcourt Brace College Publishers, pp: 1123.
3. Gogua, L.S., 2009. Formation of effective administrative structures of the enterprises. Monograph. / H.p. of Gogua.-SPb.: Synthesis, pp: 117.
4. Upchurch, A., 1998. Management Accounting: Principles and Practice. Financial Times Management, pp: 640.
5. Horngren, C.T., G. Foster and S.M. Datar, 2003. Cost accounting: managerial emphasis. Pearson Education, Limited, pp: 928.
6. Kondrashova, E.A., A.R. Mamatkazin and A.P. Taburchak, 2012. Finance, monetary circulation and credit: Manual for call / E.A. Kondrashova, A.R. Mamatkazin and A.P. Taburchak, Spb., pp: 227.
7. Kaplan, R.S. and D.P. Norton, 1996. The Balanced Scorecard: Translating Strategy into Action, 1 edition. Harvard Business Review Press, pp: 336.
8. Drury, C., 2005. Management Accounting for Business Decisions, 3 edition. Thomson Learning Publisher, pp: 549.
9. Taburchak, P.P. and E.A. Kondrashova, 2012. Bases of financial management. Manual second edition) / P.P. Taburchak and E.A. Kondrashova. Spb.: pp: 145.
10. Management accounting, 2009. manual (Bachelor degree) / under editorship of Prof. Ya.V. Sokolova. M: Master, pp: 428.