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"Kharkiv Polytechnic Institute"

INNOVATIVE ENTREPRENEURSHIP

Textbook

Edited by Prof. Olga Savchenko

In the framework of the project 530278-TEMPUS-1-2012-DE-TEMPUS-JPHES «ICo-op»: «Industrial Cooperation and Creative Engineering Education based on Remote Engineering and Virtual Instrumentation»

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The textbook is prepared by a team of authors who are participants of the international TEMPUS Project «ICo-op». The textbook contains materials for studying of key components of modern innovative entrepreneurship: organization forms of innovative enterprise, methods to HR management and practical applications of creative thinking, forms and strategy of bussines – planning, innovation management in enterprise, management & protection of intellectual property and formation of the risk management approaches.

For students and teachers of Universities and for entrepreneurs-innovators.

Project 530278 – TEMPUS – 1 – 2012 – DE – TEMPUS - JPHES «ICo-op»: «Industrial Cooperation and Creative Engineering Education based on Remote Engineering and Virtual Instrumentation»

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PREFACE

In terms of the global economic space efficiency of the economy, scientific and technological level of production, socio-economic progress depends on the amount of accumulated knowledge society and efficient use of intellectual resources. The world economy is a constant increase in the importance of the impact of innovation. The intensification of scientific and technological progress and trends inherent in the present stage of economic development suggest that the type of innovation will be decisive, and the economy, respectively, becoming more innovative. That's why competitive can only be innovative, that is knowledge-based, high-tech economy. This economy needs the development of innovation, entrepreneurial ecosystem, particularly its specific variety - innovative entrepreneurship.

Innovative entrepreneurship should consist of four main components: ideas, entrepreneurial experience, funding and community that unites them in a whole.

Research innovation business, defining its place and influence on the evolution of the economic system of society requires an integrated system approach makes more detailed study of entrepreneurship. It is important to report student youth of diverse aspects of the formation of the modern concept of business, including innovation.

Textbook reveals the evolution of scientific views on innovation and innovative entrepreneurship, the essential content of "innovation", "innovation", "risk management" as economic categories, analysis of the innovation process, areas for innovation business structure motivational core entrepreneurship approaches to the development of HR and determining issues of rights protection and commercialization of intellectual property.

Also disclosed features of the main forms of economic organization and innovative entrepreneurship, including the preparation of investment proposals, business plans and the development of creative thinking.

Activities associated with future managers work with people who always aimed at strengthening and better use of the creative potential of the team, as well as the activation of their intellectual abilities and entrepreneurial talent.

There is a contradiction between the constant growth of knowledge and a high level of creative students. Several researchers noted that the development of intellectual and creative potential of young people is on the lower level of the average norm. At the same time determined that the high rates of creative potential and personal qualities of future managers influence the propensity for entrepreneurial activity and self-realization.

The program of formation of creative potential of future business, specializing in

innovation activities shall include the following areas: gaining skills to build creative thinking; studying methods to solve non-standard business objectives; ability to apply creative approach to the forms of management.

Introduction to the educational process innovative entrepreneurship activates learning and skills, as by the use of qualitatively different methodological approaches developed entrepreneurial potential.

Learning the appropriate course in turn, requires a completely different approach, based on personal development.

Thus, the study innovative entrepreneurship actual research questions are the characteristics and laws of innovation development of economy and economic policy issues that relate to the innovative nature of the economy and reduction of business risks.

Practical use of the textbook is aimed not only at the traditional student audience in related disciplines and to improve training programs at universities to closely higher education to the modern needs of the practice in innovation activity, but also for training programs for representatives of business, academic and government institutions in the context of the formation of modern competences activities in the "knowledge triangle": universities - enterprises - the state, including the development of institutional and organizational forms of integration of science and industry for the creation, implementation and diffusion of innovation.

This book is compiled on the basis of transversal modules developed in the framework Project 530278 – TEMPUS – 1 – 2012 – DE – TEMPUS - JPHES «ICo-op»: «Industrial Cooperation and Creative Engineering Education based on Remote Engineering and Virtual Instrumentation» из National Technical University “Kharkiv Polytechnic Institute” (Ukraine), Ilia State University (Georgia), Zaporizhzhya National Technical University (Ukraine) and State Engineering University of Armenia (Polytechnic) (Armenia). *The authors of the textbook:*

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Section 1

ORGANIZATIONAL FORMS OF INNOVATION ACTIVITIES

1.1 The term "Organization of Innovation". Forms of Innovations

The term "organization of innovation" is used in four meanings:

- As a subject of innovation activity, i.e. the union of people, who jointly implement the development, introduction, production and commercialization of innovations;
- As the combination of processes and actions of innovation organization designed to meet the objectives of innovation activities;
- As the structures of innovation organization which provides the orderliness and interaction of its components and subsystems;
- As an element of innovation business infrastructure.

Most often, this term is used referring to the last two meanings. Thus, **innovation business infrastructure** means a set of organizations providing services for the innovations development; examination of innovative projects and programs; introduction, commercialization, transfer of innovation, etc.

The forms of innovation organization are diverse; the innovation processes can involve many participants and be implemented at the company, intercompany, regional, national and international levels (Table 1.1).

In the context of planned economy in the structure of organizational forms of innovation activities, there were the domination of **industrial scientific and technical centers**, which now are mainly concentrated in the defence sectors of industry. Regional associations and centers combine scientific, industrial and financial enterprises of the region. For example, the **innovation center** as a technologically active complex with the established integrated infrastructure of innovation can combine universities and other higher educational institutions with scientific and industrial firms.

Table 1.1

Organizational forms of innovation activities

Sectorial	**Regional**	
Scientific and technical centers: Scientific and technical centers: research institutes, design centers, laboratories, research stations	scientific parks technology parks technopolises innovation centers Center of Industrial Technologies University and industrial center Engineering centers at the universities	
Intracompany	**Intercompany**	**Intercorporate companies**
Typical innovative formations: - Temporary creative teams; - Innovatory teams; - Venture units; - Venture subsidiaries; - Business incubators	alliances consortia joint ventures	Program-targeted Scientific and technical

Regional innovation center can be of a complex structure, including scientific and technological parks, technopolises, incubators of innovations, etc. Scientific parks, technology parks and technopolises are designed to develop and implement countrywide innovative programs.

Technology park **-** hierarchically organized system of relatively independent centers, each providing a specialized set of services for the innovations implementation (See Fig. 1.1).

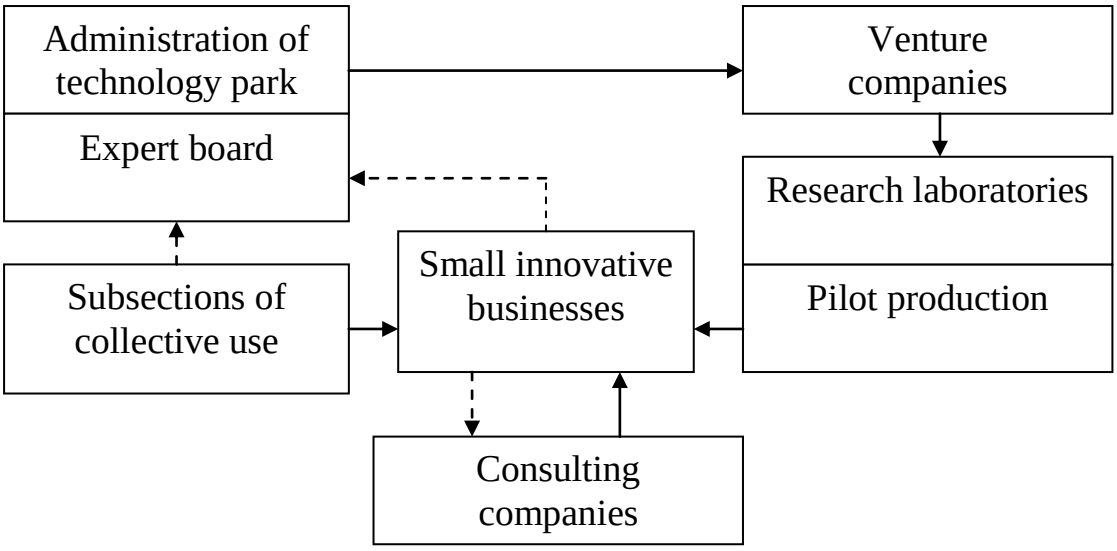


Fig. 1.1 – Structure of technology park

Scientific park **–** is a combination of scientific and intermediary organizations that implement the various aspects of innovations based on specialization and cooperation in the area of scientific research and developments.

The state and municipal authorities take part in the management of technology park. The state forms the legal framework, develops and implements the funding programs. It can also provide small science-based companies with various quotas and subsidies. Local government provides the conditions for technology parks functioning: it is engaged in personnel and information support and has coordinating functions.

At the levels of technical parks, the ***incubators of innovation business*** (business incubators) are created – an economical and legal space where the preferential taxation can act, venture capital financing is common and intermediary services on innovations are provided (technical appraisal, marketing, information support, management consulting, licensing, etc.). The objective of business-incubators functioning is not the innovations themselves but the promotion of small innovative enterprises.

The term "business-incubators" can also be referred to the firms established by big enterprises or local authorities. They provide consultations on administrative, technical, commercial and marketing services, lease space or equipment on preferential terms. Firms-incubators are divided into three types: non-profitable – the most numerous group, profitable, which quantity is quickly growing in all countries and the established at the premises of HEIs (See Table 1.2).

Table 1.2

Types of firms implementing the programs of business-incubators

Non-profitable	**Profitable**	**Branches of HEIs**
Subsidized by local authorities. Tenants (customers) are industrial, design and service organizations. The rent payment and other rates are by 15-50% lower than average level.	Are private organizations. Do not offer reduced rates. Provide the tenants with wide range of custom-tailored services. Tenant may select any range of services and order the additional.	Assist the companies, which implement technologically sophisticated innovations. Offer services of scientific nature (from intellectual and informational up to laboratory and technical).

Small innovation enterprise at the business-incubator of a technical park or at the firm-incubator is in a formative stage, which decreases its costs and provides intermediary and consulting services. During the period set forth in the agreement (it is usually from 3 to 5 years), it pays lower rent for space, uses assistance in the field of innovations management and access to the network of legal, accounting, marketing and informational services.

The combination of scientific and technology parks, business incubators and other organizational forms of innovation business is incorporated into the city structure and forms the ***technopolis***. Its vital activities and development are defined by advanced and diversified innovation infrastructure.

In the technology parks and technopolises there is the possibility of pooling of capitals of state, commercial banks, industrial enterprises, venture and charity funds and personal savings for the implementation of innovations. Thus, the associated risk spreads proportionally among all creditors, the commercialization of innovations accelerates, new workplaces are created and the innovation component of the regional and national economy increases.

The special role in the infrastructure of innovation business is played by ***venture funds*** (funds of venture capital financing). They are formed from the capital of corporations, bank credits, pension capital funds and personal savings of citizens. Venture fund buys the parcel of shares or the share of the authorized capital from innovation enterprise that allows it to influence the company's activities. With its success, the fund receives high profit, since a tenfold increase in capital (initial investment) within five years is considered the bottom of innovative organization profitability.

In addition to the described organizations in the innovation entrepreneurship, there are ***firms on innovation implementation*** - intermediary and consulting business organizations performing two types of service work for innovative enterprises: a) diagnostic analysis of the company's activities and scientifically based offer of corresponding innovations; b) marketing research, advertising of innovations, consulting and engineering work.

The last trend in the development of organizational forms of innovation business is the establishment of ***engineering centers*** within the interbranch scientific and technical complexes. They are based on the target creative groups of scientists, manufacturers and marketing specialists. The engineering centers usually solve the significant scientific and technical issues with high efficiency within a short time. In fact, they are small innovative firms that as a cooperation use strong financial, material, technical, and organizational support of large corporations.

1.2 Role of Small, Medium and Big Businesses in the Implementation of Innovations

The academic and university sector usually plays the leading role at the stage of scientific research and development. Small business is also important at this stage of innovation cycle. At the stage of pilot production, marketing and distribution the leading role goes to different-scale businesses, but mostly to small businesses. It successfully competes with big business by taking advantage of the speed and flexibility, as well as the strategy of filling niches that cannot be occupied by more powerful competitors.

Since the production and diffusion of innovations require significant industrial, technological and information resources, this stage of the innovations life cycle often serves as the area of medium and big businesses activity. It does not mean the diminution of the small business role: at any stages of innovation implementation, small and medium enterprises can be subcontractors of big firms and provide support and services for large businesses.

Thus, the differentiation of labor between small and big business is due to the difference in expenditures at different stages of the innovation life cycle. At the early stages – from finding of idea to innovations launch, when large financial and human resources are not required, the small businesses dominate. In this case, according to published data, their costs of similar results obtaining is less than in large companies (See Table 1.3). Therefore, small businesses are focused on phase of innovation launch, while big ones – on mass manufacturing, which is the next step after market practical approval.

Table 1.3

Distribution of costs on innovation by development stages (in %)

Development stage	Big enterprise	Small enterprise	Private enrepreneur
Search of idea	1,6	0,3	0,1
Processing of concept	3,2	1,8	0,4
Laboratory test	0,8	0,9	1,0
Market test	16,0	9,0	5,5
Product realization	78,4	88,0	3,0

For large enterprises, the mastering of new products means much greater risk than for small enterprises, as it diverts resources from standing at the familiar tapped markets and may contribute to price drop. For small business, the innovation strategy is the main way to improve competitiveness under the conditions of monopoly price, large scale of production and marketing, typical for big firms. Therefore, small and newly created enterprises should prevail in innovation industry in oder to support the high rates of development. It creates the preconditions for interdependency and complementarity of small and large businesses. The forms of their interaction are various intercompany alliances:

1. ***Consortia*** provide joint funding, research-and-development activities, development of technologies and standards. The research results are distributed among the participants for their future independent use. Types: a) consortia with permanent staff, its own research centers and laboratories; b) corporate and university consortia (corporations finance, universities conduct scientific and technical research).

2. ***Joint ventures*** are established for joint development of technology, production and sales of new products. Reach of the production and marketing areas helps to reduce competition at the marketing stage. In ecenomically developed countries from 1/3 to 1/4 agreements are constituted.

Besides alliances, there are ***business associations*** – sectoral business associations that aim to defend and protect the interests of innovation business in the political, economic and regulatory areas.

1.3 Properties and Organizational Structure of an Innovative Enterprise

Intra-organizational structure of innovative enterprise is a combination of departments and offices involved in the development and implementation of managerial decisions in the field of innovation. Design of innovation organization frameworks is usually considered by levels “organization – environment” and “subdivision – subdivision” and “employee – organization”.

An innovative organization should have the system of characteristics that are most appropriate to the conditions of market rivalry. (See Fig. 1.2).

At the “organization – environment” level, it is recommended to use ***systematic approach***. It assumes:

- Weak or moderate use of formal rules and procedures;
- Decentralization and significant degree of staff participation in decision-

making;

- Broad delegation of authority and responsibility;
- Small number of hierarchical levels;
- Flexible use of large array of management techniques.

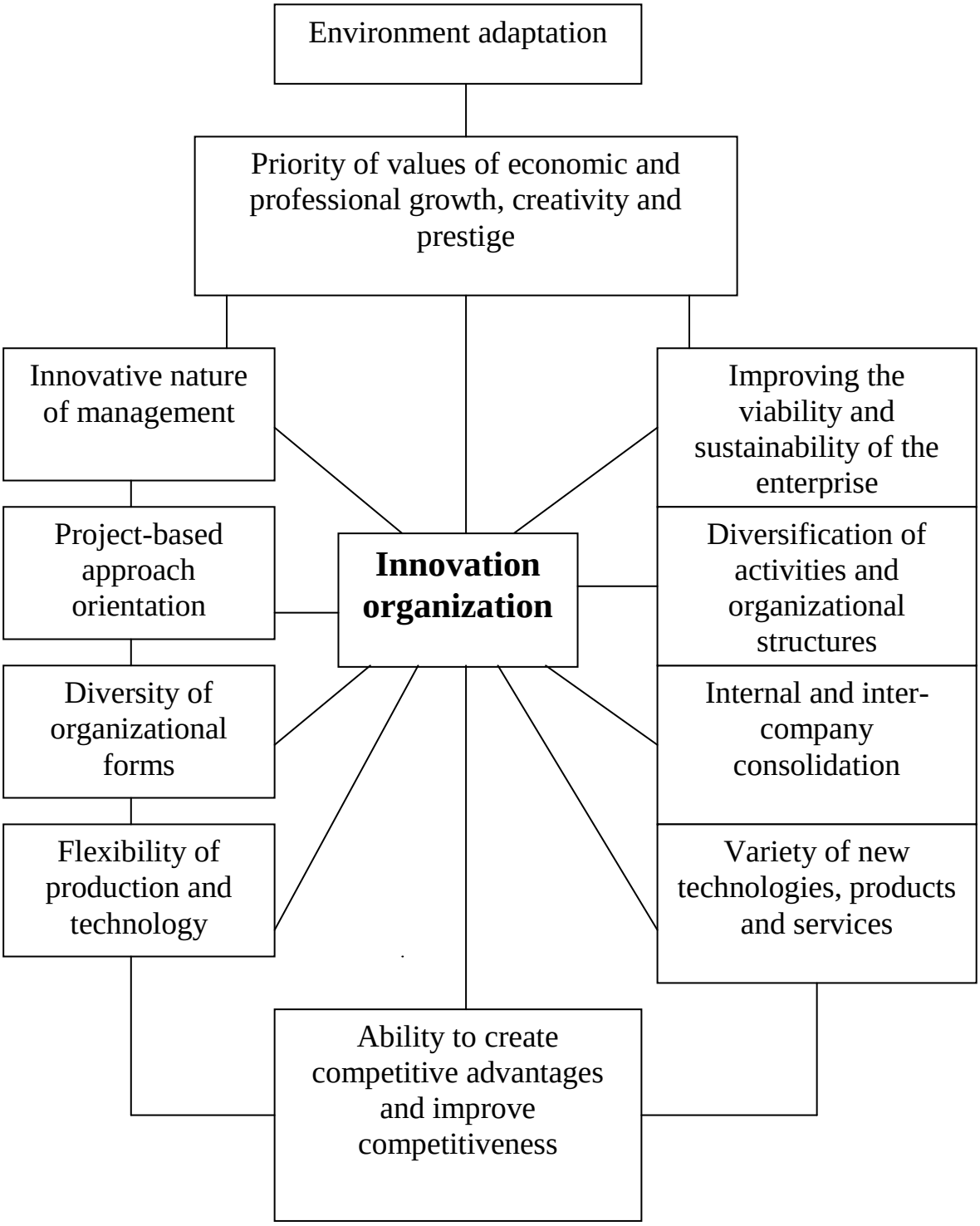


Fig. 1.2 – Characteristics of innovation organization

The condition for the successful implementation of the systematic approach is the high level of employees' motivation and the low profile of formal control.

At the "subdivision – subdivision" level, the divisional and matrix structures are applied, which are traditional for management. ***Divisional structures*** are often used in big enterprises: a) in the context of multicommodity production; b) in conditions of simultaneous realization of several innovative projects. ***Matrix organizational structures*** are based on program management, permanent complex groups and temporary targeted creative teams. The main limitation of matrix structures is the possibility of imbalance between two formal schemes of organizational structures – linear-functional and target-oriented.

At the "employee – organization" level, the basic principle of interaction organization is free, open and voluntary associations of people. The relationships between employees are built on the combination of competition and cooperation. The organizational basis of this is the replacement of stable hierarchy by the principle of interests' combination of all employees within each department and organization as a whole. It is possible under ***adhocratical organizational structures*** (from Engl. 'Adhocracy' - special, arranged for this purpose), where the performers choose the means of objectives implementation by themselves and the decision-making is based on expert opinion.

Matrix intracompany structures of innovative business can be formed as ***multidimensional organizations***. This is organizational structures representing an independent workgroup or target creative team, which combine work focused on the optimum utilization of resources and the results obtaining with the work for the market and consumer. Although multidimensional organizational structure are focused on profit, their main strategic objective is self-development and development of the enterprise as a whole (Table 1.4).

The basis of innovation activity organization can be ***participatory organizational structures***, based on the right of all workers to participate in the management process.

In case if big enterprise implements innovations at all stages of product life cycle, it is possible to use ***problem and target structure*** – highly complex system covering asset and manufacturing complex, financial, control, social, informational and legal subsystems (See Fig. 1.3).

Innovation enterprise can also be organized as ***program-oriented structure*** (See Fig. 1.4). This type of structure is targeted at first phases of innovation life cycle (from development of innovation till its launching).

Table 1.4

Multidimensional organizational structures of innovative organization

Main tasks	**Interaction with the management of enterprise**	**Benefits**
1. Provide productive activity with necessary resources 2. Manufacture the product or service for a specific market or customer 3. Service for particular customer, penetration to a specific market, conducting an operation in a particular area	1. Granted the status of profit center 2. In some cases, they can be independent organizations 3. In both cases are imposed by intrafirm taxes 4. Enterprise managemenr invests the funds into multidimensional structures 5. Budgets for subdivisions are developed by subdivisions themselves 6. In general, relations with the organization management do not differ from relations with foreign customers	1. The transition to the new project does not require the structural reorganization, only the redistribution of resources 2. Subdivisions can be developed, modified or eliminated without serious changes in other subdivisions 3. While maintaining the strategic role of management, the optimal conditions for the delegation of authority are formed. 4. The direct measure of subdivisions efficiency is represented by profit, which prevents the simulation operation, in management as well

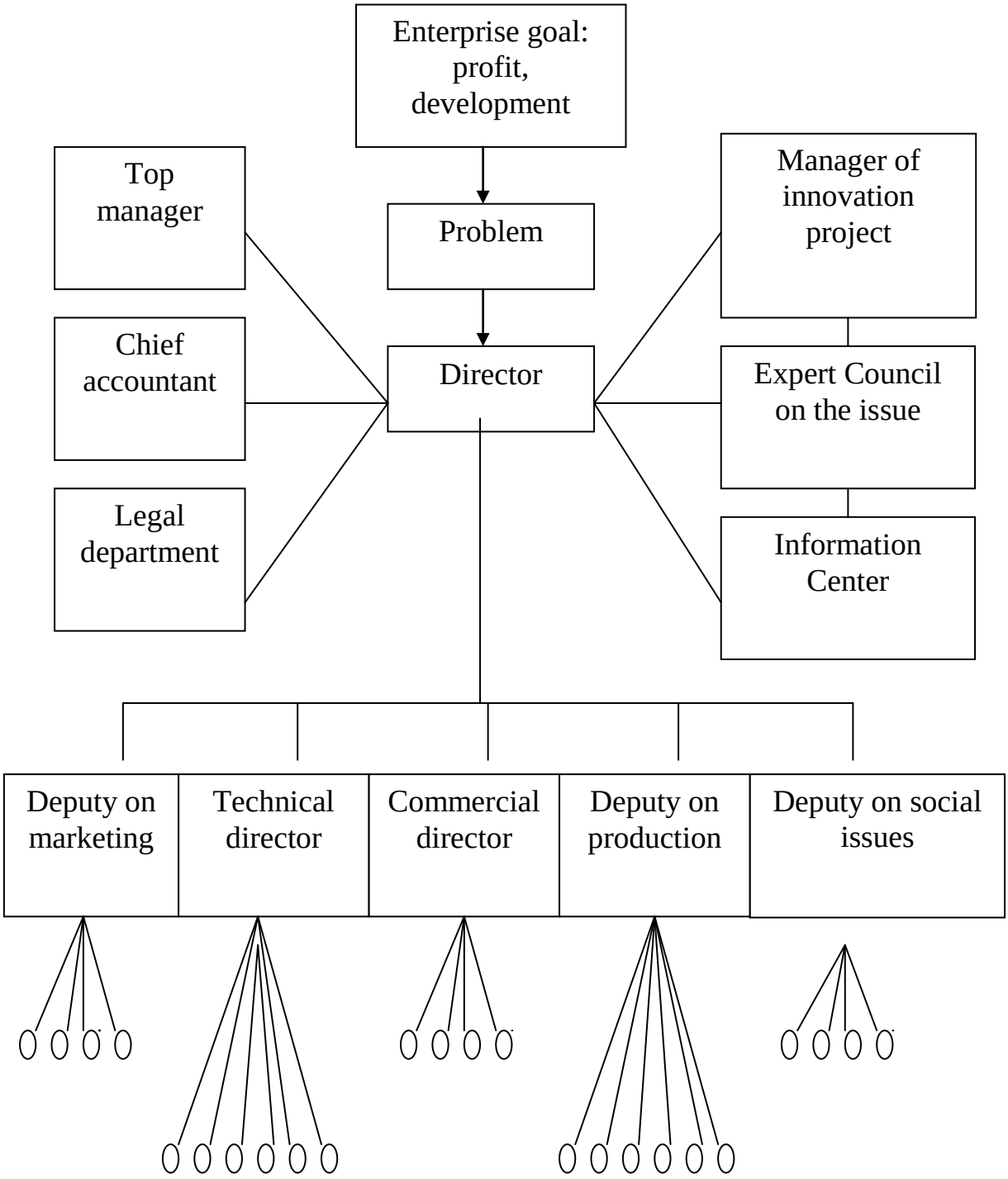


Fig. 1.3 – Problem and target structure of large innovation organization

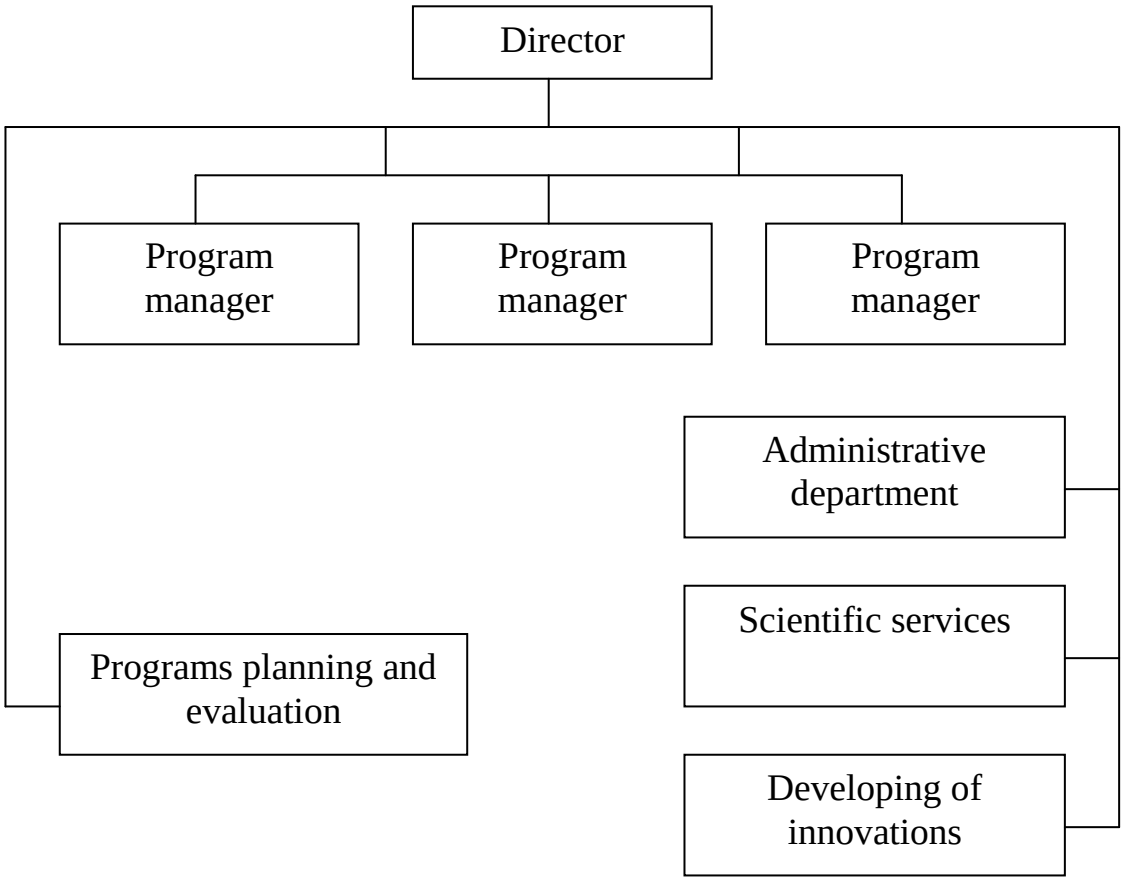


Fig. 1.3 – Program-oriented structure of innovation organization

Number of subdivisions, their structure and principle of interaction depends on the type of innovation organization, complexity, scale of output and production range, sales volume, speciality level, combination of production and some other factors.

Section 2

INNOVATIVE VENTURES

2.1 Essence of Innovative Ventures

Innovative ventures is defined as the process of creation and commercial exploitation of technical and technological innovations. Business activity is usually based on innovation connected with product or services, which allows entering a market and meeting new demands.

Innovations is the specific instrument of entrepreneurship, and not on their own but organized and directed search of innovation, continuous focus on them by enterprises. P. Drucker notes that "entrepreneurs are distinguished by innovative thinking. Innovation is a special tool of business activity".

Thus, the task of the entrepreneur-innovator is to reform and revolutionize the way of the production through the introduction of inventions, and more generally – through the use of new technological possibilities to manufacture innovative products or old products using new methods, due to the discovery of raw materials' new sources or new market of finished products - until the reorganization of the former and the creation of new industries.

Innovative entrepreneurship is a special innovative process of creation of something new, a management process based on a constant search for new opportunities, focus on innovation. It is connected with the entrepreneur's willing to take the entire risk of the new project implementation or existing project improvement and bear the financial, moral and social responsibilities. In general, innovative ventures can be defined as a public technical economic process that leads to the creation of goods (products, services) with better properties and technology by the application of innovations. In the economic literature, there are three main types of innovative ventures:

1) innovation of goods;
2) innovation of technology;
3) social innovations.

The first type of innovative ventures – innovation of goods – is the process of updating the supply potential of the enterprise, ensuring the survival of the company,

increase of profits, expansion of market share, customer retention, strengthening of independent position, increase of prestige, providing employment, etc.

Other type – innovation of technology – is the process of updating the industrial potential targeted at work productivity and saving the energy, raw materials and other resources, that in its turn provides an opportunity to increase the firm's profits, to improve the industrial safety measures, to take measures on environmental protection and effectively use the Intracompany informational systems.

The later type of innovative ventures – social innovations – is the general process of systematic improvement of humanitarian sector of enterprises. Implementation of such type of innovation expands the work force abilities in the market, mobilizes the staff of the enterprise on the goals achieving, and strengthens the credibility of social obligations of the enterprise to employees and society as a whole.

Based on the method of the innovation process organization in the firm, there are three models of innovative ventures:

1) innovative ventures on the basis of internal organization, when innovation is created and (or) developed within the firm by its specialized units based on planning and monitoring of their interaction on innovative project;

2) innovative ventures on the basis of external organization through the contracts, when a request on creation and (or) mastering of innovation is implemented by external companies;

3) innovative ventures on the basis of external organization using ventures, when a firm in order to implement an innovative project establishes subsidiary venture firms that attract additional third-party funds.

The second model of innovative ventures is most commonly used – the firm places a request on innovations development, and masters them on its own (requests such as "turn-key" are possible). The relative rarity of the first model use is explained by the lack of potential scientific research results in a business environment.

The basis of all kinds of innovative ventures is the creation and mastering of new products (goods and services), values and wealth in the broadest sense. The main and crucial part of such enterprise is the creation and production of scientific and technical products, goods, works and information, spiritual (intellectual) values, which are to be sold to consumers.

To master and produce new kinds of goods (products, services) the enterprise needs current assets in form of materials used in the creation process of scientific and technical production; energy required for material processing and other resources. In addition, component parts, semifinished goods, which can be used in the manufacture of scientific and technical products, can be required. * An entrepreneur buys the required materials, raw materials and components (M) from suppliers by paying their cost (Mm). To manufacture the scientific and technical products (goods and services)

an entrepreneur also needs capital assets (CA) in the form of buildings, premises, special-purpose equipment, outfit, tools, etc. An entrepreneur can buy or rent them. CA needed for innovation activities should be paid with a sum of money (MC), the amount of which depends on the type and quantity of CA required for activities and its cost. To implement the innovation activities, an entrepreneur needs to involve scientific-and-technological community, fabrication personnel, i.e. labor power (LP) spending certain financial resources (Fr). The result of innovation activity is finished goods (product or service) (G) sold by an entrepreneur to a customer of innovation product for a price (Mg) containing production expenditures and entrepreneur's profit.

Business activity as a process involves four stages: search of new ideas and their evaluation; business plan development; search of the necessary resources; and enterprise management. For innovative ventures, it would be better to divide these main four stages into more detailed ones. The diagram presents a logical chain of the main stages of the innovative ventures development during innovation product development:

Formation of innovative ideas
↑
Selection of the most promising ideas
↑
Detailed development of conception and its expert assessment
↑
Development of all parts of a business plan for selected ideas
↑
Expert estimation of a business plan
↑
Pilot production and testing of the product in the market
↑
Scheme adjustment of production and **sales promotion**
↑
Start of goods massive production and **its market promotion** based on the revised scheme

The first stage - the search of new ideas - acquires the great significance for innovative ventures. Implementation of business activities is always based on some specific ideas. An entrepreneurial idea based on activity and strong, thoroughly considered innovative initiative of an entrepreneur, can include both the production process as a whole, and one or more of its parts.

It is necessary to identify the main directions of the entrepreneurial activities possible for the idea implementation that will lead to full or partial update of the enterprise:

- Change of production management system;
- Application of new techniques or technologies;
- Application of new more efficient or durable materials in the production of goods;
- Improvement of design, package of goods;
- Fundamentally new scheme of advertising campaign organization of an enterprise, etc.

However, the innovative nature of the business company activities can occur in relation to not only the factors of production, organization of the production process or the product itself, but also to the placement of people participating in the production process.

In this case, the business idea can be based on the following actions:

- partial or complete replacement of all involved in the production process in order to “remove” low-skilled workers;
- creation of “special spirit” in the team by mobilizing actions, motion stimuli, motivation system for such purposes;
- taking actions for each employee to use their time effective, etc.

Thus, innovative idea can be described as existing opportunity of production of the original goods, products, services or their improved versions or modifications, and new brands. It is important for entrepreneur to select the information sources that will help him to find specific innovative idea. Such sources could be specific knowledge: on market and its needs; emergence of new technologies, materials and production methods; existing structural or geographical gaps in provision of some particular commodity.

Specific sources of innovative ideas:

- consumers, study of consumer demand;
- scientists, when they are engaged in the invention or search of new materials, product characteristics, which may lead to the creation of original or improved versions of commercial products and services;
- competitors, in some cases their work aiming to study consumer demand may encourage entrepreneurs to form their own innovative ideas;
- commercial agents, dealers and other intermediaries;
- entrepreneur’s consultant on certain elements of innovation activities;
- direct employees of the company.

In some firms the enterprise personnel is extensively used as a source of innovative ideas. In this case, special techniques are applied to stimulate staff

activities for new products development; including frontline workers in the process of the innovative ideas generation.

Peter Drucker's classification of innovative ideas sources:

- unexpected event (for the company or industry - unexpected success, unexpected failure, unexpected external event);
- non-congruity - dissonance between actual reality and our perceptions of it ("this is what it should be");
- innovation based on the process needs (process needs mean those flaws and "weak spots" that can and should be removed);
- sudden changes in structure of industry or market;
- demographic changes;
- changes in perception, attitude and value system;
- new knowledge (both scientific and unscientific).

According to P. Drucker, systematic innovation process is a purposeful and organized search of changes and the systematic analysis of these changes as sources of social and economic innovations. The first four innovative ideas sources (range of variation) are referred to the internal ones, as they are within an enterprise, industry or service sector; such sources are available to employees of this enterprise or in the field. The last three sources are referred to the external sources of innovative ideas, since their origin is outside the company or industry. However, there are no clear boundaries between all sources and they can mutually overlap. Should be noted, that although none of the areas is more important than others, P. Drucker arranges them in descending order of analysis probability and predictability.

After the formation of innovative ideas, a business firm is up against the task of selecting the most promising ideas. When choosing an innovative idea, the entrepreneur must consider not only the need for this project, but the reality of its implementation, because a good innovative idea may turn out to be impossible.

Before a business firm decides to introduce some innovation implementation, the following points are to be cleared. First, determine whether a product has good chance in the market (in the case of product innovation). For this analysis, foreign economists recommend to answer the following questions:

- Were there the grounds to find new product ideas?
- Is there a need to create a new product?
- Is there a need to replace one product by another?
- Is a new product an organic continuation of previous variety of products?
- Is the firm able to create an idea of new product release or obtain such product at all?
- Will the firm be able to sell such product?
- Does the new product fill some niche in the market?

- Can a new product be characterized as progressive or nostalgic, namely “retro syle”?
- Has anyone implemented similar ideas before and if has, how successful was it?
- Can competitors think up of similar ideas of new products?
- What is a financial risk of a new product idea?
- Can a new product idea have advertising success?
- Which market should be a new product idea targeted on?
- Does a new product idea correspond to intraproductive structure of a firm?
- What are the real market chances of a new product idea implementation?

Secondary, while the final decision taking considering an innovative idea, including design and research work, two more questions should be answered: on real profit and real risk. The answers to these questions are as follows:

A. Project income should be significantly higher than the its implementation expenses.

B. Project risk should be within critical allowable ratio with its sales profit.

Moreover, even the most promising idea does not guarantee automatic market success to an innovative company. To achieve their goals and gain profit from innovation activities, business firms should hold to certain terms and meet certain requirements.

1. The volume of potential customers’ demand on innovation, its economic advantages over existing facilities of filling the need should be well known. Need to identify the resource constraints that arise in the development, manufacture and marketing of innovations, t. T. Important to make a forecast of the economic potential of innovation. The resources limitation emerging during the creation, production and distribution of innovation should be defined, i.e. it is important to make a forecast on economic growth of innovation.

2. The mandatory condition for successful development of innovative ventures is enterprise personnel compliance with the certain requirements. The important factors for the firm success are age of firm founders (average 30-35 years) and their personal qualities: high capacity for work, communicability, purposefulness and expert knowledge.

3. With limited material and financial resources and market uncertainty, the significant part in the innovative ventures development is played by the quality of organization and management. In this regard, small innovative ventures are most effective, since they do not have strictly formalized management structure providing quickness and flexibility of decision-making.

2.2 Innovations Classification

Depending on the technological parameters, innovations are divided into product and process.

Product innovations include use of new materials, new semifinished articles and components; obtaining of fundamentally new products. Process innovations mean new methods of industrial management (new technologies). Process innovations can be associated with the creation of new organizational structures within the enterprise (company).

By novelty type for the market, innovations are divided into: new to industry in the world; new to industry in the country; new for this company (group of companies).

If we consider the enterprise (company) as a system, the following types can be identified:

1. Innovations at the entrance to the company (changes in the selection and use of raw materials, supplies, machinery and equipment, information, etc.);

2. Innovations at the outlet of the company (products, services, technology, information, etc.);

3. Innovation of company system structure (managerial, production, technostructure).

Depending on the depth of the changes, the following innovations are distinguished:

- radical (basis);
- improving;
- modification (private).

These types of innovations differ from each other by depth of life-cycle phases.

Foreign experience allows bringing the extended classification of innovation with regard to company areas, where the following innovations are distinguished:

- technological;
- production;
- economic;
- commercial;
- social;
- in management.

Complete classification of innovations was proposed by A. Prigozhyn:

1. By extent:

- singular;

- diffusive.

Diffusion is spread of once mastered innovation in new conditions or to new objects of implementation. Diffusion causes a transition from a single introduction of innovation to innovation within the whole economy.

2. By place in the production cycle:

- raw material;
- providing (connect);
- product.

3. By degree of sequence:

- replacing;
- cancelling;
- revolving;
- opening;
- retro innovations.

4. Be coverage:

- local;
- system-based;
- strategic;

5. By innovation potential and degree of novelty:

- radical;
- combinatorial;
- improving;

Two other areas of classification, taking into account the scale and novelty of innovation, innovation changes intensity, reflect mostly quantitative and qualitative features of innovations. They are important for the economic evaluation of their consequences and reasoning of management decisions.

Innovative manager's functions in the company are fulfilled either by a traditional manager or by a specialist, such as a consulting firm.

Creation of venture companies assumes availability of the following components:

- Innovation idea – new product or technology;

- Social needs and an entrepreneur willing to establish a new company based on the proposed idea;

- Venture capital to finance such firms.

Venture funding is provided in two basic forms - by purchasing of new firms shares or credit extension of different types, usually with a right of conversion into shares.

Venture capital – is investing in not only large companies but also banks, state, insurance, pension and other funds, in areas with a high degree of risk, and in new business.

Unlike other investment forms, this form has a number of specific features, such as:

- Direct or indirect investor's share participation in capital of a company.
- Long-term providing of funds.
- Active role of investor in the management of the firm.

The specific character of risk business is the the funds provided on non-refundable flat basis with no need of coverage usual for crediting. The resources obtained into possession of a venture company are not subject to withdrawal during the entire term of the agreement. Returns on investment and profit application occurs when company's capital issues enter the open market.

Success of risk business in scientific and technical innovations development made separate large industrial enterprises of military industrial establishment (MIE) take internal risk projects or internal ventures. They form a small unit, which is organized for the development and manufacture of new types of science-intensive products and provided with considerable autonomy within large enterprises. Selection and funding of proposals received from employees or independent inventors are conducted by specialized services. If a project is approved, the idea's author takes charge of internal venture. This unit operates with minimal administrative and economic intervention of administration.

During the specified period, internal venture conducts innovation development and prepares new product to launch into extensive manufacturing. Usually, it is unconventional for this company production.

Internal risk project can contribute to the search of new markets. If the project turns out to be successful, a unit can be reorganized for the extensive manufacturing of this product, or transferred to other units.

Scientific and technical developments have priority. However, innovative business - is not pure science or invention.

In the West, an innovative firm is headed by an engineer who is the author of the project technical side, and a manager with organizational and commercial experience. The mechanism of such union is formed through the skeptical attitude of large companies to ventures. Not getting the opportunity to implement innovation in the company, manager gets into a new idea, leaving the former place of work. Then he tries to implement these ideas as an independent entrepreneur.

Explerent firms-s are called "pioneer". They work on the stage of inventive activity cycle and the beginning of product release.

Venture companies and explerent firms have provided conditions for scientific and technological progress in modern economy of the West. Explerent firms and venture companies are small.

Innovative processes require full support, because the main feature of modern

stage of science, economics and production development is innovative orientation. The goal of technological parks is stimulating of small innovation business. Besides technological parks, there are business incubators aiming at the implementation of any project promising a profit. Business incubators cooperate with banks that are willing to invest risk capital in some projects of incubator.

Explerent firm (pioneer) faces the problem of production output when the innovation attractive to the market has already been created. For this, explerents make alliances with large firm. Explerent is unable to replicate its innovation. Delay of replication may cause appearance of copies or analogues. Union with the leading firm (even under conditions of merger and subordination) provides favorable conditions and even saving of some autonomy. The choice of such partner depends on the specific consumer.

Patient firms provide focus on thin market segment. They meet the requirements formed under influence of fashion, advertising and other means. They operate at the stages of product release growth and simultaneously at the stage of inventive activity drop. Requirements for the quality and production volume of these firms related to the problems of entering the markets. There is a need to make decisions to conduct or stop development, on feasibility of the sale and purchase of licenses, etc. These firms are profitable. At the same time, there is a possibility of wrong decision taking, which leads to crisis. In these firms, an innovative manager position providing their activities is advisable.

The main task of innovative manager is to reduce the risk of company's vital activity and create a comfortable working environment for employees.

In the sphere of large standard business, there are violent firms.

Violent firms are firms with strategy of "power". They possess big capital and high level of technology mastering. Violents are engaged in extensive manufacturing of products for wide circle of customers who have "average demand" on quality and are satisfied with the average price level. Violents work in the "outskirts" of maximum product release. Their scientific and technical policy requires decisions on term of products output (including the acquisition of licenses); products taking out of production; investment and expansion of production; replacement of populations of machines and equipment.

As patient firms, violents are profitable. Profitability - an indispensable condition of firms. They must be innovative office manager and be very careful to change their policies. Profitability - an indispensable condition of firms. They should have position of innovative manager and be very careful when changing their policies.

Commutant firms deal with medium-sized enterprises and small business focused on satisfaction of local and national needs.

Commutant firms act at the stage of decrease of product release cycle. Their

scientific and technical policy demands taking decisions on timely products setting in a business environment, degree of technological features of products released by violents, on appropriate changes according to customers' requirements. Innovative manager of such company should be well versed in product customer's specific, market situation, accurately, efficiently and reliably predict the possible crisis. Organization plan of companies' management depends on their activities characteristics.

2.3 Productivity of Innovative Ventures

The procedures of investment projects assessment, legal registration of agreements and contracts, as well as the forms and methods of their execution control act in all countries with developed market economy. Great attention is given to the terms of examinations execution, approvals, and duration of the period from filing of applications and proposals till financing starting or benefits and subsidies providing. Methods of control over project implementation progress and usage of means according to the intended purpose are being improved; the number of mandatory conditions to be met by the project is increasing.

There are three main methods of innovation projects assessment financed from the budged:

- descriptive;
- comparing of conditions "before" and "after";
- comparable examination.

The descriptive method is wide spread in many countries. Its essence is in consideration of potential impact of the implemented projects results on the situation on a certain market of goods and services. It allows taking into account, for example, the interaction of R&D sphere with patent law, tax legislation, staff training and retraining. The descriptive method allows results generalizing, predicting and taking into account the secondary processes.

The main disadvantage of this method is that it cannot properly compare two or more alternatives.

The method of conditions "before" and "after" comparing allows taking into account quantitative as well as qualitative indicators of different projects. However, this method is characterized by high probability of subjective interpretation of information and forecasts.

Comparable examination is the comparison between the situation of enterprises and organizations that receive public funds and the ones that does not receive it. This method is focused on comparison of the potential results of project, which is

implemented and meets the requirements of economic feasibility validation of specific solutions on short-term and fast-payback projects' financing.

The comparable examination method is applied in USA and other countries with developed market economy.

At the same time, this method also has disadvantages; in particular, it cannot be applied in the formation of long-term priorities of state policy.

Advantages and disadvantages of various methods of innovation projects examination determine their combined application.

The special commission of OECD recommend the principles of examinations execution:

1. The presence of an independent researchers group acting as arbitrators in contentious situations on the examination results, on selection of leading specialists and control methods.

2. When calculating the value added, the research and innovation activities are considered as productive.

3. Perform preliminary forecasting and costs planning in the midterm to be able to determine the desired efficiency and control time.

4. Associate control methods with the development prospects of scientific and technological policy management at the state level.

In some countries, such as France, expert evaluation of projects and monitoring of their implementation are held by the organizations engaged in funding. Mandatory parameters are: deadlines for completion of individual stages of work and the entire project and the degree of risk associated with the project implementation. In this regard, in France the terms of large-scale applied research range from 8 till 15 years.

During the projects examination the potential impact of research results or developments on social, economic and ecological environment should be taken into account.

Each expert group may include highly skilled representative of the examination customer.

Experts have rights to demand any information related to the project.

In the countries with developed market economy, the work of experts is not limited by project assessment only; it can predict control over work progress. Thus, control methods should correspond to the level of conducted examinations. Examinations includes not only quantitative but also qualitative assessment of projects. When taking a decision, the estimates expressed by each member of the expert group are taken into account.

Under market economy conditions, the innovative project version is selected with consideration of the investors' interests.

When comparing the versions, the principles of system approach should be

complied. Especially the most important feature of systems should be considered – emergence, which determines inequality of combined effect from the set of measures, and the value of the separate effects from their separate conduction.

When comparing innovative versions, the principle of complex approach is applied, requiring the consideration of all measures to be taken during the implementation of this version of solution.

Equal in value costs invested at different times, are economically uneven.

Long duration of the innovations life cycle leads to economic inequivalence of costs and obtained results. This contradiction is eliminated by the discounting method, that is, the adjustment of the costs and results to the same point in time. As a point of time, you can take, for example, the first year of innovations implementation.

Discounting is based on the fact that any amount to be received in the future, now has less value.

With the help of discount, the factor of time is taken into account in financial calculations.

The discounting idea is that it is more profitable for a firm to receive the money today rather than tomorrow, since being invested in innovation, tomorrow they will bring some extra income. In addition, it is risky to postpone the receiving of money for the future: under adverse circumstances, they will bring less income than expected, or even bring nothing.

Discount factor is always less than one, because otherwise the value of money today would be less than tomorrow.

Consider a hypothetical example. If today you invest in innovation 1 billion of conventional units, hoping to get 10% of revenue, then in a year your investment value will be 1.1 billion of c.u. - this is the future value of your investment, and its present worth is 1.0 billion of c.u.

The difference between the future value and present value is discounts.

Discounts factors are calculated by the compound interest formula:

$$\alpha_t = (1+i)^{t_p - t},$$

where i – interest rate, expressed as a decimal fraction (standard discount);

tp – year of costs and benefits reduction (target year);

t – year, which costs and results being reduced to the target year.

Under the conditions of reduction to the year of the innovation implementation beginning we have tp=0, so

$$\alpha_t = \frac{1}{(1+i)^t}$$

With a positive amount of capital interest rate i, the discount rate is always less than one.

Consider a hypothetical example: determine the current value of 20 billion c.u. to be paid over 4 years. During this period, the initial sum bear compounded interest rate at 8% per annum.

Hence the present value will be: $20*(1+0,08)^{-4} = 20*0,7350 = 14,7$.

The interest rate of discounting and the current value are inversely related, that is, the higher the interest rate is, and the lower the present value is all other things being equal.

Thus, annuity method of depreciation is that at the first charging period conducted on initial credit amount, then it is summed with accrued charges and in each subsequent period, the interests are accrued to accreted amount. In other words, the basis of interests calculating is constantly changing. Sometimes this method is called interest on interest.

The lower interest rate is and less the period is (t), the higher the discounted value of income receivable is.

Thus, by discounting the net present value of the project (NPV - net present value) is determined.

Innovative projects should be selected considering the inflation factor.

Inflation as the price level increase in the economy is measured either by a price change index or inflation level. The price change index is characterized by the prices ratio and the inflation level - the percentage of price increase.

Considering the role of interest rates when decision taking on innovation, we assume no inflation. If there is inflation, there are differences between the nominal and actual interest rates.

Nominal rate is a going market rate without consideration of inflation rate or in other words, it is just the interest rate, denominated in roubles (USD) at the current rate of exchange.

Actual rate is the nominal rate minus expected (anticipated) inflation rates.

For example, the nominal annual interest rate is 9%, the expected inflation rate is 5% per year, hence the real interest rate is equal to 4% (9 - 5).

This distinction is important to consider when comparing the expected earning level on capital (rates of return) and interest rates: it is appropriate to conduct the comparison with actual rather than nominal rates. That is the actual interest rate, not the nominal rate is important when decision taking on innovations.

The general rule is that innovations should be implemented if the expected earning level on capital is lower or equal to the market rate of interest on loans.

Thus, the percentage performs the critical task of resources efficient allocation in

market economy, selection of the most profitable of possible innovative solutions.

Comparison of the level of returns to capital with interest rate - is one way to prove the effectiveness of innovation.

Besides net present income for the selection of innovative projects, the following indicators are used: payback time; payback period; internal rate of return (IRR); profitability (PI).

Payback period - an indicator characterizing the term during which the investments in the innovative projects can be paid off. This indicator takes into account the initial capital investment.

In international practice, mainly the payback period is used – the period during which the sum of net income, discounted at the time of investment completion, equals to the investment amount.

Internal Rate of Return - calculated interest rate at which capitalization of income received regularly gives an amount equal to investment. This means that investments pay off.

It is recommended to select the projects with internal rate of return not lower than 15-20%.

In practice of innovative projects' evaluation, the benefit – investment costs ratio is calculated. In Western literature, this indicator is called the profitability index.

Common to all indicators of innovation project efficiency is the calculation of the effectiveness ratio by the following formulas:

$$Er = \frac{E}{C} \quad \text{(direct index)},$$

$$Er = \frac{C}{E} \quad \text{(reverse index)}$$

where E - effect (results) of project implementation;

C – costs connected to the project implementation.

The cost minimum of projects' implementation can be the criterion of projects selection.

When selecting innovation projects, should pay attention to the ways of risk reduction.

If there are several versions, the most effective is selected by a minimum of so-called reduced costs:

$$Ri = Ci + EsIi = min$$

where Ri – reduced costs for each variant;

Ci – production expenditures (cost value) for the same variant;

Es - standard of investments efficiency;

Ii – investment for the same variant.

Since investments are characterized by single or limited period of investments and long payback period, while the production expenditures is usually an annual value, in order to adjust to a single annual dimension using the cost-to-performance ratio or the interest rates level, part of the investment (capital contributions) is taken. That is how the term “reduced costs” appeared. The value, which is reversed to the payback time, is the effectiveness ratio of complementary innovation investments or comparative effectiveness ratio - Er.

This indicator is calculated by the following formula:

$$Er = \frac{\Delta C}{\Delta I}$$

Calculated value of the effectiveness ratio Er is compared with standard value Es, respectively satisfying investors with earnings rate on capital. If Er> Es, there is a need of more investment in innovation, thus more investment intensive version.

Thus, to select the versions of innovative measures the comparative market effectiveness ratios are used, which take into account only the changes of values.

These indicators are:

- Reduced costs;
- Payback time of complementary innovations;
- Efficiency ratio of complementary investments in innovation.
- The effectiveness ratio of complementary innovation investments.

Section 3

HR MANAGEMENT OF INNOVATIVE ENTERPRISES

3.1 Human Resources Management System of Innovative Enterprises

Personnel are the most significant functional subsystem of the enterprise and they represent the most valuable resource of innovative development. Having particular strategic and effective functions, the human factor plays the main part in intellectualization and informatization of the production. The management level of scientific personnel, efficiency and motivational behavior of employees determines success of innovative activity and its efficiency.

Innovation enterprise (IE) personnel are, first of all, active participants of development and assimilation of up-to-date technics process, i.e. it is a socio-professional group consisting of research, engineering and technical, and other classes of workers accomplishing the process «investigation – production – consumption». They are connected with the single final aim, common traits in matter, character and labor conditions, as well as incentive scheme.

The complexity of the personnel structure is the result of particularities of innovative goals, and also the specific character of scientific and scientific-technical labor. The components of this structure are research workers, engineering and technical workers, management personnel, workers of pilot production, support and service personnel. The functional division of labor in IE as well as in any other organization is performed with workers' division according to occupation, specialties, professional skills and posts.

HR Management in innovative enterprises (including scientific subdivisions of enterprises and corporations) is the implementation of the function of personnel planning, selection and displacement of workers, forming the optimum (rational) relationship structure among personnel, regulation of the motivational behavior of employees, creating of favorable, moral and psychological climate in a group, settlement of conflict situations, organization and motivation of labor. Functions and methods of HR Management in innovative enterprises mostly depend on peculiar

traits and contents of innovative work. These traits are uniqueness and singularity of executable labor, high professional skills and learning of employees, insufficiency of innovative process infoware (especially at first stages), the risk of functioning of many organizations (for example the venture ones), the variety of social groups consisting of experts performing innovative work.

The most important feature of IE personnel is their qualifying composition. Qualifying features fulfill three functions: serve as the ground for compilation of operating instructions according to posts, are criteria while rating of employees for posts replacement and is the basis for fixing of a salary.

At the present stage the innovative processes development there is the obvious necessity of combining workers' efforts of different professional skills and specialties, tendencies and abilities to solve the questions that arise during investigation. The part of collective labor grows permanently with the increase of scales and complexity of innovative work. It is necessary to form a group, determine conditions of its optimal operating and develop the leadership style to make the organization work coordinated and HR Management effective. Permanent intercourse of workers of different occupations and specialties, who are summoned for complex innovative work solving, assures their professional skills growth as well as specific interchangeability that increases work efficiency in the group and, to a certain extent, speed up its performance.

The personnel of innovative enterprises are formed on the basis of observance of several principles. They include: complexity, psychological, moral and intellectual compatibility, size optimality and personnel structure, and also dynamism of its membership. Besides, the following principles are also referred to the previous ones: conformity of official hierarchy to the factual standard of employees' authority. For the normal personnel operating each member has to have a field in which his or her competence level is considered to be the highest. The group forming includes the personnel planning, the personnel selection and distribution, their displacement, creating of the moral and psychological climate etc. The personnel selection and distribution are performed in three cases: while creating a new innovation enterprise; while forming a new structural subdivision composed of an organization; while traditionally improving of operating subdivisions and organizations on the whole.

Irrespective of kind and stage of the innovative work their success is determined, first of all, with the research personnel professional skill level. The professional skill level appropriate to this organization is achieved with observance of the complexity principle. In compliance with the complexity principle the personnel is formed from different specialists: research workers, theorists, experimentalists, design engineers – young and experienced. At the same time it is essential to select those who are the most capable to offer ideas and work in new directions without petty tutorage, with

initiative and intellectual curiosity, appropriate education, intellectual facilities higher than average, professionals in their field of knowledge with the ability to use their skills.

When an employee is appointed to a post, first of all, it is necessary to determine the level of his or her activity for effective performance of innovative project tasks as well as for creating and conservation of a salubrious and pleasant climate in a group. While the group forming the ratio of the research workers number and the auxiliary personnel number which is determined with scales of theoretical and experimental works, the uniqueness of serving instruments and test sets should be fixed at any management level.

While innovative enterprises personnel forming the personnel selection of other category is more complicated. Here for developments it is expedient to involve the most qualified workers who understand the importance of specific innovative project goals. To implement such goals it is expedient to choose those specialists who are more experienced.

Measures to enhance the work with personnel assume three directions: work quality improvement of scientific personnel as well as, if it is possible, engineers introducing results of their innovative work. This upgrades profession skill and expand horizons; the development of specific interdisciplinary researches and workings; the development of employees' management capabilities for the preparation of being appointed to higher posts. Selection, distribution and progress of personnel are the complicated and creative process. It is performed with involving of scientists, educators, psychologists and the application of different methods of the professional skills assessment, approaches, matrices and testes, and also attestation forms. Sometimes formalized methods are used.

The significant part of HRM (Human Resources management) is the formation of rational relationship structure and creation of favorable moral and psychological conditions in personnel, which creates conditions for effectiveness increase of innovative labor. The creation of favorable moral and psychological conditions depends on three components, which in common interdependently assist this process: this is the list of psychological principles of labor rationalization of researcher and design engineers; social and psychological principles of formation and running of the personnel; executive role and leadership style.

At personnel management, particularly at the process of staff selecting, it takes into account the principles of creative psychology work, which are important for efficient organization of scientific-technical institutions. In Personnel Management System development social and psychological principles of personnel forming deserve attention. It is the second component of moral and psychological conditions in the personnel. When clear up them it is necessary to keep in touch the following:

the research personnel are a frame of society, in which collaborative engagement is performed. But its relationship and collective labor are necessary to organize in the way that the individual needs of every employee could be satisfied through participation in the collective labor to a greater extent than outside the group. Otherwise it takes place informal social interactions between the employees, which influence the activities of formal organization.

In the collective of innovative enterprises labor organization is realized in accordance with subject-matter, object-one and operating procedure in the context of group interaction in the process of implementation of innovative projects, there is a specialization in the functions performed in the course of cooperative labor. These functions, i.e. the character of current tasks solved by employees, determine their social and scientific role: producer, erudite, reviewer, performer, specialist, organizer, and orientator. At the different stages of research various social and science roles are determinative. Its differentiation provides better opportunities for implementing personal creative motives of employees.

Analyzing the role playing structure of the personnel, the leader can make defined modifications, promoting favorable conditions for successful activities, and in the long run for effective Human Resources Management. The leader plays an enormous part in creating moral and psychological conditions in the personnel. The duty of the researchers and design engineers is to build bridges amid innovative favors and staff orientation and economic and financial orientation of top management. Moreover, he has to get this in the environment when it`s necessary to maintain the atmosphere of artistic freedom for a great number of researchers and development contractors and simultaneously to fulfill a requirement in relation to efficiency and profitability of innovations.

Human Resources Management in innovative organization has a set of features: highly skilled labor orientation; particular requirements for psychological characteristic of the employees; rapid staff turnover including scientists and experts; defined selective system of employees; availability of creativity and the achievement of the jobseeker; the possibility to realize the high level needs.

The significant distinction of innovative staff management approaches from traditional ones consists first of all in staff selecting. Traditional approach means that the essential volume of work to set is determined considerably by the difference between the available manpower and the expected demand. In the innovative activity which is characterized by uncertainty and significant risk it is almost impossible to predict the workforce demand. Besides, the work in innovative organization lays supplementary claims to the potential employee. In addition to the traditional qualities (theory, experience, diligence, health, etc.), he/she should have flexible and movable mentality, imagination, needs for creative self-realization, the ability to

adapt to rapidly changing operating conditions, inclination and ability for training and retraining. HR manager, who works in innovative organization, has to test creative abilities and achievements of jobseekers. Apart from typical labor potential estimation procedures such as manager resorts to qualitative assessment, which includes the list of creative personal qualities, his/her publications and patents. So far as given information refers rather to the past achievements of the jobseeker it is impossible definitely to judge his/her compliance with the future requirements. During the staff selecting process HR management department of innovative organization has to resort apart from traditional methods to test collections, psychological tests and creativity competitions. To do this, the HR manager ought to develop criteria of creative success and put into practice estimation procedure of significant features for this innovative sphere.

Work in the innovative organization has a highly skilled labor orientation, which is based on innovator-specialist personality and innovator-manager one which in its turn affects the performance of HR management department. The main figure of innovative activity is an intellectual inclined to creativity and innovating. Consequently, HR managers should pay greater attention to the content and inner motivation, the problem of choice of optimal mode of operation.

In innovative organizations the daunting problem of continuous professional development necessity of innovators and the development of their imagination is on the forefront. Innovative activity requires from employee deep and state-of-the-art-knowledge as well as creative strategy. Lately trainings which reveal creative inner potential of specialist-innovator, his/her initiative, leadership, responsibility, managerial abilities, skills to make timely and exact solutions.

Innovative companies develop creative potential: the rotation of staff between diverse functions business units or territorial subdivisions; detailed, intelligent management of personnel advancement; the introduction of common practice which would make available defined key practical skills and key opportunities of all personnel; the administrating of personnel turnover before accepting for employment.

3.2 Selection and Adaptation of Innovatively Active Personnel

The search process of innovatively active personnel is an actual problem for the major of up-to-day enterprises. Competent and qualitative personnel recruiting response is able to increase the work efficiency of the company in many times , besides the staff selecting should be grounded on the permanent improvement of

personnel development and on the use of innovative achievements of foreign and national sciences, as well as on the best field experience.

Detailed approach to staff selecting guarantees the quality of workforce which in the large extent defines the efficiency and the opportunity of future use. Although exactly management innovations foster the implementation and distribution of achievements of scientific and technological advance, quite recently one of the main indicators of innovative development of organization considered to be the quantity of technical improvement, inventions and their efficiency, however innovations were not considered in management activity.

The establishment of essential links between such natural personal features as reasonableness and innovation, as the intellect is the creativity of new knowledge, from the dialectic materialism point of view and reasonableness is the intellectual quality to use new knowledge, showing real actions.

In this case a person is subjected to the permanent adaptation to once-a-minute changing reality, that is why innovations are not only justified, they are indispensable as well.

Personnel Management perception level to the new, to the achievements of scientific and technological advance largely depends on social and psychological conditions in the organization, which in general should favor initiative search of innovations, independent preparation of production tasks broad spectrum by employees and strategy selection of its achieve.

The level of speed conversion from traditional to innovative management strategies, which will the most accurately qualify modern scientific and technological advance, depends exactly from the readiness to the changes of the leader in the organization.

In this case significant changes in functions of the personnel department leader will also take place. They will include such a discipline like development consulting of new approaches to personnel policy, oriented to the future.

The foreground task of the personnel department leader consists in the following: planning of the personnel arrangements, training and various staff professional development, staff selecting and its adaptation, system and principles of labor remuneration organization, consulting of the unit managers regarding HRM.

Innovation policy in the HRM creates favorable working conditions, and provides opportunities for advancement and the necessary confidence level in tomorrow.

Innovation personnel management grounds on the next initial positions:

–the necessity of tight fit between development strategy of the company and personnel planning;

–degree evaluation of the by-product management influence on the manufacturing economic indicator;

–the development of required quantity of the competences, professional skills for efficient work on the labor-market.

In the area of personnel employment there are also innovation developments, especially new control methods. They include such new groups like humanization method, method of emotionally- aesthetic backdrop and classical approaches of occupational selection (interlocutions, contests, interviews).

The priority direction of above-mentioned area is the leader`s ability to create conditions for the potentiality realization of each employee, manifestation of active interest to the work, aspiration to solve set tasks in optimal mode. The organization success largely depends on the manager`s ability to interact with colleagues, on his professional and personal skills, and his/her ability to lead the staff properly.

The process of mutual accommodation or labor adaptation amid the employee and the organization will be the more successful, the more collective principles and values are or will become the ones of individual employee, the more quickly and better he/she accepts, adopts his/her social role in the collective.

The success of adaptation depends on the variety of reasons, the main of which are: qualitative level of work on the professional orientation of the jobseeker; objectivity of personal appraisal (as in the selection, so in the process of labor adaptation of the employees); the work of organizational adaptation control mechanism; prestige and attractiveness of the profession of unique specialization in the certain organization; peculiarities of labor management, which realize the employee`s motivational aims; an availability of bug-free system of innovations implementation; the flexibility of personnel teaching system, which is used inside the organization; peculiarities of social-psychological conditions in the personnel; personality of adaptable employee, which are connected with his/her psychological features, age, marital status, etc.

The adaptation process of innovative-active personnel can be divided into several stages.

Stage 1: Appraisal of the candidate`s level of training, which is necessary for the development of the most effective adaptation program, in particular, professional one. The result of such appraisal can be the forecast of candidate`s adaptation success and the determination of his/her modes of study.

Stage 2: Acquainted phase, which includes the receiving of the organization information, working conditions and content, standards of behavior, etc.

In foreign practice this stage is called orientation and all adaptation activities are expected to be called orientational.

Orientation includes two components – information about the organization in general (common orientation), and the information about the subdivision and the working place (specific orientation).

Stage 3. Adaptation phase.

Stage 4 represents the workers assimilation stage – the process of their absolute adaptation to the working environment. This stage almost finishes the adaptation process. It is characterized with permanent problems overcoming and transition to the stable work.

Stage 5 of the adaptation is characterized as the identification of worker's personal goals with group goals. The identification process shows itself in several varieties:

–emotional, it is characterized with common feelings and experience.

–value and world outlook – common values, views, points of view.

–behavioral – common actions, acts.

The adaptation management is the active influence on factors predetermining its process, terms, negative consequences.

The adaptation management assumes:

–structural fixing of adaptation management functions;

–adaptation program development.

There are two groups of indicators to estimate the work success of the innovation-active personnel adaptation:

–objective indicators – level and stability of qualitative labor indicators: standards performance, executable work quality, professional skill development, labor discipline level, new personnel turnover etc.

–subjective indicators – satisfaction level of new personnel with their occupation, conditions, wages, remuneration of labor, personnel relationships etc.

The innovative character of up-to-date companies' activity modifies requirements to a worker, largely increasing the significance of creativity in work and high professional qualities. This tendency has already led to considerable modifications in methods, principles, and also socio-psychological problems of personnel management.

One of the priority directions of HR Management innovative infrastructure forming have to become innovative centers forming, off-budget and budget organizations preparing specialists occupying with HR Management questions that will be the foundation, "intelligent heart", of knowledge-intensive innovative enterprises and contribute to the transmission of more qualitative and competitive scientific-technical production to a market. At the same time present-day personnel management have to create preconditions for solving actual personnel problems. There is workers professional training enhancement, activation of interaction between company subdivisions, the increase of different company links significance in industrial tasks solving among its opportunities.

Innovative transformation of personnel management, first of all, is directed to the

motivation policy realization oriented to the expansion of effective interaction of personnel and leaders. It stimulates workers to the development of their potential and to the active, productive and creative work.

Occurring transformations demand timely revealing of possible innovative problem situations in combination with HR Management problems. The following contradictions are among problems occurring in this connection:

–between scientific and technical level of new production and existing personnel professional skill level;

–between the ability of training, retraining and advanced training educational institutions and required personnel professional skill;

–between qualitatively new tasks of workers development and insufficient training level of HR Management service to this work;

–between motivation level and workers professional skill;

–between elite personnel and company personnel basic mass;

–between existing organizational structure and implementable personnel strategy and others.

The permission of above mentioned discrepancies will create favorable conditions for permanent and effective renewals of HR Management systems that will be capable to consider complexity of external competitive environment, forecast and implement appearing possibilities of effective use of innovative potential of company personnel, and also improve the work with employees on each stage of company life cycle.

3.3 Estimation and Motivation of Innovatively Active Personnel

Personnel motivation and acceptance of proper decisions are necessary to achieve innovative enterprises goals in view of varying conditions. Planning, analysis and control create only the basis for human activity realization. And success depends on people in the innovative field more, than in any other one. In particular, appropriate assessment system of innovative activity contributes to the efficient system forming of its stimulation. The reasonable and declared system of innovation-active personnel indicators is not only the important information source for intellectual and creative HR Management, because allows determining innovative potential and its utilization level, but the company competitiveness providing mechanism, as it is management decision acceptance basis regarding personnel stimulation and development.

It is expedient to fulfill personnel innovative activity assessment at each separate

stage of the innovative activity: planning, fulfillment, control, improvement, final realization. It has to be carried on taking into account established levels of personnel activity efficiency: minimum level – efficient fulfillment of established goals and duties with the possibility of sanctions that are applied by a leader for its improper performance; maximum level – depends on the level and extent of personnel use of their creative potential. While forming of the innovative activity indicators system and immediate estimating process realization the assessment assures more accurate planning, work quality control, motivational mechanism improvement.

Personnel innovative activity indicators system that is widespread consists of three groups where each combines quantitative and qualitative indicators: personnel innovative activity effectiveness indicators (rationality coefficient of work methods; coefficient of worker's innovative activity; coefficient of worker's contribution to enterprise innovative activity results); coefficients of personnel professional skill level (coefficient of worker professional skill use level; coefficient of worker professional skill development); indicators of personnel personal qualities (indicator of worker capability for studying; indicator of worker's initiative; coefficient of labor discipline; coefficient of responsibility; indicator of socio-psychological worker adaptation).

A personnel innovative activity method is worthy of notice. The base of this method is estimating of four innovative activity factors: intellectual resources (the presence of research departments and subdivisions at an enterprise; dynamics and the quantity of licenses and patents; financial resources provision; knowledge and information provision; technological and technical equipment assessment), innovative receptivity (positive or negative reception of innovations by organization employees; positive or negative information reception by workers; internal innovations readiness; employees improvement), organizational and management resources (organizational structure assessment; assessment of the interconnection presence between subdivisions with innovative ideas progression at the enterprise; assessment of management system development level; assessment of encouragement system and creative potential motivation) and socio-psychological climate (calculation of indicators concerning assessment of corporate organization components, in particular: team spirit, common norms and behavior values; participation in acceptance of management decisions; support of useful undertakings; respect from the direction of leadership; responsible approach to the work). There are two possible variants when indicators of each group are measured: 1) adaptation of developed method to specific enterprise peculiarities – ten-point scale is developed for each indicator where quantitative indicators are determined for accurate estimation; 2) personnel innovative activity express-estimation with minimal time and work costs – there are only two possible value for each indicator – "0" if the

estimation is negative and “1” if the estimation is positive.

Resources provision indicators system of innovative enterprise activity is also used to estimate personnel innovative activity as the component of innovative enterprise activity: intellectual component (indicator of inventive and labor-saving activity; quantity and part of workers who have patented inventions, author's certificates and other supported rights on intellectual property; the part of rationalizers and inventors in common workers collective; educational level indicator); personnel component (the quantity and the part of enterprise workers with higher education, with an academic degree; the quantity of specialists in the field of innovative management who work at an enterprise at the moment and their part in the total number of personnel; the personnel number with profile education and their part in the total number of personnel; indicator of employee turnover with higher education); research component (the part of costs on R&D in total volume of goods production; the part of costs on using scientific and technological attainments in volume of goods production; the ratio of costs on R&D (research and development) and costs on introduction new technics and so on; the quantity of received titles of protection); technological component (the presence technological innovations; coefficient of technologies updating; the part of outdated kinds of production in total cost of production made by an enterprise; the part of innovative production in total cost of made production).

Personnel attestation at IEs is one of the main ways of estimating professional qualities of workers. Under attestation is understood collective complex estimation of professional and moral worker’s qualities. When workers are estimated such criteria are considered: effectiveness and their labor quality, personal contribution to advancement of science and engineering etc.; applications, patents, publications, complexity and timeliness of executable researches and workings; conclusions about conformity of a worker with his or her post.

While realizing attestation there are basic criteria such as worker’s professional skill and results received while he or she were fulfilling the duties. It is expedient to appraise of workers’ labor effectiveness quality using integrated indicator – labor effectiveness coefficient (LEC) to determine objectively the contribution of each employee in solving goals of goals and distribute labor remuneration fund between employees. Moreover, analysis of such estimations can be extremely useful while preparing a worker’s description for his or her attestation. LEC represents an integrated estimation in points of the complex of particular labor effectiveness indicators. Labor effectiveness integrated indicator of each employee on the basis of particular indicators estimations is calculated as the product of simple worker’s labor effectiveness indicator and simple indicator significance in the general estimation system.

Control system can show the direction of efforts, but enthusiasm, energy, which will be used to accomplish the movement in this direction largely, depends on the causes, which involved in work scientists and engineers follow. Motivation is a personal urge to act in a specific and purposeful mode. This is an internal state, which identifies human behavior. The accountancy of motivations is of great importance in the scientific personnel management. Internal and external motivations of activity are distinguished there. Internal motivation is determined with the content of oppositions and difficulties, which are inherent in current tasks, intrinsic logic of advancement of science, which reveals in research`s intentions. External motivation comes from the other forms of its value system. These forms can be important for the person, but remain external in relation to work-in-progress, to its results.

The significant external motives of research work, innovations are to win one's spurs in the scientific community, to assert priority of invention, to achieve the high level of competency, to perform innovative in line with instructions, in fixed times, tendency to exclude the mistakes.

Employees` motivational behavior underlies in the theory of human wants of A. Maslow. According to this theory, material benefits and money satisfy primary, physiological needs. But money energizes only 30–50 % of employees. The main part of employees is energized with more high needs: in knowledge, creativity, authority, recognition, the achievement of great goals, high ideals, etc. These factors are often of great importance for scientists, design engineers, scholars.

In motivational aims of domestic innovatively active employees, scholars` motivational behavior takes place a turning point and material forces of motivation and material needs come to the fore. This situation, explained by low level of scientific and engineering personnel remuneration and transition to market relations, can`t but affect the forms and methods of personnel management. In personnel management it is necessary to take into account that employees concerning types of motivation are divided into several groups, which amend control system and take into account peculiarities of content and process theories of motivation. The alteration of motivational aims of innovatively active personnel, when material needs come to the fore to the prejudice of professional ones, requires the development of diverse forms and systems of remuneration, official movements and promotion tracks.

Nowadays, material encouragement is piece and time wages for employees of innovative organization of varieties. It is also used a contracting remuneration of labor, payroll management with proper bonuses - additional payments and bonus awards.

Along with material encouragement moral stimuli take an important place. Discrete role of moral stimuli of innovative personnel work is connected with its creative nature, which makes working process attractive. There are a lot of specific of

moral and creative stimulations of scientific units employees: flexible working hours, an opportunity to work with own ideas routinely, if they correspond to company specialization. Employees, who develop their own or advance ideas, are characterized with more intense internal motivation and high efficiency of labor.

The broadening of initiative labor like one of the moral stimuli favors rational and healthy training of creative needs. The development of independence in terms of the broadening of innovative projects is important for long-service employees with many-sided activity profile, who achieved defined success and authority. It is necessary, without fail, to maintain creative stimulus for the certain group of employees, by including in the plan suggested themes (projects). Such approach has nothing in common with social and psychological innovative concepts, which are based on the marginal man theory. According to this theory a certain group of people is distinguished as exceptional bearer of innovations and their activity is considered as mental aberration, the deviation from standard process of innovative execution phase.

Diverse collaboration between the leader and scientific personnel, the ability to organize communication process with people and take into account their moral qualities, inclinations and interests, behavior motives, objective approach to the conflict resolutions, informal relationship within reasons – are the bases of efficient scientific personnel management in innovative organizations.

Global leaders in the full size of R&D expenditure (USA, Japan, Germany, England and France), which form technological main body of world development, fulfil group of actions on the formation of the personnel preparation center for innovative activity realization in a particular field of activity; give tax remissions, which assist the inflow of direct investments in innovation sectors; accommodate system development of intellectual property protection; encourage clustering; are fully engaged in the formation of public and private partnership (P3) purposely to encourage innovations, and personnel training in innovative sphere.

Stimulation to the innovative activity through the network of innovative children clubs has been occurred in Japan from childhood. In Sweden considerable contribution is done to the formation of openness to innovations during the educational process, where there is a possibility to develop individual abilities of the pupils and students to assimilate and further use of knowledge and skills. In the European Community (EC) the role-defining category of education in process of economy and society formation is recognized. It is confirmed with modernization measures of universities and creation of European Institute of Technology, which tasks are the development of optimal innovative model for EC based on education, research and innovations integration. In the USA, Japan and Germany it is observed a significant education integrate process in corporate sector i.e. their interconnection,

which forms entire institutional structure, which works on equal problems: universities with the help of their researches warm corporations of potential problems, and beforehand train personnel, which can solve these problems; top companies create special innovative departments, which examine correlation questions of possibilities of initial manufacture with needs of final consumer, involvement of high-skilled scientific personnel.

Such measures realize the activating stimulation of personnel innovative activity in global practice: bonus accumulation for development, adoption and production of product innovations, the size of which links with sales gain of such products, its unit weight in the total production volume; in the system of stimulation direct payments, side payments, bonuses, and pension payments are distinct distinguished. The encouragement of innovation implementation is revealed in instructive and professional development, involvement of employees in production control in terms of quality circles; involvement of remuneration consultants, who develop specific criteria, remunerating formulas, rate of remunerations, basing on the appropriate scale of examining estimation of new ideas in terms of efficiency, novelty, expenditure of innovators` work. Accordingly, it is reasonable for increase of personnel innovative activity to use the association of efficient microstimulation with guaranteed prospects of promotion with salary increase, which should take into account such factors: attitude to work, abilities, level of proficiency, job title, the ability to collaborate with colleagues, the level of activity, the number of introduced innovative ideas, etc.

3.4 Training and Innovative Personnel Development

New economics, based on the principles of permanent and accelerated innovative development, needs an adequate level of personnel cadre. Conventional personnel management, which includes corporate personnel training focused on the enhancement of day-to-day operations, for fastest growing business it doesn`t do. High rates of business technological development demand priority development of managers and specialists professional capacity. It is necessary to develop innovative professionalism management, orientated to personnel availability engineering to work with those tasks and terms, which just arise and now are unobvious, but exactly the efficiency of their solutions will define in the near future business success. The arrears in trainings inevitably lead to market power losses and deterioration of the competitiveness.

That is why for the modernization implementation and effectiveness increase of

innovative enterprises use, the system of permanent and accelerated further trainings of managers and specialists, which runs on the basis of forward reference of their training needs in accordance with contemporary trends is needed.

To ensure the personnel competence correspondence to tasks content of innovative enterprises we suggest corporative system of personnel innovative development which consists of:

1) Formative education, which provides the efficiency of company day-to-day operations; it includes appraisal analysis of personnel competence, which is necessary to solve current and new tasks, and of course requirements of its growth;

2) Developmental education, directed at the enhancement of management personnel readiness to successful solving of tomorrow new tasks; it is based on the needs anticipation mechanism, which allows to forecast perspective tasks and to model the activity of the nearest future.

The organization of formative education is based on the accountancy of objective personnel needs in capacity building. In education a specifically developed competence-based manager model is used to appraise professionalism, define specific needs, it is capable to solve up-to-day development jobs of innovative enterprises in the form of professional competences matrix. The matrix is a structured collection of personal competences. For its development it is used an approach under which the competence is employee`s practical ability to solve specific tasks based on systematized knowledge, reflected skills and personal qualities, which are necessary to find a solution.

The structure and the content of the managers and specialists competence matrix can be design in terms of well-known approach, in concordance with which three-tier model is used: competence clusters – specific competence – competence indicators. Different competence clusters, which include complex of knowledge, skills, personal qualities, that promote the solution are demanded to solve each professional task.

Received competence matrix consists of clusters, which include specific competences of three varieties: objective (or objective and trade), management and innovative. Object competences provide orientation and the ability to operate skillfully in specific production technologies and current activities. Its variations correspond to professions that exist in the industry. Management competences provide practical abilities to organize the industry, to run particular business-process and the whole business. Innovative competences are necessary for enhancement and implementation of new industrial and management technologies as well as for creation of new organizational systems. Both management and innovative competences are relatively all-purpose, because of the necessity in every trade and in different kinds of activity.

In general, the species composition of the manager competence clusters depends

on the complexity of current tasks, most of which in modern industry primarily require innovative ones. However, as the results of researches show, the role of innovative competences has more weight in the work of managers.

Separate competence consists of 4-6 specific competences, where each has from 3 to 5 indicators, which are the basic principles of qualification. Therefore competences are assessed with the help of indicators, to measure which were created special techniques that allow assessing them on a 10-point scale.

Competence assessments that reflect the employees` skill level in the company day-to-day activity are present as profiles of managers` professional readiness for problem solving of innovative companies. Analysis of such profiles is used to define employees` needs in further training and accordingly content preparation of their teaching. Themes, questions, class assignments of teaching programs, which are necessary for specific managers and specialists, are developed on the basis of profiles analysis.

The preparation of formative education is realized in two steps. On the first one are managers, whose scores indicate that they, more than others, need to develop their professional competencies. Then their received grades are transformed into specific training programs. To do this, the two-level assessment analysis of professional competence is used. Firstly, it is held on the cluster level – overall profile, and then on the level of competence within a cluster – local profile of a specific cluster. Local clusters are usually formed with clusters, which have low assessments. The structure of the training program is defined on the base of overall profile, and the main themes of the planned training – on the base of local ones.

The main part of the teaching program, intended for in-depth theoretical and practical study will include questions, related to the following specific competences of the second cluster: “to appraise an economic feasibility”, “to correlate resistance characteristics with their financial viability assessments for business development jobs”.

For managers with the original profiles of professional competence, which have no resemblance with the profiles of other employees, individual training programs are developed. Their contents are also design on the base of two-level assessment analysis of professional competence. The individual training in the form of special training and production tasks is realized. Its results are presented to the trainees in the form of reports with electronic presentation at the corporate seminar. If the report receives an affirmative participants` assessment, it will be placed in the actual knowledge base within the intracorporate network. If it doesn`t receive such assessment, it will be improved until eventually it appears in the corporate knowledge base. As a rule, the report of a trainee is limited to one or two views of the report.

Developing education is based on designing of training to business altering. In

companies dealing with quickly progressing businesses the most professional workers are not those who are advanced in tasks of current activity, but those who adapt quickly to new permanently coming tasks. A speed and a quality of mastering new tasks and competences allowing altering their behavior and quickly adapting to new activity tasks and conditions becomes the main thing for a manager.

The subsystem of developing education includes: 1) the anticipation mechanism of new business tasks and correspondingly needs in innovative management personnel education; 2) the method of intensive build-up of individual and corporate knowledge. The anticipation mechanism of new tasks is based on innovations monitoring in science of a certain field and business, and also corporate business games. Monitoring is realized in a traditional way – by means of following innovations using accessible information sources. In the course of innovations monitoring perspective fields of development and appropriate principal themes of business games are determined. In the process of games they are concretized in the formulation of the most probable tasks of the nearest perspective of business development. Thus the direction and business success in many respects depend on business games effectiveness.

It is well known a business game is a form and a way of people interaction organization that imitates practical situations and real activity conditions for forming group decisions concerning organizational, economical, technical and other questions, and also plans preparation and their implementation. In the considering system of innovative personnel development all potential possibilities and business games functions are used. The main goal of games realization is modeling of perspective tasks of near future and appropriate personnel needs in the education that is necessary for the increase of readiness to their decision. But simultaneously with solving of this task a whole series of other important functions are realized in business games:

– forming the equal (single) understanding of strategical company tasks and plans of their realization;

– positions approaching of leaders of different levels in the approach of single projects realization and current activity tasks;

– development and acceptance of effective decisions connected with situational questions influencing dynamics and company business success;

– increase of mutual understanding and coordination between leaders and employees of different subdivisions in solving of present and new tasks;

– development of professional personnel competences and increasing of motivation to the innovative activity;

– development of organizational culture and its separate subcultures

corresponding to company goals.

The game is organized as a command competition of the most successful theme development and professional tasks solving. Teams are formed from managers and specialists of a company taking into account that every team has to have approximately the same number of experienced and young specialists.

The content of tasks that are offered to the teams corresponds to actual questions of innovative company activity and is connected with the most crucial aspects of market competition. Each team chooses a theme of the project, implements its collective studying and creates an effective presentation of own creative work results in the fixed time. The main goal of each team consists in project elaboration including perspective development of the chosen theme.

The game has two stages: 1) theme elaboration and defining of perspective tasks; 2) designing of knowledge structure and competences essential for solving of these tasks. As a result of the game the list of actual company tasks of the nearest perspective is formed. Variants of solving and competences composition necessary for it are determined. The most efficient is the final stage of the game, when ideas and solutions introduced in different aspects are integrated.

The game process in essence turns out to be the beginning of developing education. Assigned and concretized game tasks and obtained solutions create the base and stimulate to professional development of employees. However the main training to perspective tasks solving is realized using specially developed methods of intensive build-up of corporate knowledge. They represent the procedure of systematic new knowledge acquiring and intensification of its exchange, and also in a practical way by employees within a company. The idea of command relay-race organization of main subdivisions responsibility for company personnel professionalism lays in the basis of the methods and is implemented in the form of regular interactive seminar.

Every seminar prepares the collective of a subdivision choosing themes formulated on the base of the analysis of perspective tasks that were defined in the business game. Themes, as a rule, are chosen according to the criterion concerning the content proximity of an industrial activity subdivision. While preparing a training seminar employees gather the newest information connected with theme questions, systematize their experience, generate new ideas, design a plan and a scenario of interactive group work orienting on not only own interests, but other's divisions. In this work they are assisted by advisors and leaders of a company. All managers and leading company specialists take part in every seminar. An information-methodical bulletin is created after interactive seminar holding and is placed within an intracorporate network.

Thereby the present methods assure diversified effect:

– most of employees are involved in search and analytical work, thanks to what innovative activity is increased;

– advanced experience is systematized with collective efforts that stimulates methods enhancement of subdivisions work;

– advanced experience is discussed and enlarged within a company that increase the capacity of new knowledge and ideas of most employees;

– workers' idea about possibilities of other subdivisions is broadened, thanks to what interaction effectiveness between subdivisions is increased;

– the updating process of ideas, opinions, approaches to industrial tasks solving is launched that, in general, increases company personnel readiness to more complicated projects;

– experience of organization and teaching realization of other employees that increases employees' responsibility for their professional advancement and company competence.

As a whole most of personnel take part in developing education that influence the internal environment in a favorable way: psychological climate becomes better, company appeal goes up, cadre personnel stability grows and correspondingly innovative business potential increases, and also its value and competitiveness.

The offered procedure of professionalism management has significance not only for personnel training enhancement, but for creation of corporate knowledge management system, as it includes tools of build-up, generation, systematization and expansion of new knowledge within a company, development of special competences for innovations implementation, and accordingly the growth of intellectual capital.

Essentially such a system of innovative personnel development assures the company ability to study faster than others that, as is well known, is the main competitive advantage of any business.

3.5 Cadre Safety of the Innovative Enterprise

Cadre safety is the most important component of economic enterprise safety as personnel are primary for its any component (financial, informational, technical and technological, jural, ecological). Cadre safety securing is the system, the complex of measures in regard to risk prevention connected with personnel, their intellectual potential and working relationships as a whole.

Cadre safety securing measures are expedient in the following situations:

– while selecting candidates to vacant posts;

– while working with worker's association;
– in the time of official hearings because of emergencies;
– while planning a release of employees;

Cadre safety of IE must be built according with several directions: observance of fixed measures while engaging personnel, their adapting and discharging, assuring personnel loyalty to an enterprise and designing of a line of measures connected with the implementation of confidential office-work and the routine of a trade secret. To some extent, it is able to prevent the ability of a disclosure of a certain part of information in the interests of third party.

In such a way cadre safety is directed to similar work with personnel, fixing such employment and ethical relations which could be determined as breakeven. All this activity is not a single direction in manager functional of personnel, but joins to it. And here practically any additional resources are not involved subject to all stages of organization and HR Management are present in a company.

Safety securing is one of the most important problems that arises before any domestic enterprise. In the general innovative enterprise management sub system a safety securing system is closely connected with a HR Management subsystem.

The HR Management aim in the innovative enterprise securing system as well as the aim of done work is the search of ways connected with minimizing of risk and threats from employees' side.

The measures complex connected with cadre safety is the process of prevention and minimization of risk and threats from personnel' side:

− selection of experienced and reliable employees;
− control of reliability and loyalty of personnel in dynamics;
− timely exposure and localization of causes and threats circumstances;
− accurate elimination those who create any threats to business.

Types of threats from personnel's side:

1. A theft of enterprise property.
2. Use of enterprise resources in personal purposes.
3. Deliberate spoilage and destruction of enterprise property.
4. Receiving of a salary for undone work.
5. Blackmail with competence (I am an indispensable worker).
6. Blackmail with powers (concentration of powers in one hands).
7. Trade of business secrets.
8. Disciplinary violations.
9. Creation an unbearable, moral and psychological climate in a collective.

The first thing that minimizes all these threats is an effective and correct assessment of candidate reliability. It is necessary to organize a selection system of candidates in the view of risk tendency assessment to destructive behavior at work in

order not to have problems afterwards.

It is necessary to keep the following tendencies in cadre work – to carry out a serious and all-round selection of employees, where people who are able to damage company interests are not allowed to work. It is necessary to pay special attention to people the most subject to enlistment – secretaries, cleaners, system administrators and other persons who know commercial secrets or are able to know.

All who has access to company information, innovations, assets and reserves are subjected to enlistment. It can be any key employee. And the list of such risk jobs should be compiled separately. The question of personnel safety is to estimate how these employees with their moral qualities are stable or predispose to such enlistment. The low level of stability and moral readiness to the negative behavior against a background of trade secret awareness are the materials for analysis and immediate organizational arrangements of the innovative enterprise leader.

In the current context it is necessary to talk not only about the defense from rivals` agency penetration or criminality, as well as the government institutions penetration. This question is not only the safety competence, but the employees of personnel department should know the main mechanisms of penetration and agency revelation. The main signs of agency penetration attempts in the company with the help of job placement can be the next features:

–the candidate is a job-hopper, who frequently change the place of residence, usually every 3-6 months;

–unaccountable blanks (“mismatches”) in the biography;

–discrepancy amid the education and the position, which the candidate occupied;

–hiding of education knowledge, skills or workplace, received awards;

–work in rival organizations;

–availability of previous convictions;

–work in nonexistent organizations;

–excessively broad spectrum of official interests and skills;

–work in authorities, military service (including various special forces), in protection (detective) or positions, supposing active contacts with law enforcements or intelligence services;

–candidates have good health;

–pretends to key post, but is appreciably lower his/her abilities;

–refuse other posts, even with better conditions;

–is unable to make a decision immediately (“I need to think about it”);

–the candidate has not bad habits, looks like an agent (including such temperamental attributes like persistence, charismaticness, observation, reticence and obscurity, ability to talk idly, etc.;

–have a lot of connections in different spheres.

One more sign can also be the revelation of an attempt to penetrate through other channels.

One should differ external and internal treats. External negative impacts are an action, phenomenon or processes that don`t depend on enterprise employees` will and consciousness, dragging prejudice. Internal negative impacts include actions (designed or careless) of enterprise employees:

–weak control system organization of HRM;

–weak training system organization;

–ineffective incentive system;

–mistakes in personnel resource planning;

–quantity reduction of innovation proposals and initiatives;

–departure of qualified employees;

–absence or "weak" corporate policy;

–poor checks of employees when entering employment.

External ones include:

–rival motivational conditions are better;

–rivals` aims at enticement;

–from without pressure on employees;

–changes in external economic environment;

–employees` hits in different kinds of dependence;

–inflation development.

All these external negative impacts influence the processes inside the enterprise, in whole, on its cadre safety.

For today, innovative enterprises owners, senior managers, specialists, who are responsible for business safety, consider that personnel safety is an indispensable and major component of economic safety system, which is formed by the organization for its protection.

Business economic safety consists of appointed set of actions:

1) financial safety – questions of financial and economic enterprise activity, paying capacity and other "money" questions;

2) force safety is a regime of person`s physical safety, leader`s body-guard, crime opposition, interaction with law enforcement agencies and other state structures;

3) information safety is own guarding. If it is necessary includes research and information operations, reconnaissance;

4) technological safety is a formation of technological base and equipment of technology and business process, which intensify enterprise competitive ability on the market;

5) safety in rights is law guaranteeing of enterprise activity: relations with state, partners, rivals and suppliers, etc.

6) personnel safety is people, whom the employer trusts his assets, resource and whom delegates powers for realization all about mentioned actions.

3.6 Corporate Innovative Culture of the Enterprise

Modern leaders want their companies to be more innovative. To do this, it is necessary to form corporate innovative culture.

Innovative culture is based on 6 elements: resource, processes, values, behavior, climate and success. These elements are interrelated. For example, company values influence the behavior, workplace climate and how success is defined and measured.

When it comes to innovations procurement, companies usually pay a lot of attention to resource, processes and success which are easily measured innovation elements. Hard measurable human elements of innovative culture – values, behavior, and climate – receive much less attention. It is not surprising, that major of companies manage better innovative resource and measurable success indicators, than elements connected with people. As a lot of researches say, it is really difficult to work with intangible elements of innovative culture (values, people`s behavior, climate on the workplace).

VALUES. Values underlie company priorities, decisions and positioning, which reflect how the company spends its time and money. Properly innovative companies are generous in their investments in entrepreneurial spirit and creativeness approval and encourage permanent trainings. Company values are not things about which its leaders talk or write in the reports, but things they do or invest in. Values are reflected in how people behave and for what they spend their money and not how they talk.

BEHAVIOR. This element of innovative culture organization reflects humans` actions in the process of innovation creation. In relations to the leaders it is a question of such actions like readiness to contribute current products for new and better ones, to inspire employees with future pictorial description and to overcome bureaucratic hurdles. Employees' actions in support of innovation imply persistence in overcoming technical difficulties, “resource getting” in the context of limited budget, taking into account consumers` opinions.

CLIMATE. Climate is a mode, which is maintained in the working medium. Innovative climate cultivates employees` engagement and enthusiasm, promotes people to show initiative, risk in safe environment, to train and think independently.

RESOURCE. Resource consists of people, systems and projects. People,

especially “innovative enthusiasts” are the main factor, as they have a profound effect on values and organization climate.

PROCESSES. Processes are the ways, which innovations follow in the process of their development. One of the most famous processes is “innovative funnel” which is used for catching and culling of the ideas.

SUCCESS. In innovations success can be reached on three levels – external, corporate and personal. In particular, external recognition shows how much innovative the company is for customers and rivals, give innovations tangible financial results. In general, success reinforces values, behavior and processes in the company which in its turn, affect certain actions and decisions: who will be encouraged, who will be hired, what projects will receive the “green light”.

These six elements can be seemed as abstract, but truly innovative companies have at least one of these elements. Let’s consider striking examples of the implementation of some elements.

Each of these six elements of enterprise development model of innovative potential consists of 3 factors (in common 18). In its turn each of these factors includes 3 components (in common 54). When we move from the more abstract elements to more specific components, innovative culture becomes more measured and managed. For example, the abstract element “climate” includes safety factor, which is formed from openness, honesty and trust. Creative, in such way, a model from constructive elements, special test was developed. It allows leaders to understand how innovative the culture of their organization is.

Those who participate in the survey, should put the points for their organization for each of the 54 components on a scale from 1 to 5, where 1 is not at all, 2 - slight, 3 - moderate, 4 - more 5 - in the highest degree. Grade Point Average (GPA) for components then results in average value to receive factor score and the factor average value is the score of elements. GPA of the six elements is called group “innovative coefficient”. Pay attention that survey value increases with the sample size - especially when the respondents are at different levels of the corporate hierarchy and in different divisions of the company.

The innovative coefficient can be used for the comparison of a common level of companies innovation, subdivisions and teams from different regions. However leaders think the main value of innovative coefficient is his ability to allow estimating factors and components of a culture stimulating innovations. It gives leaders a simple map for understanding that allows focusing on strong and weak spots of its organizational structure.

The bigger the organization is, the more it opposes to changes. This regularity shows itself in transnational corporations in the brightest way. Leaders often complain about this fact that employees perceive new strategies negatively, projects

are implemented badly in the scales of the whole company, subdivisions are insufficient of standardized processes, and corporate subcultures are disconnected.

A structured assessment of the corporate culture by means of an innovative coefficient inquirer allows finding out how much such complaints are well-founded. For example, a transnational company producing medical equipment wanted to build its activity on the base of a coordinated international operational strategy. But as early as in two years after the starting of a company leader's program they began to speak about big complexities induced by cultural distinctions between European and American subdivisions, and also between a development department and industrial groups. Surprisingly surveys did not reveal distinctions between answers of different subdivisions regarding any one of six elements – that implied problems were caused due to other factors.

The news that people in different subdivisions thought and acted more similarly than it was supposed earlier influenced seriously the company leadership. Having understood problems were provoked not by cultural distinctions at all they managed to use effectively the cultural community of groups to put in order more close collaboration between them.

The inquirer does not imply you will manage to get the balance of elements or factors that form them. Companies where some factors receive a very low assessment, and others, a very high, can be entirely successful innovators.

After the investigation of survey results leaders can get the accurate idea supported by facts about strength and weakness of their culture, and then concentrated on specific spheres where improvements are the most necessary and will be compensated with the biggest probability.

Most leaders want to correct the situation immediately in those spheres where scores were lower, but it was discovered that it is more efficient to focus on using of the strongest sides of an organization. For example, a large European insurance company created a special subdivision to make an organization more innovative, but soon after it found out the subdivision cannot succeed those results which the leadership relied on.

Estimating innovative company development problems leaders of the company found out that the subdivision did not involve people from different levels of the organization in its innovative initiatives. It led to the climate forming where collaboration was insufficient. But the same assessment revealed employees aimed at being innovative and creative. They even believed themselves to have enthusiasts and talents within the company which will make their innovative initiatives successful. Having understood it leaders came to the conclusion they had just to unite people in the organization to make ideas real.

Leaders who want to alter the corporate culture in their company having made it

more innovative often try to do a lot of things at the same time. It is better focus on certain directions, and then use this success for more wide-ranging changes. The corporate culture change very slowly. When people are invited to take part in changes they, as a rule, resist – someone shows disregard, and someone sabotages innovations actively. In such situations it is better show everything, but not tell encouraging enthusiasts seriously.

It is very difficult to change deep-rooted persuasions and behavior and instantly come to the new definition of success (it can be performed quickly only in the time of domestic or international crisis). Leaders must take aim at small triumphs to obtain better results – at least, at the first time.

Using innovations estimating tools – such as the innovative coefficient inquirer - can become the first step to success of companies that intend to improve their innovative structure. Designing the plan that uses survey results to improve the innovative organization culture companies have to start concentrating on strong sides, alterations and slow scale increasing.

Section 4

CREATIVITY IN BUSINESS

4.1 Essence of Creative Management

The creative management is closely associated with the innovation management, which operates with the intelligent product. Creative management is implemented at the pre-project and project stages of the innovation cycle, and considers the innovation product as a complex structure. Accordingly, the associated management on creation of new knowledge and skills system should be in a certain way divided into a number of components. Thus, we can say: the innovation management on one hand and the creative one on another have the same object of research, but in one case it is studied exteriorly as a final product (innovation management), otherwise – interiorly, as the process of creation (creative management). It should also be noted that the creative management should be directed to the full disclosure of the creative abilities of people.

Introduction of the creative management to the teaching and learning process activates mastering of knowledge and skills, as the using of qualitatively different analytical tools raises the creativity to the higher level.

Creative management is closely associated with the development of such management directions as personnel management, strategic management, innovation management, "self-management" organizational culture of enterprise and marketing.

Experience shows that the use of creative and heuristic methods in scientific and technical creativity allows increasing the scientific and engineering teams' efficiency by several times. However, this vast experience is hardly used to improve the decision-making in economic and organizational areas.

Teaching of relevant disciplines in turn requires a completely specific approach, based on the creative development of the individual.

Activities of future managers involves work with people, necessarily aimed at strengthening and better using of creative potential of the group (creative management), and at encouraging of the staff to intensify their intellectual abilities. There is a contradiction between the continuous growth of the content knowledge and low creative level of students. A number of researchers state that the development of

intellectual and creative potential of young people is at the lower bound of the average norm. At the same time it was determined that high rates of creative potential of individuals and personal qualities of future managers influence the effectiveness of management activities and their personal fulfillment.

Thereby, the program of creative capacity building of future managers in innovation activities should include the following areas:

- gaining of skills and knowledge of creative thinking formation;
- study of methods of creative tasks solving;
- ability to apply creative approach forms to the management activities.

Creative management fosters the skills of nontrivial creative solutions in management and business.

The following main objectives can be distinguished within the creative management:

- assessment of creative potential of the specialist, who will be involved in the solving of creative tasks;
- creation of creative environment in the team, that has worked for a long time and has its own traditions, informal leaders, reasonable role- functions distribution;
- formation of expert groups evaluating the proposals, particularly in the field of innovation policy;
- creation of temporary creative teams;
- evaluation of dominant motivational drives that require the application of professional creative abilities;
- definition of heuristic methods, operations and techniques that need to be studied for better and instant solving of creative tasks by professionals included to the temporary creative teams.

4.2 Basic Approaches to Understanding of Creativity

Today, creative management is considered as the most important indicator of successful development of individual enterprises, companies and the economy society in general. To survive and thrive, take a leadership position and keep them, you need to constantly create new products and services, occupy new market niches and so on. Only under such an approach to the most important intangible asset of business - creativity, the West could reach a breakthrough to the market of new technologies. This approach is shown in the Figure 4.1.

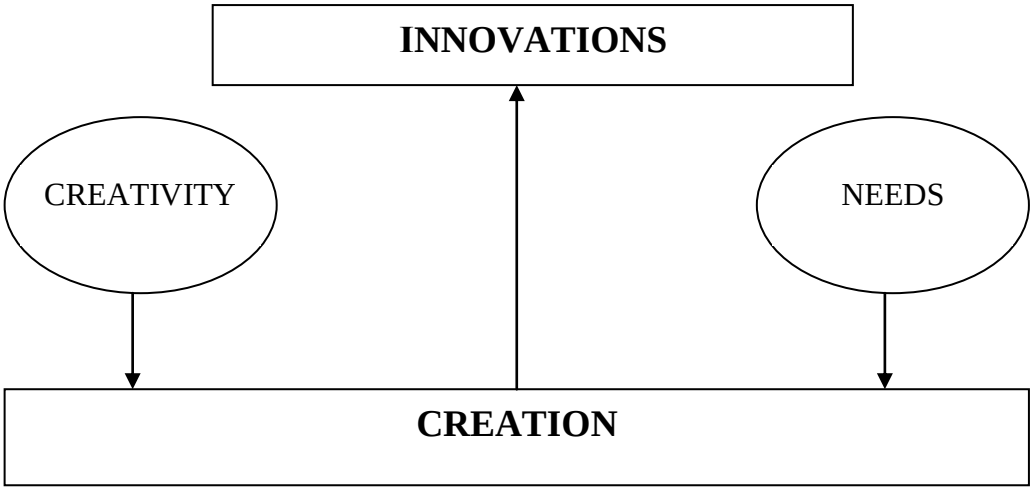


Fig. 4.1 – Research and development in the future

The first time Business Week magazine introduced the concept of the creative economy was in August 2000. Then John Hawkins in his aptly named book "Creative Economy" (2001) attempted to trace its global influence. He divides the creative economy into fifteen branches of "creative industry", including programming, research and design development and creative content industries such as cinema and music. These industries produce the intellectual property in the form of patents, copyrights, trademarks and original designs. In 1999, Hawkins estimated the approximate annual income from these fifteen creative branches at 2.24 trillion dollars. Creative Industry of the United States is an absolute global leader: its income of 960 billion dollars amounts to over 40% of the aggregate income, at the same time the quota of the United States in global spending on R&D was also 40%.

Thus, the whole management system comes into the new phase of development and it will face new interesting discoveries, particularly in the understanding of the creativity basis.

At the same time applications of creative management are associated primarily with innovations and new developments. It is necessary to address the creative management problems just because it is absolutely essential to improve the quality of management decisions and their intensification at all levels - from the national to the individual workplace. Creative management provides methods of preparation of output information for decisions makers.

The use of non-standard creative ideas and solutions in business and management is a direct result of increasing of competitive struggle intensity that requires new marketing ideas, improvement of advertising and the expanded use of non-traditional instruments – mosquito and event marketing and the like. At the same time, strategic management is impossible without creative thinking. The development process of the enterprise mission and its strategy is the process of creativity and even art. Innovation

management requires more creative solutions, creative initiatives managers and executives. At the same time, it should be borne in mind that creative solutions are always characterized by a high degree of risk and even by unpredictability. Therefrom the problem of art and scientific approach combination arises in management: "The combination of scientific approach and art in the preparation of solutions are inherent in business, and the problem is that each approach can find its own place."

Many experts state that creative solutions are used in cases where there is no sufficient information for making rational decisions, when it is difficult to establish cause-and-effect relationships, to predict the consequences of decisions and therefore we have to depend on the intuition.

Corporate Research Foundation specified six key factors of enterprise success:

- structural flexibility,
- staff,
- innovative capacity,
- increasing market,
- international orientation,
- management quality.

It should be noted that structural flexibility and innovation potential are based on creativity. Qualitative creativity is an essential component of the successful company market promotion. It is able to distinguish the company among competitors, inform a consumer about the commodity heading uniqueness and methodically accumulate the brand capitalization. The processes of globalization of economic space will soon arrange business according to the creativity trademarks. This is primarily due to the fact that any properly created image works both by itself and conceptually. The systems view of creativity is shown in the Figure 4.2.

Today’s organizations need to find new images and forms that will help them to transform into so-called intelligent organization. Intelligent organization should focus on the future it wants to create (proactive approach). It’s a key goal - to succeed in the world chaos and uncertainty, seeing them not as obstacles, but as opportunities, when the majority's loss is their gain. The credo of intellectual organization: "Think globally, act locally" and "Think from the future into the present." An integral part of the intellectual organization is its "think tank", a Creative Situation Centre (CSC), designed for the purpose of strategic planning and supervisory control of the organization. Creative situation centers allow to improve the quality of management decisions primarily through the use of systematic and creative approach to the development and implementation of management decisions. To manage creativity effectively, it is necessary to know management approaches and therewith understand the peculiarities of creative activities.

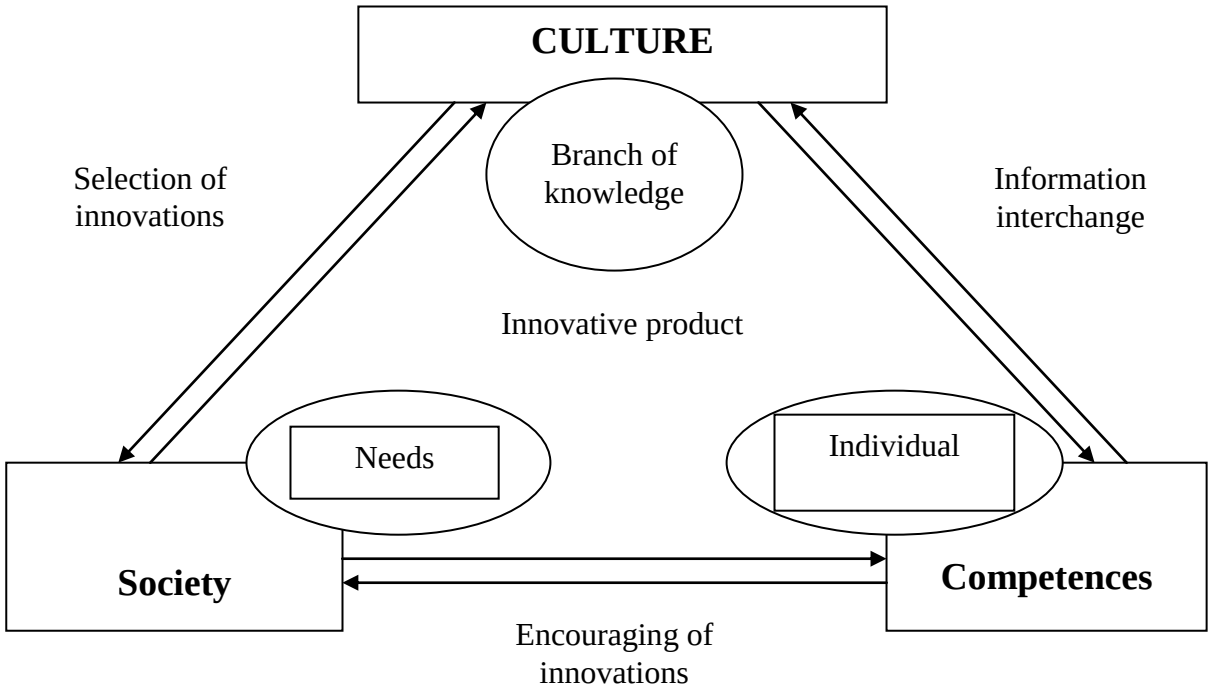


Figure 4.2 – The systems view of creativity

Mastership of these elements will allow creating of a strong creative service, where the emergence of innovative ideas is the result of well-built creative process control, which is possible only with the help of appropriate technologies.

Thus, the creative scope of the company is one of the most difficult areas to predict and achieve results, determine the possible prospects of innovations implementation.

4.3 Creative and Entrepreneurial Capacity Building

Adoption of new branches of scientific knowledge and types of activities is complicated and difficult process, therefore it is necessary to consider the conceptual basis of creative management.

In economics it is advisable to use the term "creative management decisions" instead of the term "artistic management decisions"

Creative management decisions - creative solutions in the field of management, development process that has a creative nature, and the results have positive impacts on enterprise staff, its partners (including consumers) and society in general. According to the type of thinking - rational, creative and heuristic, several types of such solutions can be distinguished. Thereby the heuristic solutions based on the

algorithmised creative thinking. Particular attention is paid to the intuitive decisions - rational and creative at the same time. As for the "flashes of intuition", the E.L. Feinberg considers them as intuition - thoughts, intuition - assumptions that belong to different areas of unconscious mental activity.

Systematic and creative thinking - thinking that activates creativity in the process of existing problems solution and in search of new opportunities.

Creative capacity of the company can be defined as the company's ability to adopt and implement creative management solutions that contribute to the achievement of company goals and the formation of unique competitive advantages using its own and additional resources. It should be emphasized that the creative capacity of the company is not just a sum of creative capacities of its employees. Its usage is characterized by a synergistic effect of the creative capacity of employees and usage of organizational and economic development mechanism of this potential.

Creative ideas - are understood both as creative ideas and different creative advertising technologies (both psychological and partially algorithmic), without providing any guarantee, but significantly increasing the chance of solving marketing tasks of a moderately gifted individual.

Creative process – few successive stages that lead to success, possibly separated by large time intervals.

Creative capacity management in a particular economy requires regular analysis of company creative capacity, planning of implementation and development of this capacity, appropriate monitoring and assessments of the effectiveness of creative capacity use.

The concept of the creative capacity of the company is based on the general theory of management, but focused on the problem of managing the usage of its creativity capacity and creative capacity of all its employees in the process of development and adoption of management decisions, on the task of improving of their employee training and education, the implementation of modern control methods of creative thinking and decision-making, creation of creative team environment, stimulating the development of the process of self-realization and self-perfecting of employees.

Exploration of the creativity nature shows that the definition of the term depends on the context of its use. Creativity as an object of psychological research was considered by Ackoff and Vergara (Ackoff & Vergara, 1981), who isolated two groups of approaches to the definition of creativity:

- Focused on the search for sources;
- Focused on the process.

The first one includes: the psychoanalytic approach (creativity is the result of intrapersonal conflicts); humanistic (creativity is the realization of creative capacity while eliminating internal and external obstacles); approach of psychometricians (individual creativity capacity is built genetically and can be determined by means of tests).

Approaches of the second group characterize the position of "associationists" who consider human creativity as a result of their ability to find long-term associations in

the process of searching for a solution. Accordingly, there is a thought of the necessity for a clear distinction between "art" and "creativity." So, N.Yu. Hryashcheva and S.I. Makshanov understand the art as the process that leads to the creation of new and consider the creativity as a capacity (internal resource) of a person.

The ability of a person to abandon the stereotypical ways of thinking (Guilford, 1967) or the ability to identify new ways to solve problems (Rogers, 1990) can be considered as the creativity. In this regard, Smith and Carlson consider the creativity as the ability to take material from the unconscious sphere into the sphere of the subconscious mind.

Creating is a process and creativity is a person's ability to work. H.I.Vanyuryhyn emphasizes that "thinking of a manager should meet the challenges of the time and allow to creatively solve problems of economic development, both at national and the enterprise level."

Thus, there are many different definitions of "creativity", but only few of them are suitable for describing the creative process within the organization.

The area, which is in question here, is closely related to the innovation management, which would have to ensure the development of science, industry and social processes in the scientific and technological revolution. However, it turned out that for the successful solution of the tasks it is necessary to appeal to the creativity of a person, capacity of his/her abilities, which can be implemented.

The first one who fully realized this was A.I. Pryhozhyn, who intuitively separated the spheres of innovative and creative management.

Creative (comes from the English «creative») - literally "creative, one that creates." It addresses problems of team management, which cannot be clearly formalized. At the same time, the word «create» in English denotes not only "form" and "create", but also "cause" (feeling), "create" (impressions). This is the basis of the word “creative idea” - «creative», which translates literally as "artistic." However, when borrowing words from English into Russian, this word has got a narrower meaning. Advertisers, advisors, designers use it with a pleasure, meaning by the word “creative idea” the commercial creativity.

Creativity (from the English creativity) - level of creative talent, ability to create, which is relatively stable characteristics. Originally creativity was seen as a function of intelligence and level of intelligence identified the level of creativity. Later it turned out that IQ correlates with creativity to a certain extent, and very high intelligence hinders creativity.

Currently, creativity is seen as an integral function of a person not limited to intelligence and dependent on a complex of psychological characteristics.

Creativity (from the Latin. creatio - creation, formation) - creative, innovative activity, creativity of an individual who is ready to create fundamentally new ideas and is a part of the structure of giftedness as an independent factor. The concept of creativity is defined as an activity that generates something qualitatively new and distincts in uniqueness, originality and social and historical uniqueness. Creativity is specific to humans, because it always involves the creator - the subject of creativity.

According to the above definitions, the creative management is closer to the personal, psychological aspect.

Creative management problems are organizationally associated with the staff management when you need to create so-called temporary creative teams. Creative management, designing an intellectual product, cannot clearly refer to an individual, and is definite the result of the creative team activity. Then we will give the following definition of the Creative Management - "people management in organizations aimed at maximum disclosure and use of their creative abilities at pre-project and project stages of the innovation cycle to generate new ideas at competitive inventions in various fields of human activity."

In turn, creative management based on creativistics is a branch of knowledge about productive collective solving of creative tasks.

Creativistics is based on a number of axioms. Among them are the following:

- a thorough penetration in the problem (the axiom "depth of knowledge") is necessary for the real effective creativity;
- creativity requires the rejection of stereotypes, dogmas and clichés; the creation of something new often is constrained with only psychological inertia, lack of extraordinary point of view (the axiom “eyes blurring”);
- rejection of set patterns cannot be reduced to an absolute, it must be strictly rational, balanced and thoughtful (axiom "throw the baby out with the bath water");
- it is impossible to “create” a creator with the help of any organizational and volitional activities, with purely managerial tricks (axiom "wings are given by nature");
- the science of art and therefore of creative management do not generate the creator by themselves, but allow him to master more powerful and more sophisticated tools for their activity (axiom " to learn how to fly (become self-sufficient)" .

The study of creative processes regarding the creative human activity has a long history, starting with the XVII- XVIII centuries. R.Dekart and H.Leybnits attempted to systematize methods of creativistics. Since 30 years of this century, there is a special focus on emergence of fundamentally new methods of implementation of the ideas developed in this field. Thoughts and tips were replaced by some kind of instructions, wherein tend to reflect a regulated set of specific procedures that embody the creative processes of business activities.

The creative management like any other science has theoretical and applied aspects. The theory of creative management is an integral part of the theory of art. The latter one, depending on the scope of use, has a lot of varieties (theory of scientific and technical, theory of art, etc.), which correspond to types of creative management.

At the same time the whole system of the updated management brings creative management to a new level of science, logic and formality. Creativity is understood as the embodiment of the creative human thought in traditional spheres of life, but with the help of non-traditional ways and in an unusual manner. The secret of creativity lies in the methodology of values creation, which is innovative, lies beyond existing technologies, common standards and rules. If a person creates something

new that goes beyond traditional public perception, it will not be seen immediately. Humanity will take time to understand and appreciate such an intellectual breakthrough, scientific discovery, innovation achievement. However, the creativity has understandable, traditional result, which is estimated easily and quickly. So creativity is first of all a contradiction, a conflict.

Creativity is the ability, the property of the person to overcome the utility of traditional modes of production, social perception, consciousness and behavior principles in order to achieve socially important values.

4.4 Search and Generation of New Ideas

Escalating competition enhanced financial and intellectual capacity force businessmen and company chief executives to apply the methods and sources of nontraditional solutions creation and search for authors of innovative ideas to increase the efficiency of business. The demand for creative solutions grows. Creative activity is on the basis of getting the innovative solutions.

The line that separates acceptable and unacceptable creativity is very thin. On the one hand, a creative idea is based on the experience and previously found solutions, uses emerged knowledge and patterns, and on the other - it is isolated from the usual logic that is illogical. This isolation of creativity from the logic, proven by experience, creates the risk of taking it as an empty idea imagination. The main features of creative ideas can be summarized as follows:

- creative idea, as a rule, stays aside from the usual mental “paths”.
- creative idea must be related to the “routine thinking”, so it must work.

Creative may exist at the level of ideas, formation of principles, methods and technologies. Creativity has the following main forms:

- scientific (discovery)
- technical (inventions)
- economic (entrepreneurship)
- artistic (art)
- social (public relations)
- political (public administration).

There are large and small creativity. The first leads to a change of scientific basis: discovery, new concepts and trends. Second one - to the improvement of products, changing of action algorithms, etc.

The authors of creative solutions can be creative people and organizations:

– individual, quite whole and independent by nature persons;
– group of people working and doing collectively;

– individual employees of the company engaged in the advance and the development of innovative ideas;

– company's chief executives, who are engaged in planning and organizing of creative activities, motivation of employees involved in creative activities, their control and regulation.

The emergence of creative individuals and groups inevitably leads to a split in society and strained relations, even to the temporary. Creative people are vulnerable because the field of creative process is beyond the acceptable technologies, regulations, laws. The author always opposes to the world and a creative decision presented in a new form to some extent is the challenge to society, breaks settled norms. Peculiarities of creative approach implementation in business are presented in the Figure 4.3.

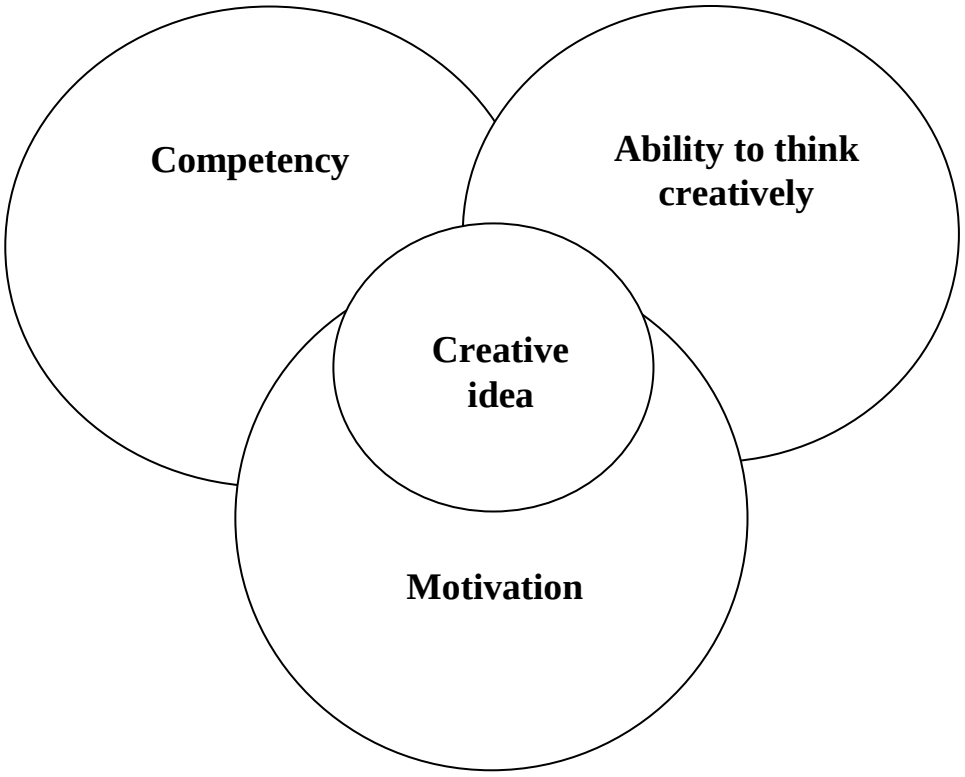


Fig. 4.3 – Creative approach to business

Creativity is an undurable phenomenon, which leaves a deep imprint on society and the authors. The company looking for collaboration with creative authors should clearly understand the consequences of creative solutions and be prepared for them. Top management must decide whether to implement new creative ideas or to use already known and proven technology under the supervision of professionals. At the same time, many entrepreneurs see the success of the company in the creativity, which will allow their product immediately stand out among the market offers.

Creating a competitive business is not enough - you need to present it effectively: create a simple unusual way to come to the traditional in a non-traditional way. Entrepreneurial creativity combines both the continuous generation of innovative ideas and their rapid transformation on the generating customer value and profitable business activity.

Thus, the creative process can be divided into two phases: divergence, when different options to solve problems are formed and convergent when the analysis is conducted and the best solution is chosen.

4.5 Ways of Thinking

A diversity of types of mental tasks causes not only a variety of mechanisms and methods, but also the types of thinking. Psychology distinguishes types of thinking *according to the content*: visual active thinking, eye-mindedness and abstract thinking; *according to the nature of tasks*: practical and theoretical thinking; *according to the novelty and originality*: reproductive and creative (productive) thinking.

Visual active thinking concerns the problems solving through the real converting of the situation and performing the targeted actions. Thus, at an early age, children demonstrate the ability to analyze and synthesize, when they perceive objects at a certain point and have the ability to operate them.

Eye-mindedness is based on images, converting the situation into a plan of images. Such thinking is peculiar for poets, artists, architects, perfumers, designers. The importance of this thinking is that it helps to reflect better a variety of characteristics of the object and set unusual combinations of objects and their properties. In the simplest form, this thinking occurs in the preschool years, when children think visually. It encourages creation of images based on the read and develops creative thinking.

The peculiarity of the abstract (verbal reasoning) thinking is that it does not use the data obtained from some experience. R. Descartes suggested that: "I am able to think, therefore I exist." With these words a scientist underlines the leading role of thinking in the mental activity, namely the verbal reasoning. Visual active, eye-mindedness and verbal reasoning are considered as stages of development of thinking.

Theoretical thinking is the knowledge of laws, rules. It reflects the essence in the phenomena, objects, relations between them at the level of regularities and trends. The products of theoretical thinking are, for example, the discovery of the periodic table of Mendeleev, mathematical (philosophical) laws. The main objective of

practical thinking is the physical transforming of reality. Sometimes it can be more difficult than theoretical, as it often occurs under extreme circumstances and in the absence of conditions to test the hypothesis. Psychology distinguishes *the realistic thinking*, focused on the external world and regulated by logical laws and also *the autistic thinking* associated with the implementation of own desires, intentions.

Some scientists on the basis of three characteristics – lead time, structuring (clear division into stages) and information level (awareness or ignorance) - allocate *intuitive and analytical* thinking. *Analytical thinking* - thinking deployed in time, which has clearly expressed stages, sufficiently realized by a subject. *Intuitive thinking*, on the contrary, is collapsed over time, there is no division into stages, and it appears in consciousness. Considering the intuitive thinking, it is assumed that "intuition is a specific form of knowledge that somehow affects the usage of specific scientific methods of research."

The main types of intuition include sensory (quick identification, ability to create analogies, imagination) and intellectual (advanced reasoning, ability to synthesize and evaluate) intuition.

Also there are productive (creative) and reproductive thinking.

Productive thinking is always aimed at obtaining new knowledge. This type of thinking quite fully educes intellectual abilities and creativity of the person.

Reproductive thinking provides a problem solution, based on the reproduction of already known approaches. New task relates to a well-known scheme of decision. Despite this, the reproductive thinking always requires disclosure of a certain level of autonomy.

Domestic and foreign psychologists (R.S. Kostiuk, J.Guilford) concluded that creative thinking is a set of mental characteristics that provide productive transformation in the activity of a person.

The creative thinking distinguishes originality in problem solving, semantic flexibility that allows seeing the object from a new point of view, figurative adaptive flexibility that enables changing of the object. As physiologists established, many features of creative thinking and people behavior are determined by different functions and levels of two hemispheres of human brain.

The left hemisphere is responsible for analysis, logical reasoning, conclusions, planning, calculation, capacity for science, short-term memory and language. The right one – for feelings, emotions, synthesis, long-term memory, capacity for languages and art. Thus, the left hemisphere of a human is analytical and logical and the right one - synthetic and creative. Thereafter, people are divided into two basic types according to the style of thinking or cognitive differences. At the same time truly creative organizations are distinguished by harmonic use of functions of both hemispheres. It is necessary to focus on a balanced use of both types of thinking.

Creative thinking is considered as the ability to create new significant knowledge and forms, which have a great socioeconomic success.

Traditional way to solve problems is based on the *convergent (vertical thinking)*. The problem is solved logically, according to the plan and only rationally. It is considered in one selected direction and remains within the investigated theme. Critical comments improve the convergent thinking. As a result, we get only the right decision. *Divergent (lateral thinking)* - the gaming, associative, open and random. It is happening in range of areas and departs from the topic. Critical comments interfere with divergent thinking. As a result, we get a lot of innovative solutions.

Thus, creativity can develop as one of the personal qualities, but it is necessary to take into account the aspects independent of human, such as success or type of a person.

Generally, there are two possibilities to improve creativity:

• try to develop new, unknown styles of thinking in order to perform tasks more variative,

• to improve yourself in particular, already known style of thinking.

Especially, Edward de Bono defines creativity as the development of techniques using creativity and lateral thinking.

4.6 Heuristic Methods as the Basis for the Development of Creativity

Exploring the methods for purposeful solving of creative problems note that the creative task became more complex, and methods for their solution hardly improved. Typically, the creators went to the goal by "trial and error". Gradually, this led to the idea to arrange somehow the search, find the rules of entering the "right decision" and create a science of solving creative problems - *heuristics*.

The word "heuristic" first appeared in the writings of Greek mathematics Pope of Alexandria (second half of the III-rd century AD). Subsequently, many prominent scientists, including Descartes and Leibniz, referred to the necessity to explore the creative thinking. The confidence in the principle recognizability of creative processes strengthened, but the inventors continued (and still continue) to work by "trial and error". Trying to solve the problem with this method, an inventor proposes an idea, and then verifies its applicability.

All the variety of methods allowing you to generate ideas can be divided into three main groups:

- Methods based on psychological activation of creative thinking;

- Methods systematizing and activating the enumeration of possibilities;
- Methods of purposeful solution of creative tasks.

Methods of creative thinking activation designed to overcome psychological barriers preventing creative thinking. Teamwork fundamentally changes the nature of the interaction between members of the creative team, thereby it is much faster to gain understanding than with the help of conventional talks. All participants work as if they lay their hands on a lamp of clay, by joint efforts trying to mold something that is consistent with the shared sense of the goal. To develop the creative person it is necessary timely and effectively to appeal to the subconscious functions. Group methods of creative abilities are productive, if the psychological barrier protection is cleared through proper organization of group communication.

The method of *brainstorming* appeared in the United States in the late 30's and in 1953 with the appearance of the book "Controlled imagination" by A. Osborne it finally took shape and became known among wide range of professionals. The book revealed the principles and procedures of creative thinking. A. Osborn predicted that the birth of new, non-standard ideas "slows down" the nature of human consciousness, which manifests itself in a subconscious desire to "criticize" any idea. In other words, any of us has hidden personal "censor" that filters out ideas on the "pass - fail" principle, starting out from their own notions of the "generally accepted principles", their previous personal and social experience, subjective perceptions of "rational and irrational." Besides, each of us, presenting a particular idea, is afraid to come under the strong criticism of colleagues, chiefs, subordinates, all those who in some way may be interested in our creative initiative. Based on these conclusions, A. Osborn proposed a simple approach - to distribute these two processes in time and space: the generation of ideas and critical analysis of ideas. Herein these ideas are developed by the group of "generators" and soon as they become the fruit of collective creativity, they lose their "personal" authorship. According to A. Osborn, it helps to release the creative potential of human consciousness not prostrated with fear to be caught by "the scissors of the censor."

The structural method is quite simple. It is a two-phase procedure of problems solving: at the first phase, ideas are advanced and at the second, they are specified and developed. The expression “brain-storming” proposed by A. Osborne permits several variants of translation. Currently, the most common name of this method is "brainstorming." The most important element of the method is clearing of psychological barriers that slow down the generation of creative ideas. The method distinguishes stages of problem formulation and generation of possible ways its creative solution. Exemplary sequence of actions during brain-storming is the following:

- formulate the problem;

- consider what data can be useful, for example, information about competitors or market analogues;
- come up with all sorts of ideas - "keys" to the problem, continuity of the process of critical thinking is important;
- analysis and ideas testing.

Activities in the framework of these phases must be performed under certain basic rules.

Three of them are at the phase of idea generation are:

- prohibition of criticism,
- prohibition of reasoning of advanced ideas,
- Encouragement of all advanced ideas, including unreal fantastic and crazy.

There is one ground rule at the phase of analysis: to identify the most rational basis in each analyzed idea.

Thus we can formulate the basic rules of brainstorming:

- the group of ideas "generators" should include people of different professions,
- "generation" of ideas are conducted through free expression of any ideas, including obviously false, humorous and fantastic. Time limit - minute. The ideas are expressed without evidence. All ideas are recorded in the minutes or fixed,
- when "generating" ideas any criticism is banned (not only verbal, but even tacit in the form of skeptical smiles, etc.). During the brainstorming free and friendly relations between the parties should be established. It is desirable that the idea advanced by one participants of brainstorming gets the promotion and development among others.

During the examination, it is necessary to think carefully through all ideas, even those that seem to be obviously false or childish. It is advisable to involve people with good creative abilities, high speed of mental processes, easiness in getting into new situations, flexibility, ability to quickly shift their attention from one aspect to another, to participate in the idea generation phase. The ability to stay from conventional settings, psychological "brakes" and restrictions allows expanding the area of capabilities of each of the brainstorming participant. Release of pressure of previous professional and life experience increases sensitivity to very weak associations on the basis of which unexpected, original, and sometimes shocking creative discoveries often are born.

Usually a group of ideas "generation" consists of six - ten people. Duration of brainstorming is short: 20 - 40 minutes. Consider one of the ways of ideas getting. Assume that as a result of the brainstorming we got 4 ideas: idea N1, idea N 2, idea N 3 and idea N 4. These ideas are postponed for a while and a table of the form 4.1 is filled.

Table 4.1

Combination of brainstorming ideas

Ideas	**№1**	**№2**	**№3**	**Idea N 4**
Idea N 1				X
Idea N 2		X		
Idea N 3			X	X
Idea N 4				

Probably not all combinations will be successful, but with such mechanical method it is possible to get some new quality ideas.

The obvious connection of creative management with the science of technical creativity methods, where creative technologies are used with great success for a long time, and with the creation of complex of techniques for creative solutions development. One of the first founders was Altshuller, who developed the theory of inventive problem solving.

The most effective among algorithmic methods for solving creative problems is the theory of inventive problem solving TIPS (theory of inventive problem solving). The founder of theory of inventive problem solving is Genrikh Saulovich Altshuller – an engineer, inventor and a science fiction writer (known under the pen-name Genrikh Altov). The main tool of TIPS is the algorithm of inventive problem solving (AIPS). AIPS is a series of steps that identify and solve existing in the system contradictions. AIPS use a number of creative tools such as the table of technical contradictions elimination, standards for solution of inventive problems, analysis, methods of creative imagination development. In its development AIPS had a number of modifications, which are complex techniques requiring special training to master them. TIPS allows you to "streamline" creativity, demystifies, replacing the throes of creation and joy of afflation with technological, even routine processes that deliver the desired output result. Although initially TIPS was created for technical problems solving, it approaches became universal. Currently TIPS finds new lease of life and new development. On its basis independent directions and schools were established, TIPS methods moved from the technical area to other areas where especially great need for creative thinking exists. Most actively applications based on TIPS methodology are used to solve business problems in marketing, advertising, sampling technologies.

There are three levels in the field of scientific and technical creativity: rationalization, invention and discovery. Each level has its own creativity outcomes, own methods of creativity and thinking.

Rationalization involves improving of existing process or object characteristics.

Invention - the creation of a new product (process) on the basis of existing knowledge.

Discovery - new previously unknown knowledge allowing you to create completely new products and processes.

The first level is connected with the use of rational and convergent thinking, the second and third - with the use of convergent, divergent and lateral thinking.

There are at least two directions of creative problems solving.

Firstly, you can create conditions under which every human action is regulated in advance. So, there is a rigid system of serial instructions for the need to fulfill strictly defined actions (concrete algorithmic direction of problem solving). This is a "machine" method and it by no means can't lead to the creative problems solving.

Secondly, theoretically the other situation is also possible, when are given only some general instructions, guiding the person for choosing the correct area of work (algorithmic in a generalized sense problem solving direction). There is nothing of "machine" in this method.

The Walt Disney Creativity Strategy can come in handy. Its essence is that during the "brainstorming" the process of new ideas generation is separated from their critics and this eliminates the internal barriers. Walt Disney in his thoughts stood three characters in the corners of his room - the Dreamer, and the Critic and the Realist. Then in turns projected himself into each of them. Taking the corner of the Dreamer, he invented new ideas and fantasized. Having moved to the Critic's corner he sought for shortcomings and weaknesses, pilled the Dreamer's pipe dreams to pieces. Turning into the Realist, Disney weighed all "pros and cons" and sought for the optimum alternative. The effectiveness of this strategy proved by the whole career of W. Disney, who had come a long way from a poor animator to a creator of a multibillion empire and became one of the most successful businessmen.

A special group of methods of this group is a technique based on the use of trance states. The method which Salvador Dali used to obtain ideas for his brilliant paintings. Taking in his hand a metal spoon, he snuggled down in his armchair and put the bowl on the floor next to him. Then he completely relaxed and began to doze. At the time of falling asleep his fingers involuntarily opened, the spoon crashed down into the bowl. Then he awoke and at that moment saw fantastic images. The method invented by Salvador Dali was the basis for specialized technique, which contributed to the birth of new ideas. The state on the verge of sleep and wide-awakeness is generally very productive for creativity, it was used by great Leonardo da Vinci, who fell asleep every three hours for 15 minutes.

The Ericksonian Hypnosis (named after its creator Milton Erickson) uses the capability to spontaneous trance state, which is inherent to each person, so there are

no people who “cannot be affected”. Thus, if previously Ericksonian Hypnosis was used mainly in psychotherapy, from now its use has spread to different areas and it became available for everyone. The principles at the origin of Milton Erickson approach are the following:

- natural trance state;
- unconscious can work productively and independently;
- each person has at his disposal necessary resources;
- trance state activates these resources.

Besides the technique, where the expert "client" dips the "client" into the trance state, there is a technique of self-hypnosis. For instance, the *self- hypnosis technique of Betty Erickson* is very interesting and easy to learn.

There are a lot of methods of ideas systematic search, the most well-known among them are *the method of test questions for the method of focal objects and morphological analysis.*

The method of test questions is used for better understanding of the problem with the help of questions that are raise in a defined sequence. Sufficient amount of lists of test questions were developed for various fields of activities. Here is one example of them:

1 What is the main function of the object?

2 What is a perfect object?

3 What will happen if there is no object?

4. In which fields this function is carried out and whether it is possible to adopt a solution?

5 Is it possible to divide the object into parts?

6 Is it possible to put into motion the immovable parts?

7 Is it possible to exclude previous operations?

8 What additional functions can the object perform?

Method of focal objects is simple and has unlimited possibilities of finding new perspectives on the solving problem. It is based on establishing the relations between the focus and the occasional word and involves the following steps:

1 Focus being defined (our object).

2 Choose random nouns - open the dictionary and randomly choose words.

3 We select the chosen nouns corresponding to the meaning of adjectives.

4 Connect adjectives to p. 3 with a focus on claim 1 and seek solutions in emerging associations;

5 Evaluate received options and choose the best one.

Among methods of this group the world's most popular is the morphological analysis. The founder of morphological analysis is the representative of alchemical elite of his day, philosopher, theologian and missionary Raymond Lulliy (1235 -

1314), whose ideas Swiss astrophysicist Zwicky developed further. The principle of the method is the comparison of similar objects and determining their essential components. The main tool is the construction of so-called morphological box – table, "head" of which is constituted from the essential components of the selected system, and the columns are filled with possible ways of their display. Choosing random variations of significant components we receive their new combination and thus a new system.

Section 5

INTELLECTUAL PROPERTY PROTECTION

5.1 Different Types of Intellectual Property

Patents are granted for technical inventions. Applications for patents are examined by the patent office they are filed with, in order to determine whether they meet the stringent requirements for a patent to be granted. Patents generally last for a maximum of 20 years from the date of filing.

Utility models offer simpler protection, for a shorter period of time, but are usually registered and published much more quickly than patents.

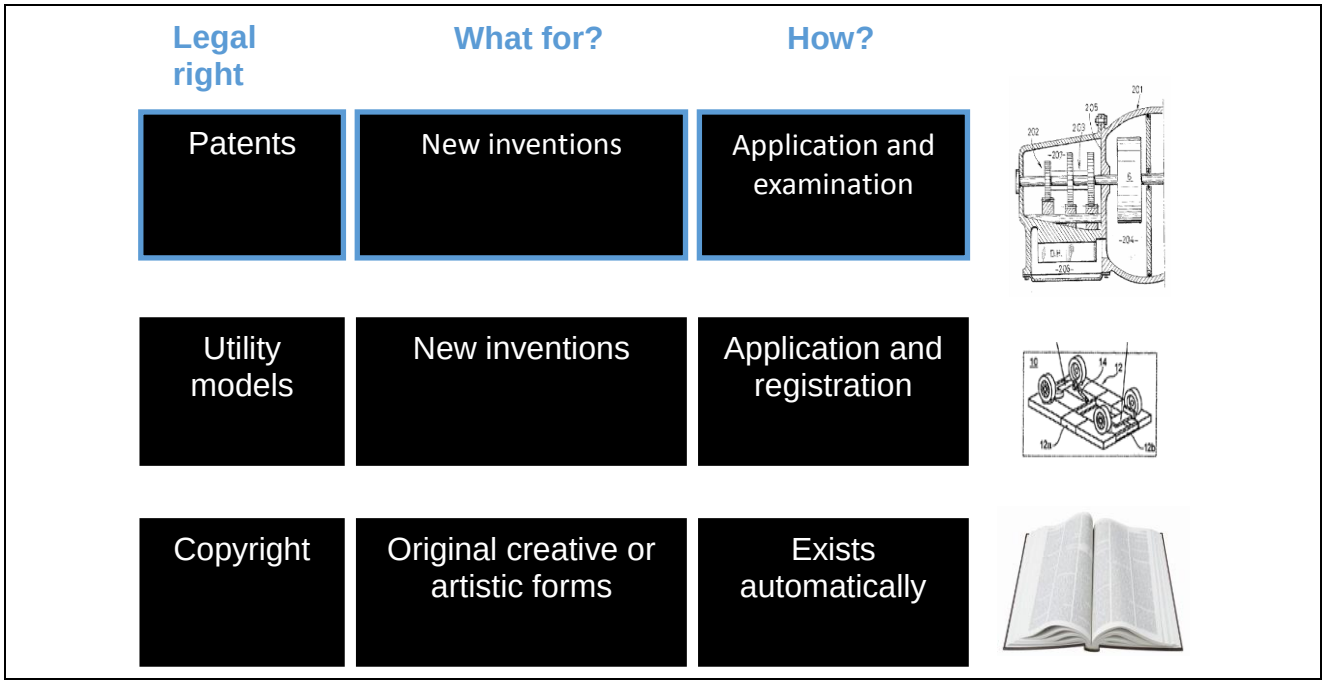


Fig. 5.1 –The different types of IP (I)

Copyright does not need to be registered. It automatically exists when a work is created. It protects any type of original, creative expression, including literature, art, drama, music, photographs, recordings and broadcasts.

Trademarks are distinctive signs indicating the source of a product or service. They include, for example, names, logos and colors applied to the owner's products or services, which distinguish them from products and services provided by competitors.

Registered designs protect the external appearance of a product. They do not give any protection for technical aspects. They include new patterns, ornaments and shapes. To be officially registered, designs need to be original and distinctive. The artistic aspects of a design may also be protected by copyright.

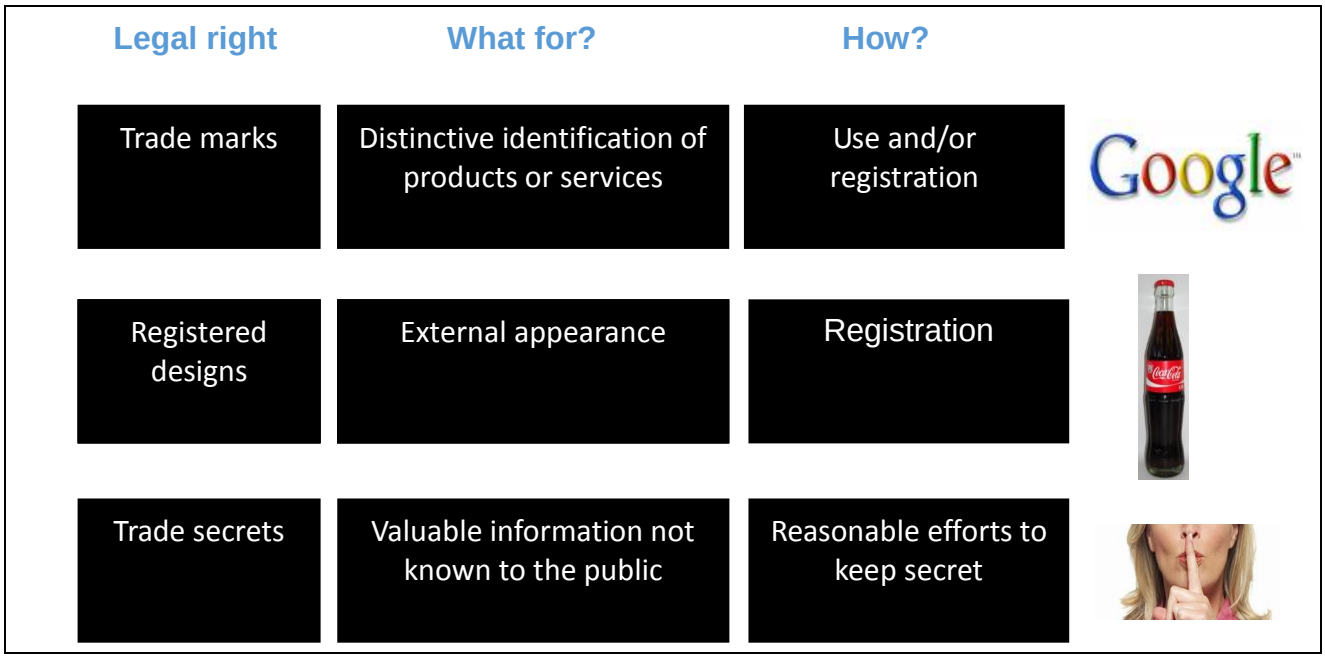


Fig. 5.2 –The different types of IP (II)

Unregistered designs also enjoy some protection. An unregistered design is a free, automatic right that you get when you present a design to the public. It gives you the right to stop anyone from copying your design. The protection afforded by an unregistered design is normally of more limited duration than that available for a registered design.

Trade secrets are an alternative to patents. They cover information not known to the public. If the possessor of the information is careful to keep it confidential, he can sue anyone who steals it.

All the IP rights described so far can be used in combination to help inventors protect their innovations. For example, a company might use a patent in order to ensure that it is the only one that offers a particular technical feature, and registered

or unregistered designs to protect the features relating to the appearance of the product. It can also use trade marks to communicate the source of the product. It might also choose to keep some aspects of the production process secret. If it makes serious efforts to maintain secrecy then it can enjoy the protection of trade secret law. Students may well be unaware, for example, of the range of IP it takes to make and market a mobile phone. creations. The terms and conditions for use of the content of the Nokia website in public state that "The contents of Nokia World Wide Web pages are Copyright © Nokia Corporation 2011. ... The use of this site and the content therein, is permitted to private, non-commercial use. The use of press releases and other documents classified as public is permitted in public communications if the source for the information has been stated." This also applies to images available from their website at http://press.nokia.com/media/.

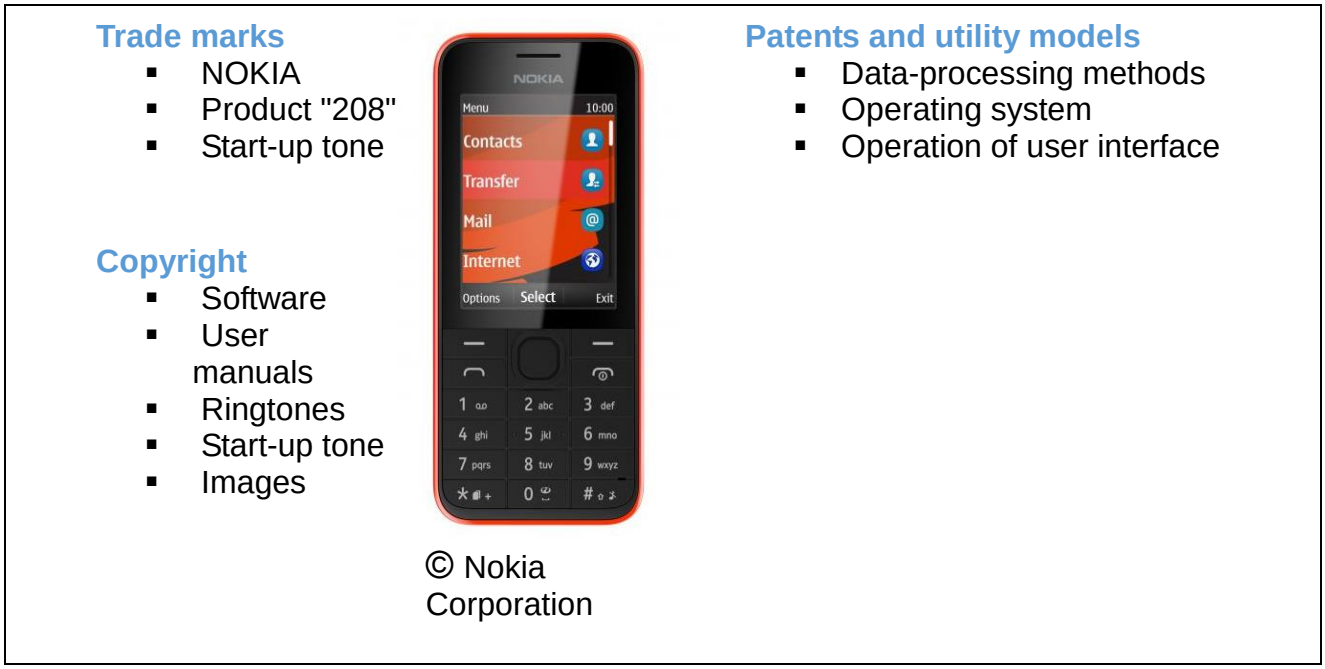
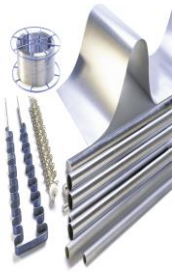


Fig. 5.3 – One product – many IP rights

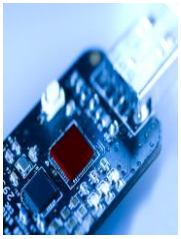
Without IP, many innovative projects would not be profitable, because anyone who wanted to could simply copy the results. This gives some examples of companies which use IP and how they benefit from it.

Sandvik AB is a Swedish developer and manufacturer of high-tech tools and machinery, with 50 000 employees in 130 countries. In 2012 it was named one of the world’s 100 most innovative companies. Sandvik's subsidiary company, Sandvik Intellectual Property AB, holds and manages the firm's IP, including 8 000 patents.

- IP is an essential business asset in the knowledge economy
  - Sandvik AB: innovative high-technology tools and steel technology



  - ARM Holdings: licenses its technology to microprocessor companies



- IP protects small innovative firms
  - W. L. Gore & Associates: GORE-TEX®

  - Dolby Laboratories: invented noise-reduction technology

Fig. 5.4 – The importance of intellectual property (I)

ARM Holdings is a British multinational semiconductor and software company which earns licensing royalties from the energy-efficient microprocessors which it develops but does not manufacture.

W.L. Gore & Associates was founded by the Gore family in 1958. It developed high-tech products based on a remarkably versatile new polymer. Based on a patent for a membrane technology, Gore developed a special breathable fabric - known under the trade mark GORE-TEX® - that is both waterproof and wind-proof. With over 9 500 employees, it has also trade-marked the phrase "Guaranteed to Keep you Dry®" in the US.

Dolby Laboratories uses a combination of patents to protect its noise-reduction technology and associated trademarks. Founded in 1965, it is a successful high-tech company with over 2 800 granted patents and an additional 2 700 patents pending. It also has over 990 trademarks worldwide. Licensees are obliged to use the Dolby

trade mark on every product including Dolby technology. The company makes approximately 86% of its revenue from the licensing of its technology.

The LINUX operating system and other open source software is free to use, but users must accept the General Public License - or GPL - which includes an agreement to put any improvements under the GPL too.

- IP is needed to enable the release of IP into the public domain under controlled conditions.
  - General Public License (GPL): Linux
  - Creative Commons License

- IP helps guarantee standards for public benefit by means of licensed trade marks.
  - Fairtrade International (FAIRTRADE)
  - Forest Stewardship Council (FSC)

Fig. 5.5 – The importance of intellectual property (II)

Creative Commons is a range of sample license for books, software, photos, etc. Authors may grant free use, but may require, for example, that their names be stated or that use be non-commercial.

Fair-trade International, which campaigns for fair-traded products such as coffee, and the Forest Stewardship Council are run for the public benefit rather than for profit. They license their trademarks - including FAIRTRADE and FSC - only to those companies prepared to sign up to certain environmental and/or moral criteria. The unlicensed use of these trademarks can be prevented via the IP system.

Whenever a new product is successful on the market, it is very likely that competitors will attempt to make similar or identical products.

The innovator will probably have invested significantly in developing the new product, establishing the supply chain for production, running marketing campaigns and finding distributors.

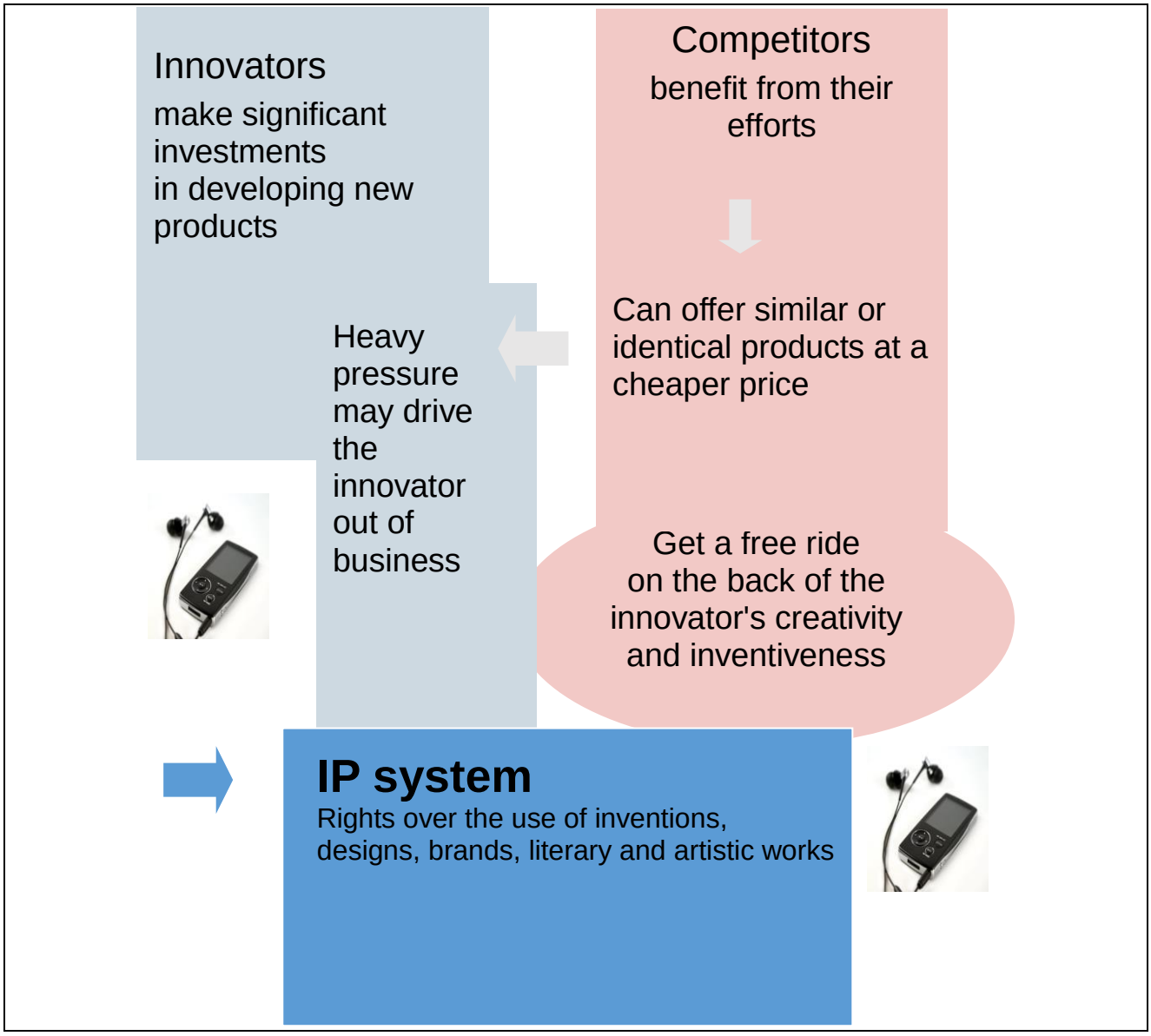


Fig. 5.6 – The IP system

Competitors benefit from these efforts. They have greater market access, a better connection with distributors, and access to cheaper primary resources. As a result they are able to offer their products at a cheaper price.

Innovators are then under heavy pressure and may be driven out of business, while competitors get a free ride on the back of their creativity.

The IP system is there to help innovators protect their inventions, designs, brands, artistic works, and so on. It provides them with ownership over their work and the rights to exclude competitors from the production, import or sale of infringing goods.

Examples of valuable intellectual property.

According to market research companies, the Coca-Cola brand - and its trade mark - is worth around EUR 58.7 billion (USD 78.4 billion).

More than 100 million units of the Apple iPod touch music player were sold between its launch in 2007 and 2013. The iPod is protected by trademarks, registered designs and patents for the user interface.

Harry Potter author J.K. Rowling converted her imagination into the equivalent of 22 000 kg of gold – true IP magic! She earned USD 910 million - approximately one billion dollars, or around EUR 681 million - from her copyright. The Harry Potter brand has been estimated to be worth USD 15 billion (EUR 11.2 billion).

In 1991, Kodak had to pay EUR 692 million (USD 925 million) to Polaroid for having illegally used Polaroid's patented inventions for instant cameras.

In 1991, biotech company Cetus Corporation sold the rights to the PCR patents for the DNA copying process to Hoffman-La Roche for USD 300 million (EUR 225 million). Kary Mullis, who developed the PCR, was awarded the Nobel Prize in Chemistry in 1993.

5.2 Patents

A patent is sometimes considered as a contract between the applicant and society.

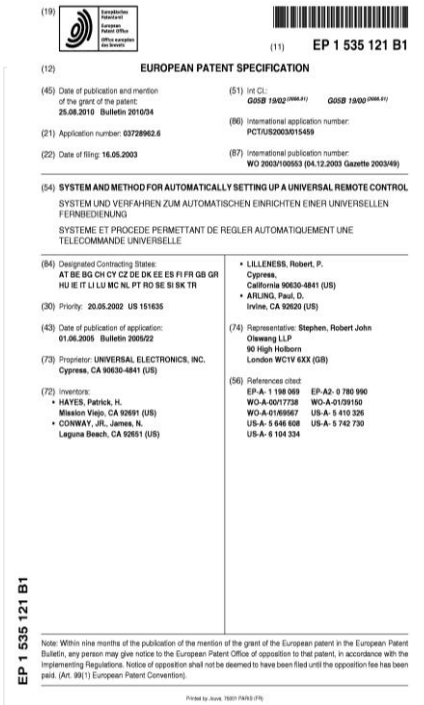
Applicants and patent owners are interested in benefiting - personally - from their inventions.

They have the right to prevent others from making, using, offering for sale, selling or importing a product that infringes their patent, for a limited amount of time and in the country for which the patent has been granted.

The exception to this is use for non-commercial purposes, for example private use or academic research.

Society is interested in:

- encouraging innovation so that better products can be made and better production methods can be used for the benefit of all,
- protecting new innovative companies so that they can compete with large established companies, in order to maintain a competitive economy,
- learning the details of new inventions so that other engineers and scientists can further improve them, and
- promoting technology transfer, for example from universities to industry.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(54) SYSTEM AND METHOD FOR AUTOMATICALLY SETTING UP A UNIVERSAL REMOTE CONTROL

SYSTEM UND VERFAHREN ZUM AUTOMATISCHEN EINRICHTEN EINER UNIVERSELLEN FERNBEDIENUNG

SYSTEME ET PROCEDE PERMETTANT DE REGLER AUTOMATIQUEMENT UNE TELECOMMANDE UNIVERSELLE

(84) Designated Contracting States: AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HU IE IT LI LU MC NL PT RO SE SI SK TR

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US-A- 6 104 334

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Note: Within nine months of the publication of the mention of the grant of the European patent in the European Patent Bulletin, any person may give notice to the European Patent Office of opposition to that patent, in accordance with the Implementing Regulations. Notice of opposition shall not be deemed to have been filed until the opposition fee has been paid. (Art. 99(1) European Patent Convention).

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Patents are granted in nearly every country in the world!

- A legal title which grants the holder
  - the exclusive right to prevent others from making, using or offering for sale, selling or importing a product that infringes his patent without his authorisation
  - in countries for which the patent was granted
  - for a limited time (up to 20 years).
- In return for this protection, the holder has to disclose the invention to the public.

Reveal invention (disclosure)

Get exclusivity (patent)

Patent applicant

Public

Fig. 5.7 – The Patent System

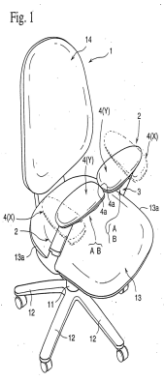
In return for this protection, the applicant has to reveal his invention to the public, so others can build on it. As a rule, patent office's publish applications after 18 months. At this stage they become visible to everyone.

This "social contract" is institutionalised in the form of patent law.

According to the European Patent Convention, or EPC, "European patents shall be granted for any inventions, in all fields of technology, provided that they are new, involve an inventive step and are susceptible of industrial application".

Patents protect inventions which solve technical problems:

- chemical substances, pharmaceuticals
- processes, methods, uses
- products, devices, systems



For an invention to be patented, it must usually be

- ✓ **new** to the world (i.e. not available to the public anywhere in the world)
- ✓ **inventive** (i.e. not an "obvious" solution), and
- ✓ susceptible of industrial

In most countries, patents are not granted for business methods or rules of games as such, or for methods of treatment, diagnostics and surgery on the human or animal body.

Fig. 5.8 –Patents protect of inventions

"New to the world" means that there should have been no previous public disclosure of the invention before the date of filing.

"Inventive step" is quite difficult to assess. To ascertain whether an invention involves an inventive step, the European Patent Office compares it with what would have been obvious to an imaginary person skilled in the art at the time of filing.

The EPC does not define what an invention is. It does, however, provide a non-exhaustive list of subject-matter and activities that are not considered inventions. The items listed at the bottom are expressly excluded from patentability.

5.3 Databases

What is a database? A database is a collection of independent works, data or other materials arranged in a systematic or methodical way and individually accessible by electronic or other means.

"Independent" means that they should be separable from one another without their informative, literary, artistic, musical or other value being affected.

"In a systematic or methodical way and individually accessible" means that the materials should be contained in a fixed base of some sort, and should include technical means such as electronic, electromagnetic or electro-optical processes or other means, such as an index, a table of contents, or a particular plan or method of classification, to allow the retrieval of any independent material contained within it.

Examples of what can be considered a database include the fixture list of a football league, or a phone book.

Scope of protection. In the EU, databases are protected under Directive 96/9/EC on the legal protection of databases. The Directive introduced two forms of protection, namely copyright protection and *sui generis* protection.

A database can be a copyright-protected work if the arrangement or the selection of the content is the author's own intellectual creation. In other words, a database will be protected by copyright if the selection or the arrangement of its content is original. The only relevant criterion is originality.

The authorship lies in the first instance with the natural person who created the database.

Copyright protection covers the specific structure of the database only. The material contained in it is not protected. There is still therefore a risk that all or substantial parts of the contents of the database may be copied, and then rearranged.

In addition to this somewhat limited copyright protection, the database directive also introduced a *sui generis* right to protect the specific investments made by the database maker. Makers have to show a substantial quantitative and/or qualitative investment in either obtaining, verifying or presenting the contents of their database. They obtain the exclusive right to prevent others from extracting and/or re-using all or a substantial part of the contents of the database.

Computer programs used in making or operating databases are excluded from protection.

Rights and limitations. As far as copyright is concerned, the author or the owner of the copyright of the database has the exclusive right to reproduce, translate, adapt, arrange and make alterations to the database and to distribute, communicate and

display it to the public. These rights are in line with general copyright protection, as is the term of protection.

By way of exception, any performance by a lawful user for the purpose of access to the contents and normal use thereof is excluded from the scope of protection. Other exceptions are:

- the reproduction for private purposes of non-electronic databases,
- use for the sole purpose of illustration for teaching or scientific research,
- use for public security reasons and
- other exceptions to copyright authorized under national law.

With the *sui generis* right, the term of protection is shorter. It is limited to 15 years. It can, however, be extended, as any major investment in substantially changing a database results in a new term of protection for that database.

Database makers can prevent extraction - or the transfer of content to another medium - and re-utilization, in other words any form of making the database available to the public by any form of transmission.

Extracting or re-utilizing insubstantial parts of the contents of the database is allowed for any purpose whatsoever. Again, member states can also chose to grant other exceptions to the *sui generis* right, such as extraction for private purposes, for the purposes of illustration for teaching or scientific research, or for reasons of public security.

5.4 Trade Marks

A trade mark is a sign which is capable of being represented graphically and which distinguishes goods and services as coming from a particular business or company. Trademarks serve to indicate the commercial source or origin of the products and services to which they relate.

The many different types of trade mark include word marks, figurative marks and color and shape marks.

According to the definition, trademarks or signs must be distinctive. A lack of distinctive character is therefore an absolute ground for refusal of registration. Trademarks which are descriptive or generic are not capable of fulfilling the origin function.

Other absolute grounds for refusal include signs that are contrary to public policy and the principles of morality.

Relative grounds for refusal exist where the peaceful co-existence of two marks is not possible because of the likelihood of confusion on the part of the consumer.

Routes for registration. Trademarks must be registered in order to obtain trade

mark protection. It is essential to be the first to register.

Registration is possible at national level.

It is also possible to file an international application with WIPO, the World Intellectual Property Organization.

In Europe, applicants have the option of filing with OHIM with a view to obtaining a Community Trade Mark, which affords protection in the whole of the EU.

Scope of protection. Trade mark owners have an exclusive right to prevent others from using their mark in the course of trade.

Trademarks are registered for specific goods and services only. The exclusive right offered by the trade mark is linked to these specific goods and services. This is the principle of specialty.

A second limit is the principle of territoriality. Trade mark protection is limited to the territory where the mark is registered.

Unlike other IP rights, trade marks can be renewed indefinitely. Each renewal adds ten years of protection.

There are a number of different ways in which trade mark protection can end. For example, during the first five years after registration there is no obligation to use the mark. After this initial period, lack of genuine use can lead to cancellation of the mark. Also, a trade mark can still be declared invalid if, after registration, an absolute ground for refusal is identified or where peaceful co-existence on the market is no longer possible.

The scope of protection is broad, but some use by others is allowed, for example for private purposes only

5.5 Designs

A design is the outward appearance of the whole or parts of a product. A product can be any industrial or handicraft item.

Examples of design features include lines, colors and shapes. Examples of the products to which they are applied or in which they are incorporated include packaging and logos.

There are two requirements for protection.

The first is novelty. The design must be new. In other words, no other identical design has been made available to the public.

The second is that the design must have individual character. This requirement is not met if another design which creates the same overall impression on the informed user has already been disclosed.

Some designs are excluded from protection by law because they run counter to

public order and morality.

Registered and unregistered design rights. Design protection has two forms: registered and unregistered. It is possible to register designs at national, international and EU level. The international registration of designs is run by WIPO. Registration for the whole of the EU is done by the OHIM, where applicants can obtain a Registered Community Design.

Protection in the whole of the EU is possible without registration. This takes the form of Unregistered Community Designs. Unregistered Community Designs can be useful for products and designs that have an exceptionally short lifespan, where the registration process might take too long compared with the length of time for which the design is expected to be valuable.

Scope of protection. Design rights are exclusive rights. Their scope of protection is broad and includes designs which do not produce a different overall impression on the informed user. Use of those designs can be prevented.

Design protection is limited to the territory in which the design is registered.

The scope of protection afforded by registered and unregistered designs is different. Unregistered rights protect the design against copying only, and for a limited time period of three years. Registered design rights are stronger. There is no need to prove copying by the infringer. Registered designs offer protection for an initial period of five years, and can be renewed up to four times.

There are some cases in which the right-holder cannot invoke any protection, i.e. where the law states that the use is allowed, for example for private use only.

5.6 Geographical Indications

At international level a definition of what is meant by the term "geographical indication" is provided by the TRIPS Agreement. The Agreement also obliges the member states to take action and provide legal protection against any kind of use of geographical indications which may mislead the public as to the geographical origin of the goods concerned.

Fig. 5.9 –Geographical Indication Marks

At EU level a distinction is made between Protected Geographical Indications (PGIs) and Protected Designations of Origin (PDOs). Various EU regulations allow the registration of geographical terms as PGIs and/or PDOs for wines, spirits and agricultural products and foodstuffs.

Difference between PGIs and PDOs. The conditions to be met by PDOs are much stricter than those for PGIs.

Firstly, there is the difference in the required link between place name and product. In the case of PDOs, the qualities or characteristics of the product must be "essentially or exclusively due to a particular geographical environment with inherent natural and human factors". By contrast, a geographical term can be considered a PGI when the product's quality or reputation is attributable to its geographical origin.

Secondly, protection as a designation of origin is only possible when all the stages from production of the raw materials to preparation of the final product take place in the defined geographical area. For PGIs it is sufficient if just one of those stages is situated in the relevant area.

5.7 Utility Models

Utility models are intellectual property rights that protect technical inventions, just like patents. In contrast to patents, however, utility models are available in some countries - for example Austria, China, Germany and Japan - but not in others - for example Canada, the UK and the USA.

Generally speaking, applications for utility models must be filed in the country where the applicant is seeking protection for their invention.

There is no European or international utility model, nor, apart from in Africa, is there any centralized filing option. In some countries, however, utility models may be filed based on an international PCT application.

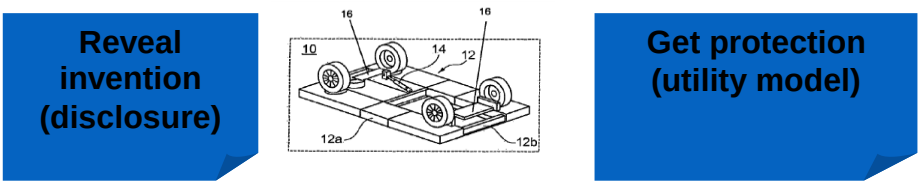


Fig. 5.10 – Utility Models

Depending on the law in the country concerned, utility models offer protection for up to a maximum of 10 years. This contrasts with patents, which offer 20 years of protection.

In most countries, utility models are registered without examination, within a few months of filing the application. They can be either in addition to or an alternative to a patent.

Scope of protection compared with patents. This compares some of the key aspects of utility models with those of patent applications and granted patents. Utility models and patents are both registered territorial rights offering protection for technical inventions. In contrast to patents, utility models are only available in certain countries. Utility models must be filed individually in each country where protection is desired, whereas patent applications may be filed centrally with the EPO or WIPO. Utility models offer protection for 3 to 10 years, while patents offer protection for 20 years.

Utility models are normally registered without a search - a report on the prior art - being carried out. Search reports are standard for patent applications. Exceptions exist, for example in Austria, where search reports are also produced for utility models. Utility models are normally registered and published within a few months, while patent applications are normally published after 18 months. The publication of a patent application is a procedural step prior to examination of the application.

In general, utility models are registered without substantive examination as to novelty, inventiveness or industrial applicability. There are some exceptions - for example Brazil. The result of the examination procedure is either the grant or the refusal of the application. The validity of utility models with respect to novelty and inventive step is only reviewed in revocation or infringement proceedings. Granted patents are the result of an examination procedure.

Patents can still be opposed in later proceedings. The financial advantage of utility models is often mentioned. However, while a single utility model is definitely cheaper than a plurality of patent applications, centrally filing one patent application for many countries is far less complex than filing a plurality of utility models in different countries with different languages.

The biggest advantage of filing a utility model is often the speed with which it is registered.

5.8 Plant Variety Rights

Plant variety rights give the holder the exclusive right to exploit new plant varieties. A plant variety can be protected if it is new, distinct, uniform and stable.

The person who is entitled to the exclusive rights is referred to in the legal texts as the "breeder". The breeder can be the person who bred the variety, or that person's employer.

Plant variety rights are obtained through registration, either at national level in any of the member states of the UPOV Convention, or with the Community Plant Variety Office, which offers EU-wide protection.

Scope of protection. Plant variety rights are awarded for a fixed period of time. In UPOV member states this term of protection cannot be shorter than 20 years. For trees and vines the minimum term is 25 years.

The breeder has exclusive rights relating to the propagating material and the harvested material. "Propagating material" is the reproductive or vegetative propagating material of the variety. "Harvested material" is material obtained through the unauthorized use of propagating material. The breeder must not have had reasonable opportunity to exercise his right in relation to the propagating material.

Certain acts relating to this material require the authorization of the breeder. These are production or reproduction (also known as multiplication), conditioning for the purpose of propagation, offering for sale, selling or other marketing, exporting and importing, and stocking for any of the purposes mentioned above.

The exclusive rights of the breeder are limited in that some acts done for certain purposes do not require his authorization. These include acts done for:

- private and non-commercial purposes
- experimental purposes
- the purpose of breeding other varieties

and the use of farm-saved seeds.

5.9 Semiconductor Topography Rights

Semiconductor integrated circuits (ICs) are embedded in a wide range of electronic devices such as computers, mobile phones and televisions. The size and performance of ICs is determined in part by the layout design.

A semiconductor consists of layers which are composed of semi-conducting material and upon which a pattern is fixed which performs an electronic function. The topography is the design of the pattern. Layout design or topography means the three-dimensional arrangement of the various layers and components and their interconnections.

IC chips are relatively easy to copy. They are protected by the TRIPS Agreement of 1995. Under this agreement, to gain protection layout designs must be:

- original in the sense that they are the result of the creator's own intellectual effort, and
- not commonplace among creators of layout designs and manufacturers of integrated circuits at the time of their creation.

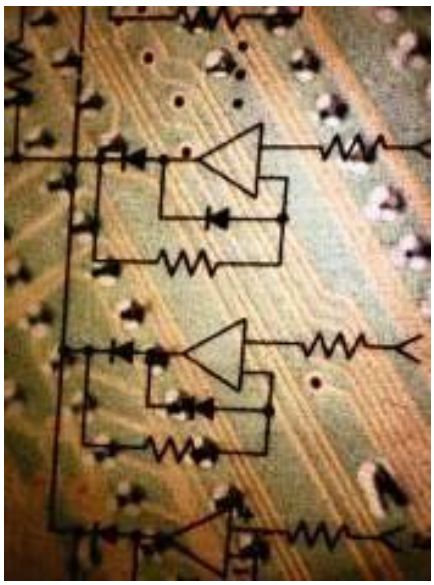


Fig. 5.11 – Semiconductor Integrated Circuits

TRIPS member states may stipulate that:

- layout designs must be registered with the competent national authority;
- information on their electronic function must be disclosed;
- and a registration fee must be paid.

They may also stipulate that the design must have been commercially exploited somewhere in the world.

Scope of protection. Semiconductor topography rights give the owner the exclusive right to exploit a protected layout design - in whole or in part - for commercial purposes. Some countries have special laws concerning this IP right. Other countries offer protection using other laws.

The owner of the topography right can prevent others from reproducing, selling or importing all or part of the protected design or of products incorporating such a design, for example consumer electronics.

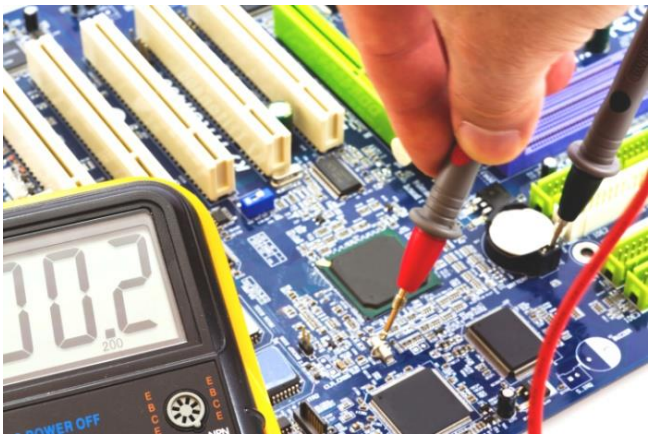


Fig. 5.12 – ICs in Consumer Electronics

The duration of protection is a maximum of 10-15 years from the date of creation of the layout design.

There are a number of exceptions and limitations to this protection.

- No infringement occurs if a protected design is reproduced for private purposes or for the purpose of evaluation, analysis, research or teaching.
- The TRIPS agreement allows reverse engineering by a third party for the purposes of examining the circuit and fostering innovation. The third party may use the information to create a new - original - layout and use the new layout design in their own integrated circuit.
- The right holder may not enforce their rights in the design against another party if that party independently creates an identical design.

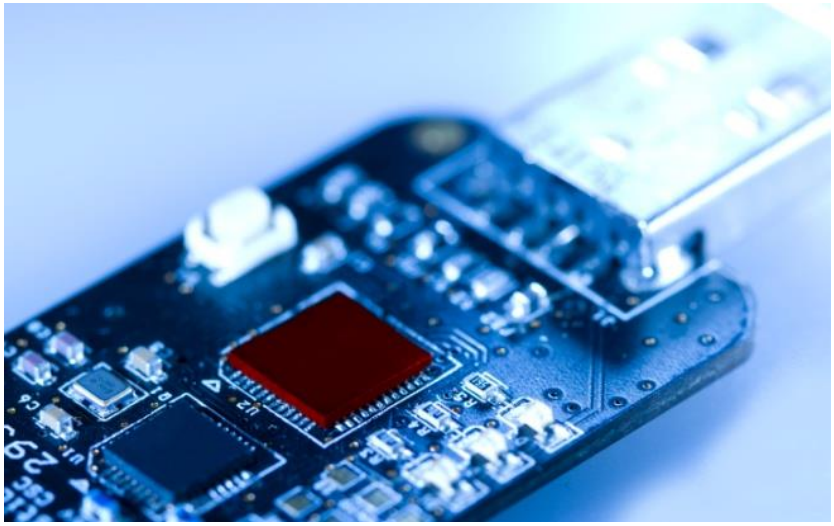


Fig. 5.13 – Semiconductor Topography Rights

An "innocent infringement" due to the importation, sale or other commercial distribution of an integrated circuit that incorporates a protected layout design is not unlawful as long as the person or company doing so was unaware that the design was protected.

5.10 Copyright

Copyright protects any production of the human mind, provided that this production is an expression, and not a mere idea, process or discovery. The expression must be original.

Examples of copyright-protected work in the artistic, literary and scientific fields include literary, dramatic, musical, artistic and photographic works, scientific articles

and computer programs and databases.

Copyright creates a special legal relationship between authors and their work. The author is the physical person who created the work.

The period for which legal protection is conferred is called the "term". International treaties and conventions have laid down a term of a minimum of 50 years after the author's death. This means that the author enjoys copyright protection throughout the whole of his life. In the EU the term is 70 years.

Scope of protection. Copyright confers both economic and moral rights on the owner. The economic exploitation rights include the rights of reproduction, communication to the public, translation, adaptation, distribution and resale.

The moral rights include the rights of authorship, integrity and divulgation.

These rights are limited in that third parties are allowed to use the protected work in certain situations and for certain purposes. These exceptions and limitations are in the public interest.

Copyright infringement occurs if the protected work is used without the consent of the author or right-holder.

5.11 Trade Secrets

To become a trade secret, information must not be generally known or easily discoverable. At the same time, it must have a business, commercial or economic value from the fact that it is secret. It must also be possible to demonstrate that reasonable efforts have been or are being made to maintain the secrecy of the information.

Trade secrets are valid for as long as they remain secret, in other words for as long as they do not fall into the public domain.

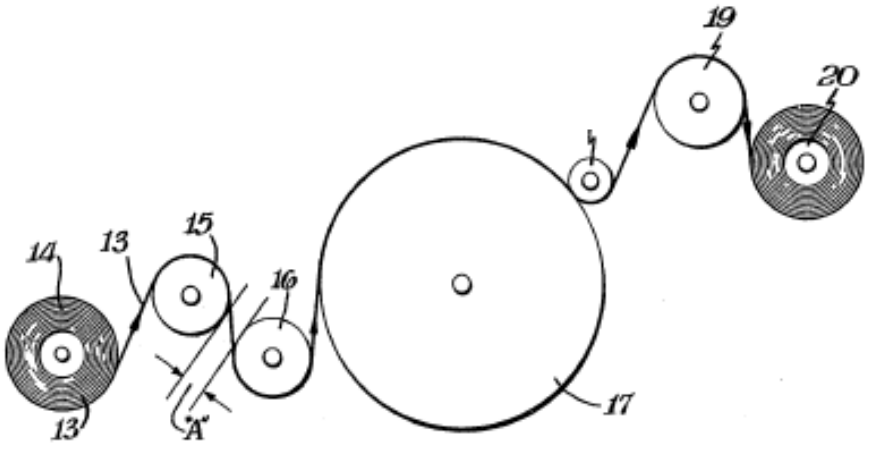


Fig. 5.14 – Trade Secrets

Scope of protection. Trade secrets can be just about anything that can be kept secret and that confers a commercial advantage.

One example of a trade secret is the formula for Coca-Cola, which is kept locked away in a vault at the Coca-Cola headquarters.

Chemical or other manufacturing processes can also be valuable. The diagram on the left is taken from the original GORE-TEX patent. Another company had kept a similar process secret for several years before Gore filed their patent.

Means of protection. The protection of trade secrets involves both practical arrangements to restrict access to knowledge, and legal or contractual arrangements to ensure that those who have access to the secret or confidential information do not divulge it.

In many countries, employment agreements can include a restriction stipulating that key employees may not go and work for a competitor, and most employees have a so-called "fiduciary" duty to their former employers to not reveal confidential information.

Non-disclosure agreements help keep information exchanged with customers or potential partners confidential. They are only effective if the other side keeps the information secret.

A better way to protect information is to restrict access to those employees with a need to know the information. More generally, data can be encrypted (in particular if it is sent over the internet) and entry into certain areas of a manufacturing plant controlled.

5.12 Intellectual Property in the Real World

Divide yourselves up into groups of 4 to 5 people and read the exercise you have been given.

The exercise is about a new medicinal product which has been developed by a university research team. The product is very effective in treating certain allergies. The team has also designed a nebuliser with a special nozzle design for nasal application that permits more effective delivery, and an improved pumping system which delivers a fixed, precise dose of the product.

Fig. 5.15 – Today Inventor

In collaboration with an engineering company from the university's technology park, they have also developed an attractive design for the sprayer can.

Together with an advertising agency they have come up with a brand name, NEBU-ALLERG, an attractive logo and a slogan which reads "Press green for go!" The agency also plans to design a website and other material to support the promotional campaign.

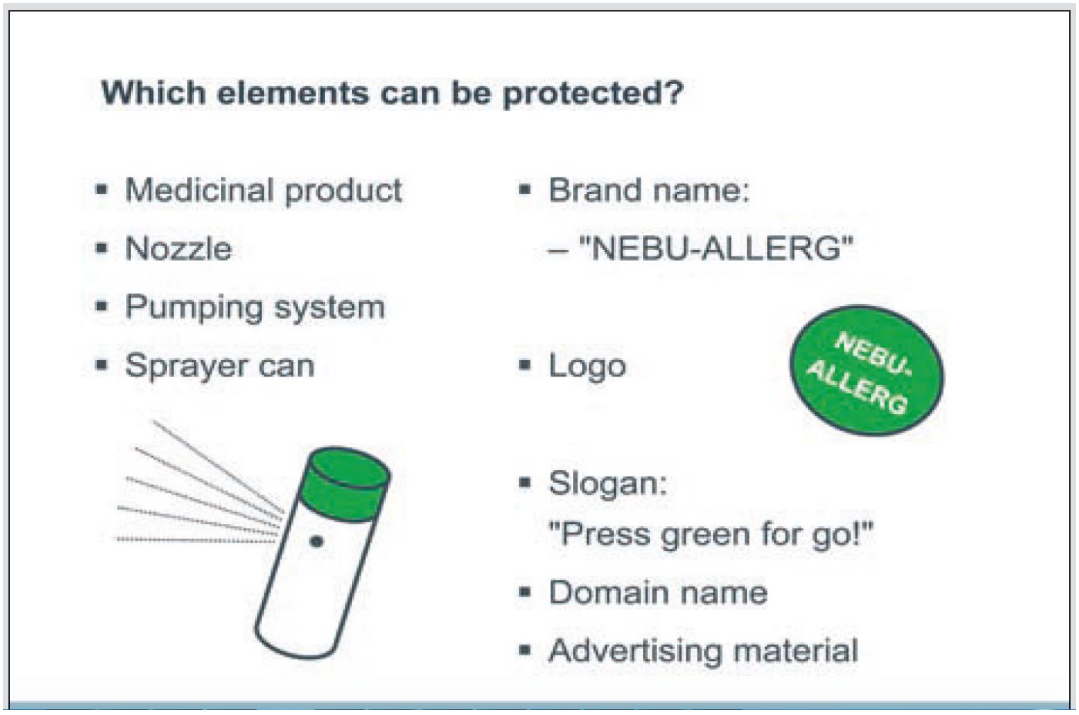


Fig. 5.16 – Elements can be Protected

The current stage actualizes the following questions:

- Identify the various IP elements in this project,
- Suggest ways in which they can be protected, and
- Identify the potential contractual issues that might arise.

Patents and designs (I)

First of all, how would you protect the medicinal product?

What about the process for making X?

And the formulation?

What about a method of using the spray to treat allergies?

Patents and designs (II)

What about the nozzle?

And the pumping system?

And the sprayer can?

And last but not least: who owns all this IP

Trademarks, copyright and domain names

What about the brand name, logo and slogan? Registered trademarks can be obtained for them.

As far as the advertising materials are concerned, the text and artwork for posters, flyers, jingles, TV and radio advertisements and websites are all covered by copyright.

But be careful: who owns this IP? The advertising agency. So you must try and get these rights transferred.

What about confidentiality agreements with the agency? This is a good idea, as it will guard against leaks of commercially sensitive information such as pricing, marketing strategy, launch dates, technical data and so on.

With regard to the domain name, if NEBU-ALLERG becomes a registered trade mark, this will afford strong protection against cyber-squatters who might register "www.nebuallerg.com" - without a hyphen - or "www.nebu-allerg.eu" and other variations.

As customers are quite likely to ask their pharmacist for "that allergy medicine with the green button", it would be a good idea to register "www.thegreenbutton.com" as well.

What next?

You need to check that you haven't re-invented technology that already exists and that you are not using a brand name that has already been registered as a trade mark.

You can check this by doing what we call a search.

You can perform an initial online search yourself, for example in Espacenet or TM view, both of which are free to use.

But you should also seek professional advice for answers to the key questions shown here.

Section 6

THE CONCEPT OF INNOVATION PROJECT. PREPARATION OF THE INVESTMENT PROPOSALS

6.1 Concept of Innovation Project and Investment Project Cycle

In the international practice, the enterprise development plan is presented in the form of business plan that is essentially the profile of development project of innovation enterprise. If a project is connected to the investment attraction, it is called an "investment project". Usually, every new project of an enterprise is more or less connected to new investment attraction. More generally, *project* – is the special drafted proposal for changes in the enterprise activities for a specific purpose.

We are going to define *project* as a unique plurality of interconnected activities with the agreed start date and determined objectives (tasks), which accomplishing means the project completion. In addition, the budget, the resources required and the result quality are defined.

Projects are usually separated into tactical and strategic. The latter includes the projects, which imply the change of property category (establishment of subsidiary production unit, joint-stock partnership, private enterprise, joint venture, etc.) or radical change in the production nature (release of new production, transition to a fully automated production, etc.). Tactical projects are usually connected with the changes of production volume by increasing the product quality and equipment modernization.

The general procedure of innovation management of enterprise for a specific project is formalized as the project cycle that has the following stages.

1. ***Project formulation*** (sometimes the term "identification" is used). At this stage, the upper executive management of enterprise analyzes the enterprise current situation and identifies the most desirable areas for its further development. The result of this analysis is defined (implemented) as business idea, which addresses solving of the most important tasks for the company. At this stage, you should have

the convincing reasoning concerning the degree of idea implementation. Several ideas for further development of the company may occur. If all of them are equally useful and feasible, then several investment projects are developed in parallel to select the most appropriate at the final stages.

2. *Project development (preparation).* As soon as business idea passed the first inspection, it should be developed to the moment of firm decision – positive or negative. At this stage, gradual specification and improvement of the project plan are required in all its areas – commercial, technical, financial, economic, institutional, etc. It is extremely important at this stage to find and collect preliminary information to solve specific problems of the project. It should be noted, that success of the project implementation depends on the degree of source data credibility and the correct interpretation of the data appearing during the project analysis.

3. *Project expertise.* The necessary stage of the project life cycle before its implementation is qualified expertise. If the project is financed mainly at the strategic investor's cost (credit or direct), the investor conducts an examination, for example with the help of the consulting firm, preferring to spend some amount on project preparation rather than waste most of money during the project implementation. If the enterprise plans to implement the project at the expense of its own funds, the project examination is also required for conformance inspection of the project main principles.

4. Project implementation. The stage covers the real development of a business-idea to the moment when the project is fully set in operation. It includes monitoring and analysis of all activities as they proceeds and control from regulatory authorities within the country and / or foreign or domestic investor. This stage also includes the basic part of the project implementation. It aims to check the sufficiency of funds generated by the project to cover the investments and provide the investors with the desirable returns.

5. Results assessment. It conducts both at the project completion and during its implementation. The main goal of its activity is to obtain the real feedback between the ideas put into the project and extent of their actual performance. The results of such comparison provide the necessary experience, which can be used during the development and implementation of other projects.

Below is the stage of the project development when a business idea of the project is already formulated. During the project examination, it is advisable to apply the presented material because the examination essence is the verification of content correctness of the investment project.

One way to attract investor is to create joint venture in the form of a joint stock company with the participation of Ukrainian party (recipient) and foreign partner (investor). In this case, the initiative usually comes from a recipient who tries to

interest potential investors. The success of the investment project will greatly depend on the extent of satisfaction of the foreign investor. In this case, an investment proposal (or investment memorandum) can be considered at first, and then the development of the investment project can be conducted. This document includes the recipient information, the results of its activities in the past, product range, strategy and tactics of market behavior. Once approved by a potential investor, the investment project is thoroughly developed following the comments and suggestions of the investor. Such scheme of work organization provides the optimization of the recipient efforts.

6.2 Types of Investment Projects

The project analysis practice allows to summarize the experience of projects development and recalculate typical projects. The main types of investment projects occurring in foreign practice are listed below.

1. Replacement of outdated equipment as a natural process of existing business continuation on a permanent scale. Typically, such projects do not require long-term and complex procedures of justification and decision-making. Multialternative can occur when several types of such equipment exist and there is a need to justify the benefits of one.

2. Replacement of equipment in order to reduce the current operating expenses. The purpose of these projects – the use of newer equipment instead of less efficient or morally obsolete equipment. This project type has detailed profitability analysis of each proposal, because more technologically advanced equipment is not definitely more profitable from a financial point of view.

3. Increase of product release and/ or expansion of service market. Top management of the enterprise usually takes this project type. It is necessary to analyze in details the commercial project implementation with justification of the market niche expansion and the financial productivity of the project while clarifying the correlation of sales volume to certain profit markup.

6.3 Preparation of Investment Proposal (Business Plan)

It is recommended to prepare the materials justifying the project investments in the form of a project business plan (business folder), which provides the investor with the opportunity of project integrated assessment and shows the profitability and

reliability of the project investment.

Business plan is developed and adjusted in three stages. The first – the previous version for assessment and selection of projects for further development (business folder); the second – the final version of the selected projects; the third stage – the periodic adjustment of business plan.

When developing a fully integrated business plan of the enterprise development, the following procedure is recommended:

1. business plans of subsidiary production units;

2. detailed study of specific business projects;

3. business programs of activity areas (marketing, production, finance, transport, research-and-development activities, etc.)

4. integrated business plan of development

Content and recommendations for business plan preparation are listed below. Consider the development stages of project business plan.

1. Holding a daily briefing on determination of project goals and tasks with participation of all concerned: project initiators, implementing organization, investors and business plan developers.

Duration - 3-5 hours.

Result:

- formation of overall vision of project situation, project goals and implementation results;
- adjustment of business folder (short data on investment project);
- specification of detailed scheme of business plan formation and determination of meeting appointments with the key stakeholders.

2. Internal meeting of the business plan developers (3-5 people) on resources inspection and determination of responsible.

Duration - 15-20 hours.

Result:

- presented materials being structured in advance;
- defined “blind spots” of the project ;
- contemplated measures for “blind spots” elimination;
- determined responsible;
- detailed work schedule.

3. Meetings with the organization experts (responsible for specific areas of work - 3-5) for clarification of the presented materials.

Duration - 1-3 hours for each expert.

Result:

- additional information on “blind spots”.

3*. Conducting of marketing research (in coordination).

Duration ~ 2-3 weeks.

4. Individual work of business plan developers on the structuring and additions sections.

Duration - 30-50 hours.

Result:

- detailed business plan sections;
- developers understand strengths and weaknesses of the project;
- the need to involve experts is defined.

5. Preparation of variants calculations by the main sections of business plan of investment project.

Duration - 15-20 hours.

Result:

- alternative options of project development are studied;
- assessment of influence of different factors on its productivity;

6. Organization of expert group work on project implementation productivity and reliability of the presented materials.

Duration - 5-10 hours.

Result:

- expert opinion on the project;
- determination of its priorities.

7. Cooperation of coordinator with the developers on the main sections approval and complete business plan structuring.

Duration - 20-30 hours.

Result:

- original structure of business plan.

8. Obtained data reconciliation with the experts of the implementing organization and investor on the business plan sections. Collection of project comments.

Duration - 5-10 hours.

Result:

- familiarization of organization experts with primary documentation;
- formed package of proposals on business plan amendment and specification.

9. Amendment with consideration of comments, project revision.

Duration - 10-15 hours.

Result:

- consideration of amendments and specifications proposed by experts

10. Presentation of the full text and holding a briefing with all the stakeholders: the project initiators, representatives of the implementing organization, investors and business plan developers.

Duration - 2-5 hours.

Result:

- business plan presentation;
- formation of common situation vision of the stakeholders;
- taking business plan as a guideline to drive the process.

11. Preparation and completion of the final text.

Duration - 5-10 hours.

Result:

- introduction of final primary document;
- conduction of work on the business plan formation;
- start of project implementation (or its rejection).

Consider in more detail the development process of the project financial plan.

Stage 1. The developer of the business plan financial section (one expert) together with the organization specialists (managers, financiers, accountants, marketing experts, technologists and fabrication staff) at joint meeting form the first financial and economic indicators of the project proposed for the development.

Stage 2. The developer customizes the program complex for the solution of a specific task – the financial plan development of real business project (with consideration of source data availability).

Stage 3. The information on financial and economic issues (project investments and sources of their funding, sales revenue, price and cost value and standard deduction required) obtained at the first stage is added by an expert to the **customized program complex.** At the output, the expert obtains completed financial plan of project development (with corresponding base indicators – accumulated profits, accumulated profits with regard to discounting, domestic interest rate and payback time.

Stage 4. After receiving the previous version of financial project development plan at the third stage, the developer holds the experts meeting where represents the base financial and economic indicators of the project. In case the completed version do not suit the organization, the stage 5 follows, if it has potential for the enterprise – stage 6.

Stage 5. The experts conduct the search of supplementary reserves of project payoff improvement (sales increasing, price rise, cost value cut and investment costs cut) with the calculation of eventual financial and economic project outcome. If there is no acceptable version, the question to decline the project is raised.

Stage 6. During the project meeting, the various alternative scenarios of investment project development are assumed, especially in terms of their impact on financial results (sell price drop, cost value increase, production volume decrease, inventory increase, etc.).

Stage 7. The developer calculates the versions of investment project development

described at 6th stage for its financial productivity (at customized program complex).

Stage 8. After the calculation of main financial plan of investment project and possible alternative scenarios of its development, the expert registers the obtained data in the framework of financial section of the business plan.

Stage 9. The business plan developers (including financial, organization, technological, marketing, risk assessment plans) and future participants of its development agree the completed business plan of investment project and outline steps for its implementation.

The flexibility of planning is achieved by introduction of resources, multiple-option plans development and amends based on actual events. Plan cannot prevail over the decision. The plan implementation is conducted in order to serve the most important purposes of enterprise.

The experience of consultation exercise with enterprises indicates that even with available standard documents on business plan completion, the experts of enterprise investment departments often cannot organize the work on business plan development and fail in the attempts to use the services of specialized firms. Only those projects are implemented which are developed jointly by managers and experts, who not only take decisions but also execute them.

It is necessary to take into account that workers of economic services (including economic planning department) can improve the planning process. Although they are not able to carry out strategic planning of activities on their own (comprehensive look at the company development), since this is managers' function who are personally responsible for work productivity to consumer (and optionally to the parent organization).

The major categories of analytical information should be included in the investment proposal. The specific requirements for financial disclosure and limitations imposed by legislation of Ukraine should also be identified.

1. Summary. Summary – a brief description of investment proposal – is the most important part. It aims to attract a potential investor, so he/she will be interested to know more about your company. Should be noted, that potential investors usually have limited time to explore new investment opportunities that is why summary can be a key in decision taking.

Summary should concisely describe all key elements of the investment proposals and contain the answers to these key questions of potential investors: What is the possibility of obtaining profit on investments? Is there a potential for growth and needs of the market? What market share can your company occupy, what are the competitive strengths and how do we implement them to achieve the desired goals? What are the skills of your team, and what is your working experience in the field? What are the funding requirements, conditions for capital attraction and exit strategy

of investment?

On few pages, you should briefly and convincingly prove to your potential investor that your company is competitive and has substantial potential for development. Your strategy and competitive strengths are able to provide strong market positions in the future and the required assets will be used appropriately and make profit for the investors.

Thus, the basic information presented in summary consists of: brief description of your company, products and markets of your current work, brief description of team and financial results of the company activities for the last 2-3 years; brief description of your company's future, strategy development, investment projects, growth opportunities, risks and financial projections for 3-5 years; brief description of the funding requirements including the amount, terms, proposed capital structure and tendency of its use.

2. Company history and property. Considering the future state of your company, a potential investor must assess the way business functioned before. The chronological history of the company should be prepared beginning from its foundation to the present moment. Identify the major events occurring in the company: organizational and legal changes (e.g. privatization, merger, acquisition, restructurisation, etc.); key events connected with new product release and market success; financial events (attraction of assets by issuing stocks, obtaining of government assistance, etc.). If the business prehistory is not a significant indicator for predicting the future state (e.g. significant changes in activities, products, management, etc. are planned), this should be mentioned. If the company used to be a success in the past and plans to ensure development through business expansion, new products release, out-reach to new customers based on the previous experience, this should be clearly demonstrated in the investment proposal.

3. Products and /or services. The products and /or services, which your company offers in the market now and plans to offer in the future, should be described in details. You need to explain to potential investors what your business is today and how your products and /or services are required in the market. This section contains the following information:

Description of existing products and/ or services (their key features) and description of marketing as a system of promotion and distribution of products and/ or services. Specify the main competitive strengths (higher consumptive qualities, low prices, terms of delivery, etc.) of your products and/or services, providing the success in the market. Investor should understand the basis of the future success of your company. If you are the developer of your products and/or services, describe the process.

The size of the section depends on the amount and complexity of products and/or

services of the company. Note, that a potential investor may not have expert knowledge in the field you are applying. Try not to use too complicated terms, make the text more simple and understandable.

Use the tables and charts that clearly demonstrate the advantages of your products and/or services. Try to give full and brief description of the products and/or services in the context of investment proposal, and provide more detailed (engineering) information in the annex to the main document. In this case, a potential investor will know that the detailed engineering information can be obtained if required. Considering that such information may be confidential, it can be presented not at the stage of initial familiarization with the project but during the next stages of the interaction process when the investor shows commitment to your project.

4. **Management and staff.** The vast majority of potential investors are sure that the key of the company success is the qualified team. If the possibility of investing in the developing business is considered, then its success will depend on the qualities and productivity of the operations carried out. At the same time, when investing in real property the most important criteria is the location.

Investors do not just buy business with high potential of development, they invest in the team, which will manage this business. Potential investors should be confident in the ability of the company to implement planned actions with the maximum productivity.

This section provides the following information:

Summary of the working experience, competence and qualification level of the key managers of your company (with short autobiographies, full CVs included in the annex). Description of weaknesses of the management team with the offers to improve disadvantages. Sometimes investors (e.g. strategic) apart from funding contribute to improvement of management efficiency. Organizational and structure chart of the company is presented showing the main functions and responsibilities of the key managers and employees.

The investment offer should also include the information on key employees of the enterprise. The company success in the market depends on their skill level. The information on scientific, technical and engineering staff, designers, highly skilled (unique) workers, etc. is provided. The need in workers and managers for your business is noted. Information may include quantity of employees, terms of remuneration, extra compensation, distribution of workers by functional areas, availability of labor union, history of relations between the administration and workers (detailed information should be provided in the annex). It is advisable to introduce the program of managers retraining and employee training and education.

5. Economic sector, market and competition. After a potential investor reviews the investment offer, he\she will better understand the field of your company

activities, distribution areas and the level of competition. This is the key information based on which a potential investor can decide whether your company can successfully implement its competitive strengths in the market in correspondence to the business plan. In other words, to ensure profit and increase in business value.

Economic sector. When talking about the economic sector of the company activities, it is necessary to pay attention to its trends and ways of their impact on the company. When describing the economic sector, such indicators should be noted:

- impact on terms of delivery;
- buying terms of products and/or services;
- potential substitute products;
- barriers during the entrance of the major opponent companies to the market where the company operates;
- level of competition in the economic sector.

Market. Describe the target markets, segments and target groups of customers, where specifically the company is going to sell its products and/or services. Description should include clear definition of markets or market segments (including demographic, geographic, and functional, etc.) with the specification of trends and indicators defining the change in demand in these markets and segments. Such approach should consist of:

Definition of the key customer groups (including the customers of industrial articles, articles of consumption, government offices, etc.) with the specification of their basic features. Description of the existing and future growth of market and market segments. Definition of the existing markets (regional, national and international) and future markets (due to the possibilities of future growth). Description of products dissemination means from the target segments. Description of the special and other features of the target customers and areas defining the highest opportunities for growth (including the impact of suppliers, barriers during the entrance to the market, seasonality, cyclical nature, currency fluctuations, etc.).

Competition. A potential investor takes negatively the company, which does not show the realistic view on the competition. The information provided in this section helps a potential investor to make conclusions about the possible success of the company in the market.

This section should contain the following information:

Who are your competitors? What are their strengths, weaknesses and their market share? What is the basis of the competition (key factors of the market success: pricing policy, products quality, reliability, customer service quality, mode of behavior, public image, system of products promotion, etc.)?

A potential investor will understand the assessment of your position in the market or market segments. After you define your target customer groups, you must describe

your reaction to the emergence of competitors in the market. Investors are willing to understand how your strategy and implementation of the marketing plan will succeed in dealing with competitors. The given information should provide a potential investor with answers to the following questions:

What market share will your company occupy through a period determined by your marketing plan (business plan)? Will your strategy implementation result to the creation of new markets? Will your company's clients be attracted because of total market capacity growth or will they be drawn away from the competitors (mention them)? How will your client react to your expansion or entrance to the market or market segment? How will they respond to your actions? Can your actions result to new competitors appearing? How will you respond to their appearance?

Try to make your predictions realistic. It is easy to overestimate the strengths of your company and underestimate the competitors' capabilities. The lack of realism will be assessed by a potential investor as your incompetence. This can also form an assumption about the other parts of your investment proposal that are also optimistic, especially if an investor is experienced in the field.

When you describe economic sector, markets and competitors data (historical and predictive), try to use information sources: reports of independent consultancy firms on market research, published industry forecasts, state statistical information and other publications. It will help to make your data more reliable, credible and to convince a potential investor that your estimates are realistic.

6. Operations. The section should include the information on your business functioning. What and how does your enterprise work, how does it sell and deliver its products to the clients? Description should contain the further information:

for industrial projects: description of company operating process, the main process operations and business processes, possibilities of quality improvement and capacity extension:

- distribution system;
- process of patenting and licensing;
- technology level of production;
- types of equipment;
- production capacity;
- key suppliers of raw materials, supplies and parts;
- qualification requirements for workers;
- owned or leased premises and tracts of land;
- key advantages;
- technological limits (including capacity limits) and how these limitations can be eliminated.

for business connected with providing services:

- means of providing services to clients;
- requirements for staff retraining;
- factors limiting the ability to provide services.

Additional, detailed information can be presented in the Annex, e.g. planning of production centers, photographs, raw materials features, etc.

7. Financial history. This section includes the company financial results for the previous period: balance sheet, income statement and cash flows statement. This information is necessary for a potential investor to assess the effectiveness of its work. Investors will use the reports to analyze the realistic forecasts of financial results.

It is advisable to give brief commentaries explaining which events influenced the financial results. The commentary should explain changes in sales volume, gross profit, operational profit, working capital debt obligations etc. Thus, an investor will be given information about possible prospects based on the results. This allows an investor to understand the volume of company financial operations. You should also explain all possible significant inconsistencies between past financial results and their future values specified in the strategic plan.

Complete financial and audit reports can be presented in the annex.

8. Strategic plan. Strategic plan is the most important part of investment proposals for investors. It allows an investor to understand how the company plans to capitalize its growth opportunities. Include in this section the following information:

Description of the strategic plan of the company development, growth opportunities and means of their implementation. Description of specific actions to be implemented during the execution of the strategic plan. Description of the expected effect of these actions and their impact on marketing and sales, expenses, funding, human resources and production functions.

This information can be presented in various forms. For example, in the form of the general description of actions indicating the effect for each functional area or a table containing specific objectives for each functional area and the description how these objectives can be achieved and what resources will be required for plans implementation. The plan should agree with the rest of the investment offer.

9. Risk factors and risk reduction strategy. In this section, you should describe risks, which can occur in the company during the project implementation: commercial, political, social, natural, criminal, etc.

The strategy of risks reduction should also be mentioned. It is necessary to show potential investors that you are realists and assume the possibility of these or other risks. However, assuming the potential risks, you should consider the specific measures to prevent them or reduce the level of possible loss from their occurrence.

10. Financial projections. This section describes the forecasts of financial

condition of enterprise for the future. Forecasts are made with the consideration of the fact that the Strategic plan of the company will be successfully implemented. Potential investors will evaluate the profit on project investments based on the submitted financial calculations and confidence that the company will actually achieve the desired purposes. Usually, this section contains the following information:

Full set of forward financial statements (balance sheet, income statement and cash flows statement) for the next five years (at least two years in increments of 1 month, and the next – by years) and the implementation results demonstrating the strategic plan. Description of all main source data and assumptions used for financial forecasts calculations that affect:

- increase in sales and market share;
- products and services prices;
- investment costs (front end costs, investments, etc.);
- operating expenses (production, marketing, administrative);
- taxes and fees;
- exchange rates and inflation forecast;
- all other expenditures as a result of the strategic plan implementation;
- forecast of financial ratios and discounted cash flows.

In addition the capital demand forecast should be given.

Financial forecasts should be realistic. However, keep in mind that they may cause the skeptical reaction of potential investors. Any significant deviation of financial proposals from the industry-average indicators should be justified. Detailed calculations can be presented to investors at a later stage.

It is also important to show potential investors the results of the project sensitivity analysis. In case of independent consultants and/or auditors involvement, it should be reflected them in this section.

11. Financing requirement. In this section, the financing requirement of the company is described in details. This is done by calculating the cash flow forecast and defining the deficit in different periods. It is necessary to determine the best capital structure (loan / stock), based on the following provisions:

- availability of funding sources and availability of necessary support; terms of capital procurement;
- maximization of stock capital profitability (ensuring of investor appeal); ensuring of creditworthiness acceptable to the credit and financial relations (correlation of total liabilities and stock capital);
- ensuring of funding flexibility; exit strategy of project for investors.

Define the total requirement of capital and its usage: expenditures of preparatory period; investments and working capital.

12. Government assistance and legislation. Government actions have impact on company development process. That is why it is important to define whether your project uses the assistance of regional level. The active legislation that can influence the project implementation results should also be described. This section should contain the following information:

How the project fits into the general economic or investment strategy of the state. Possible mechanisms and means for the support of your project at regional level. Project contribution to the economic growth of the region (budget, social, operational, ecological and other effects). Features of the legislation governing the activities of your company. Limitations of currency exchangeability, terms of import and export of capital.

References to important legal acts that will determine the success of your project may be submitted in the form of annex.

13. Financial proposal. There are different opinions on whether it is sensible to provide information on business valuation to potential investors or it is better to do that during the negotiations at the last stage. By the time you provide the financial proposal, it is desirable for investors to discuss it with professional investment advisor. The investors can attribute your financial structure to the category of attractive investment opportunities. It can determine the final price and have significant tax consequences. However, it may cause a negative reaction of investors if they find the assessment overestimated.

By including the range of estimates in the Investment proposal, you may quickly eliminate those investors who do not share your thoughts on business valuation. It will save time for both: you and potential investors.

At the same time, if you offer the range of estimates far exceeding the expectations of potential investors, you can push them away. Thus, the range of estimates, despite the certain advantages, may weaken your position during negotiations with investors.

In any case, when defining the valuation of your business and agreement structure, you should be realistic.

Your estimates should be emphasized on the future profit of the company. The most common method used in business valuation – discount cash flow approach. To conduct evaluation using this method, develop a detailed financial model of the company and make the relevant calculations.

14. Annexes. Additional data should be presented in the form of annexes to the main text of Investment proposal. Annexes may include such documents: financial statements; audit reports; experts conclusions on property assessment; company promotional brochures; detailed (operational) description of products and / or services; CVs of key administrators; major agreements and contracts; information on

the production process; investment project; market inquiry reports; extracts from the most important legal acts and other documents.

Annexes usage if needed provides an opportunity to make the main document comprehensive.

Using of such holistic approach gives a chance for better understanding of their own business.

6.4 Miscalculations and Common Errors in the Business Proposals Preparation

In this section, distinguish the factors, which may lead to errors and significantly affect the project assessment and the business plan development in the whole.

There are two main reasons why you need to consider your business plan through the prism of mistakes:

• do not make similar;

• know "bottleneck" of your documents.

The main reasons of miscalculations. It is necessary to distinguish the internal and external reasons of miscalculations. Since the implementation of any project is connected with uncertainty (external reasons), it is possible that we ignore it (internal reasons). We will not discuss intentional errors caused by the desire of the company to increase the investor appeal of their project (not to mention dishonest partner).

The main reason of internal miscalculations is personal opinion that "we are all aware of this project (or products or technology)." This leads to excessive optimism of the project developers, resulting in:

• optimistic terms of the project development;

• exaggerated sales volume;

• understating of cost value;

• underestimation of the funding amount required.

The most important in this case is the idea that the products will be sold easily after the release. In other words, sometimes it is not enough to know the real market.

Other internal reason is not taking into account the wishes of the target group of business plan. Investors or partners will look with favor on your project if in the business you specify plan (explicitly or implicitly) those aspects and possible factors to which they would like to get answers.

Many uncertainties (external) could be removed, if they are worked at enough. This requires:

• time;

• money.

Duration of business plan elaboration on the project with investment volumes to 10 mln US dollars can reach 6 months. The project developer usually wants to obtain the result quicker.

Deep elaboration of the matters requires researches and specialists involvement. It can increase the budget allocated to business plan preparation.

Significant factors leading to errors. Almost all factors should be analyzed in details, since they are potential threat to the project implementation. Due to the lack of relevant data, accurate information, money and time for clarification, business plan contains the tentative or expert data. Using common factors, you can define either a superficial description with no particularities or a thick one when an investor loses details.

Errors in market assessment

Incorrect assessment of the market - it is the "weakest" spot of business plans, including:

market assessment by product, goods and services:

- market segment,
- consumers interests,
- potential demand,
- effective demand
- prices,
- market share (sales volume);
- competitors:
- behavior strategy,
- product price and quality,
- import potential,
- import potential in perspective due to changes in exchange rates.

Errors in goods

product description:

- advantages of the product over others are not shown,
- what the customers are looking for, what they want to buy,
- why the customers are interested in this product;

product promotion:

- product promotion,
- advertisement,
- communication with consumer,
- delivery.

There is no need to invest in morally obsolete product or technology. For this,

you should correctly consider the product life cycle, its current state, time of "expiration" including world trends, technical innovations, technological and production "leaps".

Errors in production

Engineering level in Ukraine is rather high and the errors in production and technological part occur very rarely, though the project needs to be bounded with technologies and equipment. Particular attention should be paid to "bottlenecks" and means of their fixing.

Errors in staff

Project implementation is not possible without the administration. Some methods of business plan development dedicate a third of its volume to project manager, his team and consultants. It may be considered that investment logic here is – "for a person". Serious projects are not developed separately, they need a cohesive core. American specialist John Shook thinks that lack of team is a business killer №1. The business plan section connected with staff is underestimated while thinking that there are many good managers. During the project implementation together with partners, especially foreign ones, it is necessary to record the segregation of duties and results clearly and in documentary form. Even the documents may not help when they are revised from the points of view of different cultures, so various proposals being meant:

- possible change of orientation, strategy and tactics of company administration;
- there are different interests initiating managers and executives;

In many cases during the new production creation a group of new people is needed. Is there a possibility of qualified specialists' involvement? Will the salary meet their demands?

Errors in organizational structure

Is the adequate contact of organization with the outer world provided? Is the structure management to solve the operative tasks / long-term tasks provided? Are the information exchange between the subdivisions and work for common purpose provided?

Errors in finances

Financial part of business plan has numbers, which can be manipulated. You should especially pay attention to the definition errors of market volume, market share and hence the volume of sales and prices; accounting of inflation – structural changes in prices and costs:

- on products,
- materials, raw materials and components,
- energy, fuel,
- salary changes,

- the costs of equipment, construction, repair,
- revaluation of assets leading to a change in depreciation;
- changes in exchange rates:
- constant exchange rate,
- exchange rate changing proportional to the price,
- exchange rate lagged from inflation,
- other assumptions.

The lack of inflation accounting through calculations in constant currency does not show the lack of working capital. In addition, such important budget item as the formation, distribution and financing of working capital is absent.

Are all taxes (VAT, income tax, others determined by revenue or sales) taken into account? Are export and import taxes examined?

Business plan developers can also not to take into account all expenditures (direct expenditures, unforeseen expenditures, insurance expenditures, advertising costs, etc.). Are the discounts for customers and commissions taken into account?

Money withdrawal on side can cause failure for the project implementation and payoff. Means of control are fixing of budgets, project budgeting and phased implementation of the project.

Is the financing scheme developed? Who will be the financing partners, which will be their roles and rights?

Limitations.

The existing restraints are often not thoroughly examined in the business plan:

- legal;
- patent;
- accountant's;
- fiscal;
- qualification;
- organizational capability;
- relations with the authorities, tax administration, custom office, etc.

Not every project turns out to be successful. The combination of projects with regard to their "reserve power" should be successful.

The company IBM boardroom believes that they do not develop good projects. Projects become good during their implementation.

6.5 Investment Risks Assessment

Investment activity in all its forms and types is connected with the risk, the degree of which increases with the transition to exchange relations in the economy. Increasing of risk under current conditions is connected with increasing of uncertainty and rapid variability of economic situation in the country and the investment market in particular; with expanding offer for objects investment; with the emergence of new issuers and financial instruments of investment.

We consider an investment risk as the possibility of unforeseen financial expenditures occurring (decline in earnings, loss of capital, etc.) in the situation of uncertain terms of investing activities.

There are various types of risks. They can be classified by the following main features:

1. By field of display the following types of risks are distinguished:

a) *economic*. It includes risk associated with changes of economic factors. Investing activity is carried out in the economic sphere, that is why it is most exposed to economic risks;

b) *political*. It includes various types of arising administrative constraints of investing activities related to changes in government policy;

c) *social*. It includes risk of strikes, failure of planned social programs and other similar types of risks;

d) *ecological*. It includes risk of different environmental disasters (earthquakes, fire hazards, etc.), which affects the investment objects activity;

e) *other*. These include racketeering, embezzlement, deceit from investment or business partners, etc.

2. By forms of investment, the following types of risks are distinguished:

a) *real investment.* This risk is connected with unsuccessful choice of object placement; interruption in deliveries of construction materials and equipment; significant increase of prices on investment goods; choice of unqualified or unscrupulous contractor and other factors that delay putting the investment object into operation or those that reduce profit during its application;

б) *financial investment.* This risk is connected with ill-considered selection of financial instruments of investment: financial problems or insolvency of individual issuers; unforeseen changes in investment conditions, direct deception of investors, etc.

3. Two main types of risks are distinguished by sources of emergence:

a) *systematic (or market).* This type of risk appears for all the participants of

investing activities and investment forms. It is defined by the economic cycle stage changing of country's development or business environmental cycles of investment market development; significant changes in tax legislation of the investment sphere and other similar factors which cannot be affected by investors when choosing the investment objects;

б) *non-systematic (or specific).* This kind of risk is typical for a particular investment object or activity of a particular investor. It can be connected with unqualified management of a company (firm) – an investment object, competition improvement in separate investment market segment; irrational structure of investment objects and other similar factors. Effective management of investment process can help to avoid the negative consequences.

Since investment risk characterizes the possibility of unforeseen financial expenditures, its level during the evaluation is defined as the deviation of anticipatory profit on investment and average or calculated amount of contribution. That is why investment risks evaluation is always connected with the evaluation of anticipatory profits and possible expenditures.

For the evaluation of possible financial losses from investment activities, their absolute and relative indexes are used. *Absolute amount of financial losses* connected with the investment risk is the amount of loss (losses) caused to investor (or potentially possible) that occurs due to the adversity arising. *Relative amount of financial losses* connected with the investment risk is the ratio of amount of loss (losses) to selected base indicator (i.e. *to* amount of anticipatory profits of investment; to amount invested in the capital, etc.).

Investment risks are measured by various methods – by calculating the standard deviation, coefficient of variation, beta coefficient and by expertise. Risks are evaluated for every investment project (financial instrument).

Standard deviation is the most common indicator of assessing the investment risk level. Calculation of this indicator allows to consider the fluctuation of anticipatory profits of different investments. Here is the mechanism of risk evaluation based on standard deviation identifying by using the original data shown in Table 6.1.

Comparison of the data on separate investment projects shows that calculated amounts of profit for project "A" fluctuate within the range from 200 to 600 mln. hrn. at the amount of anticipatory profits in whole – 450 mln. hrn. For project "B", the amount of anticipatory profits in whole is also 450 mln. hrn., however their fluctuation is within the range from 100 to 800 mln. hrn. Even such simple comparison allows making a conclusion that the risk of investment implementation for project "A" is significantly lower than for project "B", where the fluctuation of calculated profit is higher.

Table 6.1

Distribution of anticipatory profits possibility for two investment projects

	Investment project "A"			Investment project "B"		
Possible values of investment market conjuncture	Calculated profit, mln hrn	Value of probability	Amount of anticipatory profits, mln hrn (2x3)	Calculated profit, mln hrn	Value of probability	Amount of anticipatory profits, mln hrn (2x3)
High	600	0,25	150	300	0,20	160
Medium	500	0,50	250	450	0,60	270
Low	200	0,25	50	100	0,20	20
Total	1300	1,0	450	850	1,0.	450

The numerical value of this parameter characterizes standard deviation parameter (σ), calculated by the formula:

$$\sigma = \sqrt{\sum_{t=1}^{n} [\varepsilon - \varepsilon_R]^2 \times P_1}$$

where: t - number of periods; n - number of observations; ε - estimated profit on the project at different values of business environment; ε_R - average anticipatory profit of the project; P_1 - probability values corresponding to the estimated profit.

Calculation of this parameter using the given data is shown in the Table 6.2.

Table 6.2

Calculation of the standard deviation for two investment projects

Project versions	Possible values of investment market conjuncture	ε	ε_R	$[\varepsilon - \varepsilon_R]$	$[\varepsilon - \varepsilon_R]^2$	P_1	$[\varepsilon - \varepsilon_R]^2 P_1$	$\sqrt{[\varepsilon - \varepsilon_R]^2 P_1}$
Project "A"	High	600	450	+150	22500	0,25	5625	-
	Medium	500	450	+50	2500	0,50	1250	-
	Low	200	450	-250	62500	0,25	15625	-
	Total	-	450	-	-	1,00	22500	150
Project "B"	High	800	450	+350	122500	0,20	24500	-
	Medium	450	450	0	0	0,60	0	-
	Low	100	450	-350	122500	0,20	24500	-
	Total	-	450	-	-	1,00	49000	221

Section 7

COMMERCIALIZATION OF INNOVATIVE SOLUTIONS AND ASSESSMENT OF INTELLECTUAL PROPERTY RIGHTS

7.1 Intellectual Property as Intangible Asset

Despite the novelty, the lack of required practical experience and the difficulties of theoretical nature, all ways of IP commercialization can be conventionally divided into two groups: the commercialization of IP as an innovative production and the commercialization of IP as a part of innovative production. Innovative product is an intangible result of intellectual activity; in fact, it is an asset of intellectual property. While innovative production includes tangible goods or services manufactured with the application of IP.

Intangible assets – is fundamentally new object of fiscal accounting for Ukraine, which summarizes the specific types of business capital and characterizes its economic strength and financial solvency. The distinctive characteristics of intangible assets are:

– the lack of material basis and, at the same time, the possession of such a valuable quality as the ability to provide income to the owner, based on the long-term rights and benefits being brought for as long as possible;

– the lack of intention to sell intangible assets under the normal conditions of the business activities;

– time of operation allows to consider them being a part of long-term investments as floating assets, and through the chosen version of accounting policy to set more reasonable repayment period of their original cost with a total uncertainty of the operation life (goodwill, trademarks, etc.);

– lack of waste products;

– multi-purpose nature of the operation, allowing to use the object on different parts of the enterprise activities;

– high level of risk in an effort to gain profit from the use of such assets.

The rights of intellectual property asset (IPA) become intangible assets after they are recognized in company's books. For this, at least two conditions should be followed: set a price of rights and the period of their use.

By this feature IPA are divided into two groups: IPA with set period and IPA with indeterminate period of use. This fact has important implications when determining the value of IPA as a commodity, as well as determining its depreciation date when it is on company's books as an intangible asset.

There are legal and economic periods of use. Some IPA have statutory validity period, while others may not have its limitation in time. For example, according to the Law of Ukraine "On Protection of Rights on Inventions and Utility Models", the validity period of patent is 20 years.

However, it is possible that during this time the patent can become morally obsolete because it does not exclude the possibility of new similar and more efficient inventions appearing. Therefore, during the economic calculations of patents for invention a shorter period is set, so-called economic, which is 10-12 years, and in some cases even less.

The statutory validity period is typical for most IPA, but not for all. Thus, the trademark rights have no time limit, since the statutory validity period after its expiry can be extended each time for another 10 years. The rights to such asset of intellectual property as trade secret (know-how) have no statutory validity period.

Note, that after the expiration of the validity period of intellectual property rights, they enter the public domain. Thus, their value is zero. Therefore, the economic period of rights use shall not exceed their validity period.

The purchased or otherwise acquired intellectual property rights are recognized on the enterprise balance as intangible assets if there is a possibility of getting the future economic benefit, connected with their usage, and their cost can be reliably measured.

Another requirement is that intellectual rights, as intangible assets, are held by enterprise in order to use them during the period longer than one year (or one operating cycle, if it exceeds one year) for production, sales, administrative purposes or renting out to other people.

7.2 Commercialization Methods of Intellectual Property Rights

Commercialization of intellectual property assets – is mutually profitable (commercial) actions of all participants of process of the intellectual activities results' transformation into market goods.

Purpose and basic methods of commercialization.

The purpose of commercialization is profit gaining by using the assets of intellectual property right in own production or sale and transmission of rights to their use to other legal body or an individual.

The first way of commercialization is sale or assignment for temporary use of the rights to intellectual property results, or sale of the actual result of intellectual activities (e.g. know-how) in the form of information. Other way is commercialization of intellectual property by its use in manufacture of innovative production. The ways of commercialization of intellectual property rights are schematically shown in the Fig.7.1.

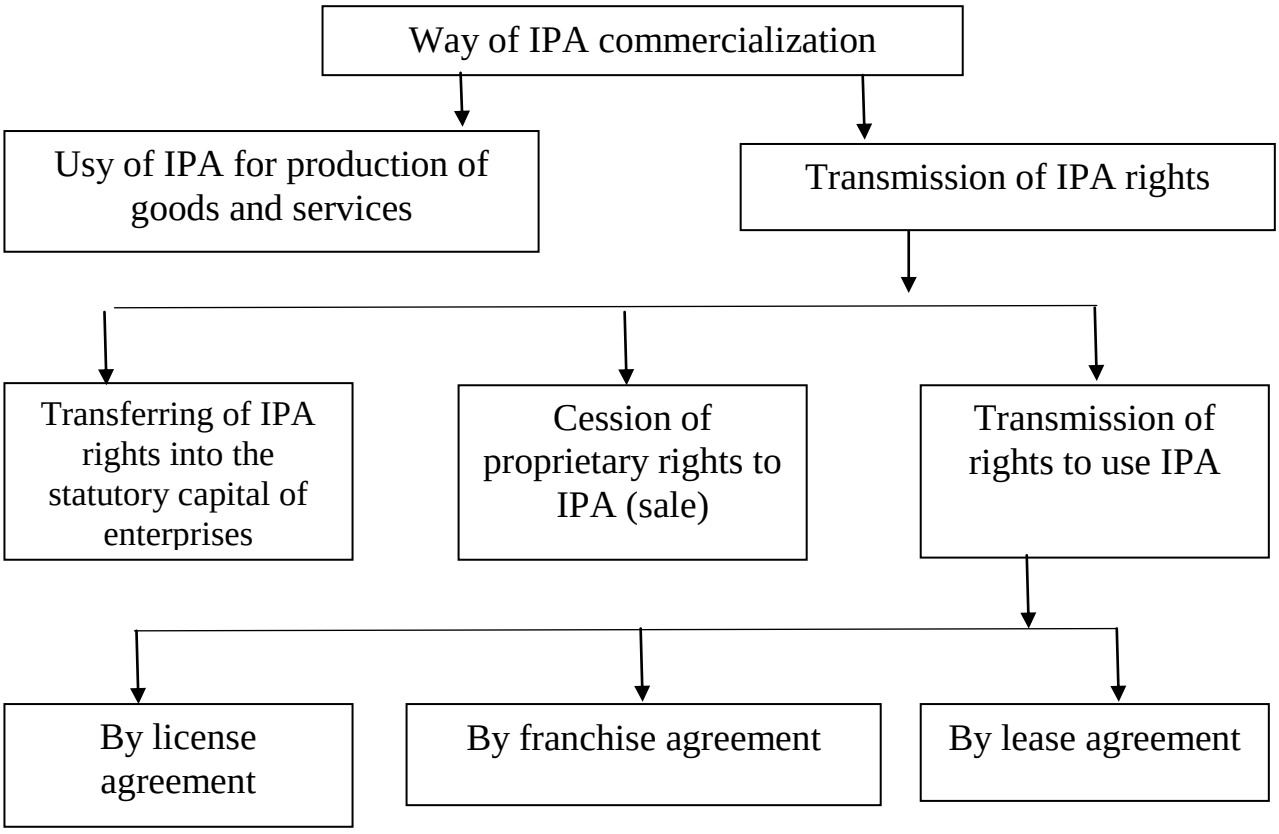


Fig. 7.1 – The primary ways of the commercialization of intellectual property rights

The use of intellectual property assets to manufacture the innovative production.

The commercialization through the intellectual property use for production of goods and services is considered to be the most beneficial in terms of profit. This is because the copyright holder of IPA has all the profit on sales of innovative product received with the help of intellectual property assets. Since the production output can be large, then the income from its realization can be many times higher than the cost of rights to IPA in case of the transmission of rights to use IPA or sale IPA proprietary rights. It is clear that this method of commercialization is connected to the significant start-up costs on completion of IPA, development of production technology, etc. However, in case of success, the income from the products sale compensates these costs and, moreover, the substantial gains can be received.

Transferring of intellectual property into the statutory capital of enterprise.

Intellectual property can be transferred into the statutory capital instead of property, money and other material assets, which requires only good will of all the founders. Use of intellectual property in the statutory capital allows:

- to form a significant in its size statutory capital without diversion of funds and to ensure access to bank loans and investments, using intellectual property as a subject to mortgage along with other types of property;
- depreciate the intellectual property in statutory capital and replace it with tangible assets including depreciation expenses on cost value of production, in other words, to capitalize the intellectual property;
- authors and businesses – owners of intellectual property – become founders (owners) at the organization of subsidiary and autonomous firms without diversion of funds.

Transferring of IPA rights into the statutory capital instead of "hard cash" also provides:

- the right to a share of profits (dividends);
- the right to participate in business management through the general meeting of managing board;
- the right to receive liquidation quota upon the liquidation business, etc.

Transmission of intellectual property rights by agreement.

If the copyright holders do not consider using the intellectual property assets in their own production or starting a new business or establishing a joint venture, they can transmit wholly or partly the property rights to intellectual property assets to other individual or legal body. Sale of rights in full is usually conducted through the sale contract as an agreement of exchange deal, by which as the result of intellectual property right transmission (sale of protection document – patent or equity paper) the owner as a selling party loses all property rights to it. In other words, if the patent for

invention is sold, it is reregistered in the name of new copyright holder and the latter receives all the property rights. However, more often only the right to use intellectual property asset is transmitted.

Owner of rights to any object of industry property unit (*licenser*) *can license* (give authorization to use the intellectual property asset) to any person (*licensee*) if the person is unwilling or unable to use the corresponding object. Vending of a license implies earning a profit without losing capital on production and market development. *Vending of a license – is the way to introduce technology* in the market without selling the market products. By the return on sales of licenses, the legal bodies or individuals cover their costs on research activities. Acquisition or vending of a license is a business agreement. The act of vending or acquisition of a license is legalized by license agreement, which differs from other sale contracts by the fact that intangible asset is sold or acquired. *A licensee obtains the right* to use the intellectual property asset *only at the area predetermined by a license agreement and for a specified period*.

Depending on the extent of the transferred rights under the current Civil Code of Ukraine, there are: exclusive, stand-alone and unexclusive license.

Exclusive license is issued to only one person and excludes the possibility of intellectual property use by the licenser in the field determined by this license.

Stand-alone license is also issued to only one licensee and excludes the possibility of issuing the license for intellectual property use by the licenser to other people in the field limited by this license, but do not exclude the possibility of the object use in this field by the licenser.

Unexclusive license does not exclude the possibility of use by the licenser the asset of intellectual property right and issuing the license to the object use in this field to other people.

By license agreement, the payment of some money consideration to the licenser is always assumed. In most cases, the vending of a license is conducted at calculated contractual price with a reference to the prices of internal and outer markets. *The main types of license payments are royalty, lumpsum and combined payments.*

Royalty – is a type of payment made by the licenser to the licensee during the validity period of license agreement either as revenue share or as amount of turnover from product release or graduated rate from the items of licensed product.

Lumpsum payment – is the payment of defined sum fixed in the agreement to the licenser before the large turnout of licensed product.

Combined payments – being the most common they provide the payout of sustainable initial payment to the licenser by the licensee before the beginning of production and sale of licensed product with further payout of the reminder of

calculated license price as a royalty when the production of licensed product is adjusted. Thus, the licenser can receive allocations from the real income of the licensee during the validity period of license agreement.

Holder of patent can receive the additional income from use of the intellectual property asset at the cost of payments by *franchise agreement* (in Ukraine – agreement of commercial concession). Copyright holder (franchiser) allows another person (franchisee) to use the rights to industrial design, trade names, trademarks, technology, trade secret, etc.

Franchise agreement differs from usual license agreement by fact that the rights are transmitted under favorable, preferential conditions. For example, a user receives ready technology under famous trademark. Therefore, there is no need to regain the position in the market and the risks are minimized. Franchise agreement should contain a condition that the goods and services quality of a franchisee will be not lower than the goods and services quality of a franchiser, and the latter will maintain control over this agreement usage.

A relatively new form of commercialization of intellectual property is *leasing*. Under the lease agreement the different technological equipment, machine units, devices, etc. made at the level of invention and patented are transmitted. That is, along with manufacturing equipment and process the right to use intellectual property is transmitted. Selection of such form of commercialization as leasing allows the emergent entrepreneurs to open and expand their business even with fairly limited start-up capital, by using the modern achievements of scientific and technological progress in the production.

7.3 Value Assessment of Intellectual Property Rights

Purposes of rights assessment. Price is one of the main characteristics of goods. To sell rights to intellectual property assets or use them in own production, their value should be defined. According to International Valuation Standards (IVC-1 … IVC-5), the cost calculation of intellectual property rights can be conducted when determining:

- tax basis of individual assets;
- value of the exclusive rights transferred on the basis of a license agreement or contract of their assignment;
- value of the intellectual (industrial) property assets transferred into the statutory capital of the company;

- amount of compensation, which should be paid due to the current law to the copyright holder for violation of his exclusive (property) rights to the intellectual property asset.

The need of assessment of intellectual property value also occurs in case of recognition in business accounting, privatization, insurance, creation of a mortgage in order to obtain a credit, corporate bankruptcy, etc.

Approaches and methods of assessment.

Methods used to determine the value of intellectual property rights can be divided into three groups: approaches, methods and techniques. Approaches provide the principles of value determination. Methods define the procedure of value determination. Techniques consider the application of methods on specific intellectual property and specific calculation purposes.

Valuation of rights to a particular intellectual property asset in a specific case of their use is rather complicated procedure and requires a unique problem solution in each case. However, with all the variety of cases, there are three generally recognized approaches of assessment of intellectual property rights: cost approach, comparable (market) approach and income approach.

Cost approach (assets-based approach) is based on the assumption that the value of intellectual property asset equals the cost value of its creation, putting into active state and depreciation. This approach to cost calculation is satisfying for buyers, since they can documentary track the costs on intellectual property creation, and thus make sure that this cost is justified. But it is not profitable for the seller, since the latter will receive an amount equal only to the costs incurred for the creation of intellectual property, that is, without profit.

Comparable (market) approach of cost value of intellectual property rights assumes the use of sales comparison approach. The nature of this approach is the comparison of an assessed object with the objects of similar quality and utility, which have been sold at this time in the same market. This approach provides so-called “just price”, i.e. the price for which the seller informed about market value of similar objects is ready to sell the intellectual property asset, and the seller also informed about market value of similar objects is ready to buy this intellectual property asset. In other words, the price is set by the market and is acceptable for both seller and buyer.

Income approach assumes that nobody would invest their own capital to buy an intellectual property asset if the similar income can be obtained by any other way. Under this approach, the value of intellectual property rights is defined as the function of income, which can be obtained by the use of this IPA in the future. To calculate the current value of assessment object, two basic methods are used –

discounting and capitalization of income.

Each approach has one or several methods of assessment. The connection between the approaches is shown in the Table 7.1. The list of given methods is not comprehensive.

Method of asset direct recovery defines the amount of expenses needed to create a new replica of the asset evaluated. The expenses should be based on current prices and raw materials, supplies, energy sources, component parts, data and industry average cost of labor power of certain qualification. The method of direct recovery is the preferable method to calculate the value of the unique intangible assets.

Table 7.1

Connection between the approaches of intellectual property assessment and the methods of assessment

Assessment approach	Assessment method
Cost approach	Method of direct recovery Substitution method Method of outgoing expenses
Comparable (market) approach	Sales comparison method
Income approach	Method of income direct capitalization: - surplus profit; - royalty; - relief from royalty.

Substitution method uses the principle, which states that the maximum value of property is determined by the minimum value, which should be paid when purchasing an asset with similar utility or similar consumer value. This value is called new asset value, which is equivalent in functional capabilities and options of its use, but not necessary a similar asset of intellectual property that is substituted.

Method of outgoing expenses is based on actually reduced expenditures selected from the book accounting of enterprise over the past few years. Special attention should be paid to two factors: their amount and term of asset creation. The expenditures borne earlier should be corrected, if necessary, in the appropriate direction and then indexed according to their limitation of time. Cost approach is usually applied to assess the intangible assets, which do not participate in formation of future profit and are not profitable at the moment, e.g. when the intangible assets being assessed have social implication or are involved in the defense programs, safety programs of state or regional significance.

Sales comparison method is essentially the same as comparable approach. The price of intellectual property assets defined by this method is the most reliable, since it is formed by market. In Ukraine, however, for several reasons (lack of developed market of intellectual property assets, unavailability of databases on the results of intellectual property sales, etc.) this method is almost never used.

Method of direct capitalization is based on transfer of income from commercial use of intellectual property asset to the value of the latter. This method is often used as an express method to calculate residual cost, and sometimes – to evaluate assets, which life cycle is almost undefined. This method procedure involves, firstly, the identification of net income sources and amounts, secondly, the identification of capitalization rates, and, thirdly, the definition of an asset's value as a product of net income divided by the capitalization rate.

Method of surplus profit is based on the assumption that the products manufactured with the use of intellectual property asset brings additional income compared to products manufactured without the intellectual property asset use. The cost is calculated by the formula:

$$PV = \sum_{t=1}^{n} C_t \frac{1}{(1 \pm i)^t},$$

where: PV – calculated cost of the intellectual property asset;

t – accounting period (years);

C_t – flow of money (surplus profit) in the period t;

i – discount rate (decrease).

Royalty method defines the intellectual property cost as a part from royalty base (revenue, profit, and cost of fixed raw materials). The amount of this part is called the royalty rate:

$$PV = \sum_{t=1}^{n} C_t \cdot R,$$

where: C_t –flow of money (royalty base), hrn.;

R – royalty rate, %.

Relief from royalty is a method that involves the calculation of intellectual property cost by formula:

$$PV = \sum_{t=1}^{n} C_t \cdot R \cdot \frac{1}{(1 + i)^t},$$

where: C_t – flow of money (royalty base), hrn.;

i – discount rate, %.

Sequence of assessment.

The principle diagram, reflecting the sequence of assessment of rights to intellectual property, is shown in the Fig. 7.2. The assessment process begins with the identification of the intellectual property asset, i.e., with the establishment of the fact of its legal property and the copyright holder. The next step is to determine the purpose of assessment. After the establishment of assets and purpose of assessment the base of assessment is determined. The assessment base is defined as the type of value that will be used during the assessment. The assessment involves applying of the database, corresponding to the market value or non-market types of value. The non-market types of value include: depreciated replacement cost, value in use, investment values and so on.

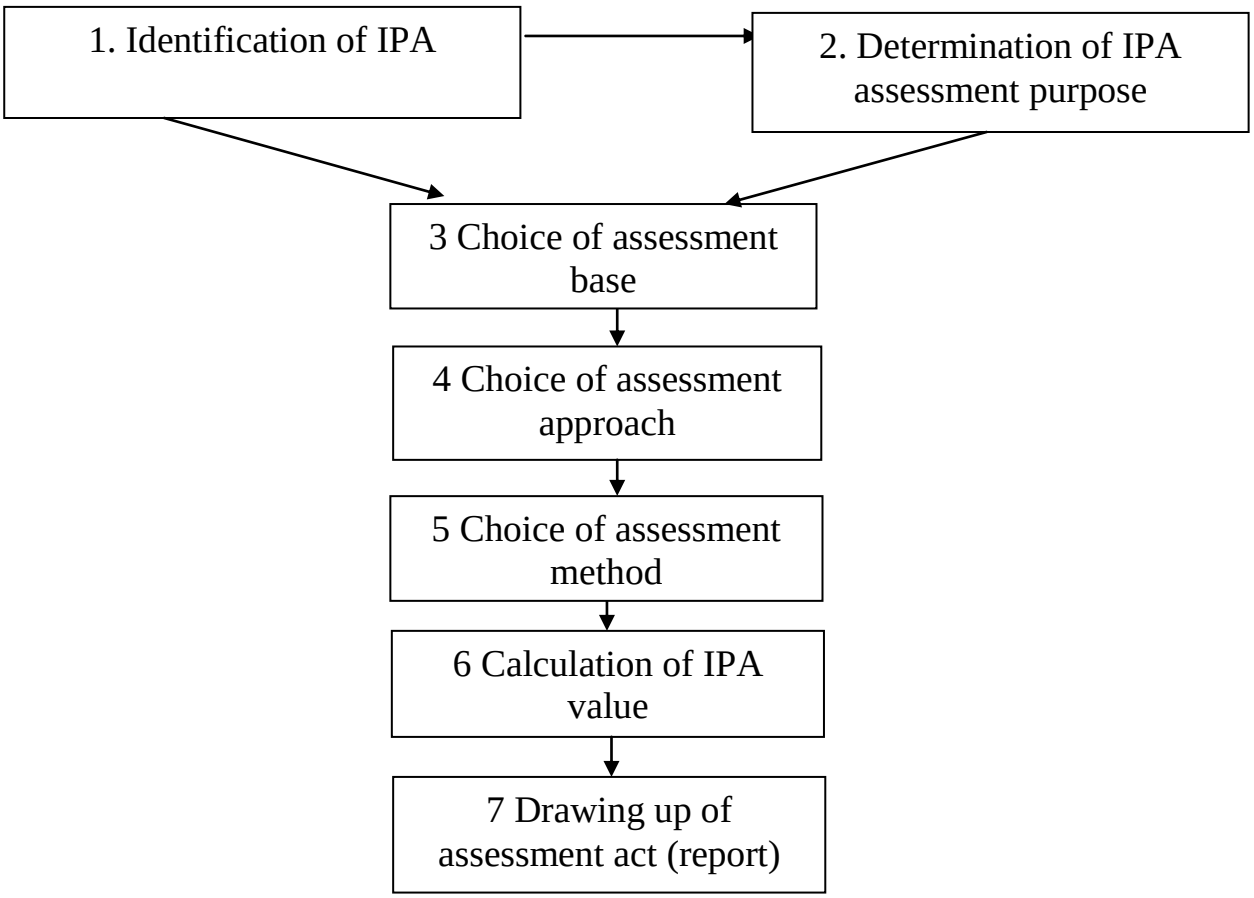


Fig.7.2 – Sequence of assessment of rights to intellectual property

The next step is to choose the assessment approach. The choice of approach is based on the type of intellectual property, purpose and basis of assessment. Once one or other approach was chosen, the method of assessment is selected in its framework. And, finally, the value of IPA rights is calculated. It is desirable to perform the calculation at least by two methods. The assessment procedure concludes with the completion of assessment report, which should reflect the fully justified value of intellectual property asset.

The Accounting Regulation (Standard) 8 "Intangible Assets" describes the intellectual property assets as intangible assets and provides for the accounting of such intellectual property groups:

- Rights to marks and service marks (trademarks, trade names, brand names, and so on.);
- Rights to industrial properties (right to: inventions, utility models, industrial designs, plant and animal varieties, know-how and protection against unfair competition, etc.);
- Copyright and neighboring rights (right to literary and musical property, computer programs, databases, and so on.).

The intellectual property purchased or obtained on a free-of-charge basis is recognized in the balance sheet, provided that it is probable that financial benefits associated with its use will be obtained in the future, and its value can be measured reliably. Thus, in order to register the asset of intellectual property in accounting, it is necessary to determine its value.

Another condition for registering of the asset of intellectual property in accounting is that the terms of use of rights to intellectual property must be at least one year or operational cycle, if it exceeds one year.

The use of intellectual property as an intangible asset in business activities of enterprises and accounting of operations of assets flow allows you to:

- vouch the long-term property rights by recognizing in the balance sheet and create the corresponding funds of depreciation charges;
- receive additional profit from the transfer of rights of intellectual property use and to ensure (depending on the scope of transferred rights) the sound pricing regulation on innovative products of the enterprise;
- remunerate individuals with royalty fees, omitting the wages fund, carrying the royalty fees expenses on the product costs balance sheet “Other costs”, that is without limitation of amounts of payments and without traditional contributions to insurance and other funds.

Thus, the registration of intellectual property in accounting is one of the options for intellectual property commercialization and enables the company to get additional profit.

Properties of assessment of rights to certain intellectual property.

Assessment of rights to inventions and utility models. Consider the evaluation of the rights to these objects on the basis of cost, comparative and income approach.

Evaluation on the basis of cost approach. In the framework of the cost approach, as an example we use the method of initial costs. According to this method the value of rights to the invention or utility model, produced on own enterprise can

be defined by the formula:

$$PV = k_1 \cdot \sum_{t=1}^{n} 3_t \cdot \frac{k_{2t}}{k_{3t}},$$

where: k_1 – coefficient of moral ageing, defined at the date of assessment:

$$k_1 = 1 - \frac{t_p}{t_n},$$

where: t_p – practical legal validity period of a protection document at the date of assessment;

t_n – nominal (full) validity period of a protection document;

3_t – total annual costs in the t-*th* period, hrn.

k_{2t} – indexation rate taking into account changes in the price index in the t-*th* period in the relevant industries (defined by bank or by discount rate or by sectorial price indices or by pension indexation coefficients)

k_{3t} – discount coefficient in the t-*th* period:

$$k_{3t} = \frac{1}{\left(1 + \frac{i_t}{100}\right)^t},$$

where: i – bank interest for the use of capital in the t-*th* period, %.

Division (instead of usual subtraction) by the discount factor in the basic formula represents the fact that if money was not invested in the present IPA but operated on the capital market (e.g. was placed on deposit), it would render a profit on the use of the capital in proportion to the bank interest. Thus the periods count starts from the date of assessment in previous periods, that is, the earlier these costs were, the more money at the time of assessment the deposit could bring.

During the costs assessment all actual costs, costs involved in the development, legal protection and implementation of IPA are determined:

$$3_t = 3_{pt} + 3_{ot},$$

where: 3_{pt} – IPA development costs, hrn.; 3_{ot} – IPA legal protection costs, hrn.

In turn:

$$3_{pt} = 3_{нир} + 3_{ктд},$$

where: $\boldsymbol{3_{нир}}$ – R&D costs, hrn.; $\boldsymbol{3_{ктд}}$ – development costs of engineering and technical, technological and/or design documentation, involved in the IPA establishment, hrn.

$$З_{нир}=З_{п}+З_{ти}+З_{э}+З_{і}+З_{про}+З_{ін},$$

where: $З_{п}$ –discovery costs, hrn.; $З_{ти}$ – theoretical studies costs, hrn; $З_{э}$ – experimentation costs , hrn; $З_{і}$ – tests (performance) costs, hrn; $З_{об}$ – reports compilation, hearing, approval costs , hrn.; $З_{ін}$ – other costs.

$$З_{ктд}=З_{эп}+З_{тп}+З_{рп}+З_{р}+З_{і}+З_{ан}+З_{д},$$

where: $З_{эп}$ – predesign costs, hrn.; $З_{тп}$ – technical project implementation costs, hrn.; $З_{рп}$ –working project implementation costs, hrn.; $З_{р}$ – calculations costs, hrn.; $З_{і}$ – tests performance costs, hrn.; $З_{ан}$ – author's supervision costs, hrn.; $З_{д}$ – design costs, hrn.

The more complete the costs will be considered, the more reasonable will be the results of assessment. In fact, the maximum value of the right is calculated in this method, as all the profits are attributed to IPA, i.e. during the auction, it can be used as an "upper bound estimate". The accuracy of the method may be enhanced by bringing the value of money spent in previous years to its present value.

Comparative approach. To determine the value of IPA according to the comparative (market) approach it is necessary to gather, analyze and systematize the data on commercial conditions of concluded licensing and other agreements for the transfer of rights to IPA and their price in the international and domestic markets on a sectoral principle and on this basis create databases.

Determination of market value of rights to IPA on the basis of available analogues can be possible only with appropriate comparison of goals, parameters, scope and terms of the rights and characteristics of assessed rights to IPA and analogue.

The commercial selling value of production with IPA on the basis of sales comparison is determined through making of price lists of comparable objects, matching commercial terms of sales and technical level of the estimated object with existing analogues.

Comparative data available in databases, including validity periods of agreements, royalty rates, commercial selling values, etc., further used to specify calculation parameters obtained at assessment of rights to IPO based on the income approach.

Income approach. In the framework of income approach the assessment of rights to the invention and utility model is often carried out by the method of surplus profit.

The "surplus profit" describes the difference between the profit gained from the use of invention or utility model, and the profit the producer receives from the sale of products without the use of invention or utility model. This annual profit advantage is

discounted, considering the estimated period of its receiving.

The value of rights to invention or utility model according to this method can be determined by the formula:

$$PV = \sum_{t=1}^{n} P_t \cdot \frac{1}{(1+\frac{i_t}{100})^t},$$

where: P_t –net surplus profit, generated through the use of invention or utility model in *t* period, hrn.; i_t – rate of discount, %; n – number of t periods, in which gaining of surplus profit is expected.

$$P_t = P_{to} \cdot V_t,$$

where: P_{to} – net surplus profit, generated through the use of invention or utility model in *t* period, related to the production unit, hrn.; V_t – number of units produced in *t* period.

The term "net" means a profit without tax. According to the Law of Ukraine "On Enterprise Profit Tax" the income tax is 25%.

Assessment of rights to utility model. The value of rights to utility model can be determined by the formula:

$$PV = k \cdot \sum_{t=1}^{n} P_t \cdot \frac{1}{\left(1+\frac{i_t}{100}\right)^t},$$

where P_t – net profit, obtained in *t* period from the technological item, which used the utility model, hrn.; n – number of t periods, in which gaining of profit from the technological item is expected ; i_t – rate of discount in *t* period, %.

The value of P_t is calculated by the formula:

$$P_t = P_{to} \cdot V_t,$$

where P_{to} –net profit, obtained from the single technological item in *t* period, hrn.; V_t –number of technological items, produced in *t*, items.; k – share profits from the technological item, which used the utility model.

$$k = k_1 \cdot k_2 \cdot k_3,$$

where k_1 – originality index of the utility model; k_2 – complexity index of design problem solving; k_3 – production output index.

Selection of numerical values of indices is shown in tables 7.2-7.4.

Table 7.2

Originality index of the utility model (k1)

No.	Originality	Index value k_1
1	The application of well-known art and design tools, while in the list of essential features of the utility model is used only the term "application"	0,25
2	The use of a new totality of art and design tools to differentiate the industrial design from the closest analogue.	0,3
3	The industrial design has a prototype, which coincides with the industrial design in terms of a large number of essential features	0,4
4	The industrial design has a prototype, which coincides with the industrial design in terms of a half of the essential features	0,5
5	The industrial design has a prototype , which coincides with the industrial design in terms of less significant features	0,6
6	The industrial design doesn't have any prototype	0,8

Table 7.3

Complexity index of design problem solving (k2)

No.	Complexity of the solved design problem	Index value k_2
1	The appearance of one simple detail	0,2
2	The appearance of complex detail or assembly detail of a minor component	0,3
3	The appearance of one major component or several minor components	0,4
4	The appearance of major components	0,5
5	The appearance of a simple machine, device, machine toll, instrument, building	0,7
6	The appearance of a complex machine, machine toll, device, instrument, building	0,9
7	The appearance of flow lines	1,1
8	The appearance of conceptually new technological items	1,25

Table 7.4

Production output index (k3)

No.	Production output	Index value k_3
1	Test pattern	0,2
2	Development batch	0,3
3	Small batch	0,4
4	Medium batch	0,6
5	Big batch	0,8
6	High-volume production	1,0

Assessment of rights to trade mark. The importance and therefore the value of rights to trademark depends much more on the reputation of the company which owns it, the duration of its stay in the market and the quality of goods or services of this brand than on the right to invention, utility model or industrial design. The value of rights to trademark can be calculated using the empirical equation:

$$PV = C \cdot K,$$

where C – base cost: development of brand for goods and services, obtaining of legal protection, advertising and usage costs, hrn.; K – index.

$$K = K_1 \cdot K_2 \cdot K_3 \cdot K_4,$$

where K_1 – index, taking into account the life time of the trademark (since the beginning of large-scale advertising using the trademark); K_2 – index, taking into account the life expectancy of the firm (enterprise) in the market.

Years	1	2	3	...	10 and more
K_1, K_2	1,0	1,2	1,3	...	2,0

K_3 – the scope of usage of trademark for goods and services depending on the trade flow:

The scope of trade flow per month, ths. $ US	Up to 10	10-50	50-100	100-500	500-1000	More than 1000
K_3	1,0	1,2	1,4	1,6	1,8	2,0

$K_4 = 1,4$ – constant, taking into account other uncounted K_1, K_2 і K_3 parameters.

In most cases related to the copyright object the assessment of rights value comes down to the determination of the amount of the remuneration to the author for the use

of these objects. With regard to the objects of neighboring rights it is usual to determine the remuneration to performers, producers of phonograms, videograms or to broadcasting organizations. Generally, approaches and methods that have been applied to the assessment of rights to industry property units, taking into account a number of features, can be applied to the assessment of the copyright object and neighboring rights. The main approach to the assessment of the copyright object and neighboring rights is the income approach, and within its frames - the method of royalty.

According to the method of royalty the value of rights to the copyright object and neighboring rights, provided that the remuneration for the use of rights will be paid in the form of royalty payments, that is, in equal installments at the end of each period, can be determined by the formula:

$$PV = \sum_{t=1}^{n} C_t \cdot \frac{R_t}{100},$$

where: t – periods (years), in which income from the use of rights to these objects is expected to receive, $t=1, 2, 3 \ldots n$; C_t –base of royalty in t period, hrn.; R_t – royalty rate in t period,%.

If the remuneration is expected in the form of lumpsum (one-time) payment, the following formula can be used for calculation:

$$PV = \sum_{t=1}^{n} C_t \cdot \frac{R_t}{100} \cdot \frac{1}{\left(1+\frac{i}{100}\right)^t},$$

where: i – rate of discount, %;

From the comparison of this formula with the previous one becomes apparent that the size of lumpsum payment will be less than the payment of royalty, whereas the last formula introduces the multiplier - the discount rate, the value of which is less than unity. The royalty base comprises the amount of the gross output obtained from the sale of tickets for the public performance of a work or a program, or income received from the business activity involving the use of the copyright or neighboring rights and in the absence of such income - total cost of the event, during which the copyright and neighboring rights are used. Royalty rates are generally negotiated between the licensor and the licensee. Recommendations for choosing the royalty rate for literary works can be found in the work. But royalty rates in any case may not be less than those specified by the Cabinet of Ministers of Ukraine.

Assessment of rights to computer programs. Computer programs (software programs) are copyright objects, methods for the assessment of rights value to them

are practically absent**.** If the program is developed for the use in their own production or made to order, then its cost can be calculated on the basis of assets, for example with the help of the *method of initial costs*. According to Accounting Regulation (Standard) 16 "Costs" the program base cost may include:

- salaries of the core staff (in this case programmers, task originator, designers, employees testing the finished program, form source database, etc.), and also charges on payroll;
- direct material costs: the cost of consumed electricity and the carriers on which the program will be recorded;
- other costs: consumables, business trips of core staff (if they are related to the creation of the program), services of other organizations (if they are involved in creation of the program) etc. (tab. 7.5).

Table 7.5

Example of cost calculation for the computer program

No.	Items	Sum, hrn.
1	Salaries of programmers	12000
2	Charges on payroll	4440
3	Software depreciation	1000
4	Depreciation of technical costs	1500
5	Electricity	600
6	Consumables	300
7	Outsourced services	1500
	Total:	21340
	Value-added tax (20%)	4268
	Total:	25608

Determination of the value of rights to the use of literary property.

Determination of value of these rights is necessary when you conclude the contract between the author and publisher for the use of rights to the property, and in other cases. The value of rights may be determined by the royalty method described above. You need to determine the royalty rate and royalty base. A royalty base usually is assumed as the volume of sales for a particular period of time, rather than the cost of printed copies or planned circulation.

Assessment of goodwill. Although the goodwill is not a part of the intellectual property defined by the Civil Code of Ukraine, but in the market economy it plays an important role and its content in fact is the result of creative activity, i.e. intellectual property assets not registered in accounting. The cost of goodwill is considered in

terms of purchases or sales of enterprises. Below you can find the method and the example of goodwill assessment, based on the formula of the tax administration of the US. According to this method the actual cost of goodwill is determined after taxation by the formula:

$$PV = \frac{П_{ср} - П_{MA}}{K},$$

where: $П_{ср}$ – average annual present profit of the enterprise after taxation; $П_{MA}$ – average annual profit of tangible assets exclusive of liability sides (based on the chosen standard rate of return for the industry); K – capitalization rate.

The calculation is performed in the following sequence: 1. Determination of the average profit of the company for the accounting period (at least 5 years); 2. Determination of the average cost of tangible assets during the same period; 3. Determination of the profit generated by the tangible assets:

$$П_{MA}=C_{MA}\cdot H_n,$$

where: C_{MA} - average costs of tangible assets; H_n – average profit margin in the industry;

The value of goodwill is determined by the formula:

$$PV = \frac{П_{ср} - П_{MA}}{K}. \qquad (3)$$

Below is the example of calculation of the goodwill cost (tab. 7.6, 7.7).

Table 7.6

Calculation of average annual profit R_{av}

Budget year	Profit after taxation	Correction	Present profit, hrn.
1	71479	-	71479
2	57616	5692	51924
3	66540	743	65797
4	72920	10791	62129
5	58720	9405	49315
Total in 5 years			300644
Average annual profit for 5 years			60129

Table 7.7

Calculation of average cost of tangible assets ATA, hrn.

Budget year	Cost of all assets	Cost of intangible assets*)	Passives	Cost of tangible assets, hrn.
1	477869	37512	74992	365365
2	497257	45165	86721	365371
3	513470	52711	86343	374416
4	640144	61362	190597	388185
5	665152	79605	207560	327987
Total in 5 years				1871324
Average for 5 years				374265

*) Applied to assets registered in business accounting

Calculate the profit on tangible assets (norm is 10%):
R_{TA}=374265·0,1=37426 hrn.

Calculate the cost of goodwill (with the capitalization coefficient of 0,2):

$$PV = \frac{60129 - 37426}{0,2} = 113515 \text{ hrn.}$$

It is obvious, that this method has limits, because it allows determining of cost through the total income obtained at the expense of all mass of tangible and intangible assets that are on the enterprise balance. However, if the enterprise has no intangible assets on its balance or their cost is low, such assessment can be very accurate. In case when a specific contribution to the income of intangible assets being on the enterprise balance is low, this method of assessment is very economical.

The abovementioned method of goodwill cost determination is fully applicable for Ukraine, since according to the experts evaluation, the intangible assets value in our enterprises is in average does not exceed.

Section 8

RISK MANAGEMENT

8.1 Key Terms, Descriptions and Principles of Risk Management

Risk is a measure of future uncertainties in achieving project performance goals and objectives within defined cost, schedule and performance constraints. Risk can be associated with all aspects of a project (e.g., threat, technology maturity, supplier capability, design maturation, performance against plan,) as these aspects relate across the Work Breakdown Structure (WBS) and Integrated Master Schedule (IMS). Risk addresses the potential variation in the planned approach and its expected outcome. While such variation could include positive as well as negative effects, this guide will only address negative future effects since projects have typically experienced difficulty in this area during the acquisition process.

Components of Risk Risks have three components:

- A future root cause (yet to happen), which, if eliminated or corrected, would prevent a potential consequence from occurring,
- A probability (or likelihood) assessed at the present time of that future root cause occurring, and
- The consequence (or effect) of that future occurrence.

A future root cause is the most basic reason for the presence of a risk. Accordingly, risks should be tied to future root causes and their effects.

Risk versus Issue Management. Risk management is the overarching process that encompasses identification, analysis, mitigation planning, mitigation plan implementation, and tracking. Risk management should begin at the earliest stages of project planning and continue throughout the total life-cycle of the project. Additionally, risk management is most effective if it is fully

integrated with the project's systems engineering and project management processes— as a driver and a dependency on those processes for root cause and consequence management. A common misconception, and project office practice, concerning risk management is to identify and track issues (vice risks), and then

manage the consequences (vice the root causes). This practice tends to mask true risks, and it serves to track rather than resolve or mitigate risks. This guide focuses on risk mitigation planning and implementation rather on risk avoidance, transfer or assumption.

Note: Risks should not be confused with issues. If a root cause is described in the past tense, the root cause has already occurred, and hence, it is an issue that needs to be resolved, but it is not a risk. While issue management is one of the main functions of PMs, *an important difference between issue management and risk management is that issue management applies resources to address and resolve current issues or problems, while risk management applies resources to mitigate future potential root causes and their consequences.*

To illustrate the difference between a risk and an issue, consider, for example, a commercial-off-the-shelf (COTS) sourcing decision process. Questions such as the following should be asked and answered prior to the COTS decision:

- *"Is there any assurance the sole source provider of critical COTS components will not discontinue the product during government acquisition and usage?"*
- *"Does the government have a back-up source?"*
- *"Can the government acquire data to facilitate production of the critical components?"* .

These statements lead to the identification of root causes and possible mitigation plans. If a COTS acquisition is decided, and sometime later the manufacturer of a COTS circuit card has informed the XYZ radar builder that the circuit card will be discontinued and no longer available within 10 months, then an *issue* has emerged and with upfront planning the issue might have been prevented. A *risk* is the likelihood and consequence of **future** production schedule delays in radar deliveries if a replacement card cannot be found or developed and made available within 10 months.

If a project is behind schedule on release of engineering drawings to the fabricator, this is not a risk; it is an issue that has already emerged and needs to be resolved. Other examples of issues include failure of components under test or analyses that show a design shortfall. These are project problems that should be handled as issues instead of risks, since their probability of occurrence is 1.0 (certain to occur or has occurred). It should also be noted that issues may have adverse future consequences to the project (as a risk would have).

Risk Management Objective. PMs have a wide range of supporting data and processes to help them integrate and balance projectmatic constraints against risk. The Acquisition Project Baseline (APB) for each project defines the top-level cost, schedule, and technical performance parameters for that project. Additionally,

acquisition planning documents such as Life-Cycle Cost Estimates (LCCE), Systems Engineering Plans (SEP), IMS, Integrated Master Plans (IMP), Test and Evaluation Master Plans (TEMP) and Technology Readiness Assessment (TRA) provide detailed cost, schedule, and technical performance measures for project management efforts. Since effective risk management requires a stable and recognized baseline from which to access, mitigate, and manage project risk it is critical that the project use an IMP/IMS. Processes managed by the employer, such as the IMP, employer IMS, and Earned Value Management (EVM), provide the PM with additional insight into balancing project requirements and constraints against cost, schedule, or technical risk. The objective of a well-managed risk management project is to provide a repeatable process for balancing cost, schedule, and performance goals within project funding, especially on projects with designs that approach or exceed the state-of-the-art or have tightly constrained or optimistic cost, schedule, and performance goals. Without effective risk management the project office may find itself doing crisis management, a resource-intensive process that is typically constrained by a restricted set of available options. Successful risk management depends on the knowledge gleaned from assessments of all aspects of the project coupled with appropriate mitigations applied to the specific root causes and consequences.

A key concept here is that the government shares the risk with the development, production, or support employer (if commercial support is chosen), and does not transfer all risks to the employer. The project office always has a responsibility to the system user to develop a capable and supportable system and can not absolve itself of that responsibility. Therefore, all project risks, whether primarily managed by the project office or by the development/support employer, are of concern and must be assessed and managed by the project office. Once the project office has determined which risks and how much of each risk to share with the employer, it must then assess the total risk assumed by the developing employer (including contract employers). The project office and the developer must work from a common risk management process and database. Successful mitigation requires that government and the employer communicate all project risks for mutual adjudication. Both parties may not always agree on risk likelihoods, and the government PM maintains ultimate approval authority for risk definition and assignment. A common risk database available and open to the government and the employer is an extremely valuable tool. Risk mitigation involves selection of the option that best provides the balance between performance and cost. Recall that schedule slips generally and directly impact cost. It is also possible that throughout the system life cycle there may be a need for different near-term and long-term mitigation approaches.

An effective risk management process requires a commitment on the part of the

PM, the project office and the employer to be successful. Many impediments exist to risk management implementation, however, the project team must work together to overcome these obstacles. One good example is the natural reluctance to identify real project risks early for fear of jeopardizing support of the project by decision makers. Another example is the lack of sufficient funds to properly implement the risk mitigation process. However, when properly resourced and implemented, the risk management process supports setting and achieving realistic cost, schedule, and performance objectives and provides early identification of risks for special attention and mitigation.

8.2 Risk Management

The Risk Management Process. Risk management is a continuous process that is accomplished throughout the life cycle of a system. It is an organized methodology for continuously identifying and measuring the unknowns; developing mitigation options; selecting, planning, and implementing appropriate risk mitigations; and tracking the implementation to ensure successful risk reduction. Effective risk management depends on risk management planning; early identification and analyses of risks; early implementation of corrective actions; continuous monitoring and reassessment; and communication, documentation, and coordination.

Acquisition project risk management is not a stand-alone project office task. It is supported by a number of other project office tasks. In turn, the results of risk management are used to finalize those tasks. Important tasks, which must be integrated as part of the risk management process, include requirements development, logical solution and design solution (systems engineering), schedule development, performance measurement, EVM (when implemented), and cost estimating. Planning a good risk management project integral to the overall project management process ensures risks are handled at the appropriate management level.

Emphasis on risk management coincides with overall efforts to reduce life-cycle costs (LCC) of system acquisitions. New processes, reforms, and initiatives are being implemented with risk management as a key component. It is essential that projects define, implement and document an appropriate risk management and mitigation approach. Risk management should be designed to enhance project management effectiveness and provide PMs with a key tool to reduce LCC, increase project likelihood of success, and assess areas of cost uncertainty.

The Risk Management Process Model. The risk management process model (see figure 8.1) includes the following key activities, performed on a continuous basis:

- Risk Identification,
- Risk Analysis,
- Risk Mitigation Planning,
- Risk Mitigation Plan Implementation, and
- Risk Tracking.

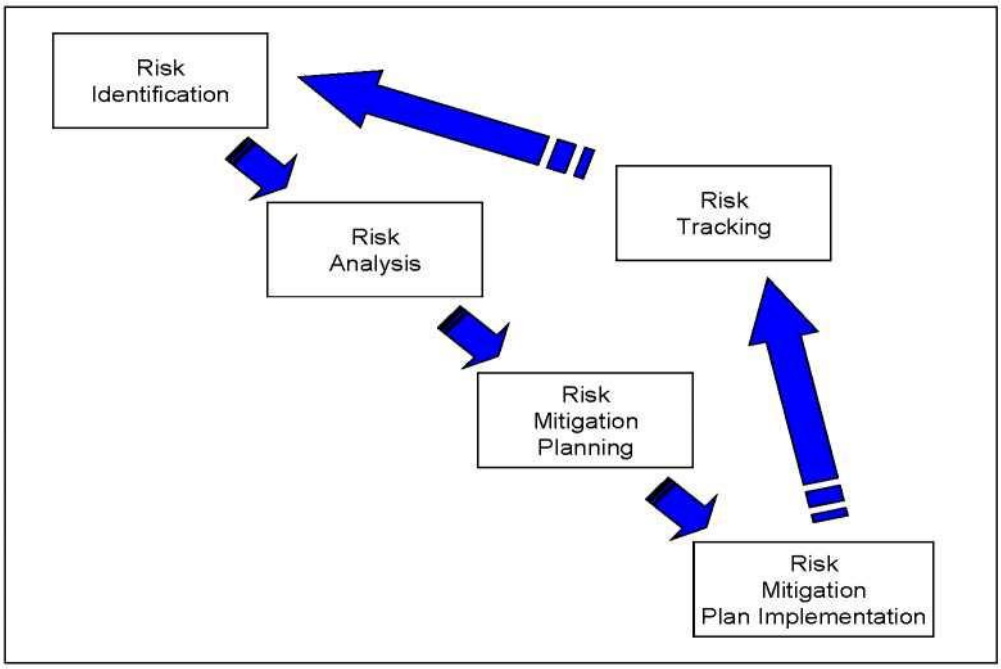


Fig. 8.1 - Risk Management Process

Acquisition projects run the gamut from simple to complex procurements and support of mature technologies that are relatively inexpensive to state-of-the-art and beyond projects valued in the multibillions of dollars. Effective risk management approaches generally have consistent characteristics and follow common guidelines regardless of project size. Some characteristics of effective risk management approach are discussed below.

Characteristics of Successful Risk Management Approaches.

Successful acquisition projects will likely have the following risk management characteristics:

- Feasible, stable, and well-understood user requirements, supported by leadership / stakeholders, and integrated with project decisions;
- A close partnership with users, industry, and other stakeholders;
- A planned risk management process integral to the acquisition process, especially to the technical planning (SEP and TEMP) processes, and other project related partnerships;
- Continuous, event-driven technical reviews to help define a project that

satisfies the user's needs within acceptable risk;

- Identified risks and completed risk analyses;
- Developed, resourced, and implemented risk mitigation plans;
- Acquisition and support strategies consistent with risk level and risk mitigation plans;
- Established thresholds and criteria for proactively implementing defined risk mitigation plans;
- Continuous and iterative assessment of risks;
- The risk analysis function independent from the PM;
- A defined set of success criteria for performance, schedule, and cost elements; and
- A formally documented risk management process.

To support these efforts, assessments via technical reviews should be performed as early as possible in the life cycle (as soon as performance requirements are developed) to ensure critical performance, schedule, and life-cycle cost risks are addressed, with mitigation actions incorporated into project planning and budget projections.

Top-Level Guidelines for Effective Risk Management.

- Assess the root causes of project risks and develop strategies to manage these risks during each acquisition phase.
  - Identify as early as possible, and intensively manage those design parameters that critically affect capability, readiness, design cost, or LCC.
  - Use technology demonstrations, modeling and simulation, and aggressive prototyping to reduce risks.
  - Include test and evaluation as part of the risk management process.
- Include industry participation in risk management. Offerors should have a risk approach as part of their proposals as suggested in this guide to identify root causes and develop plans to manage those risks and should include a draft RMP. Additionally, the offering side should identify risks as they perceive them as part of the proposal. This not only helps the government identify risks early, but provides additional insight into the level of understanding of the project requirements.
- Use a proactive, structured risk assessment and analysis activity to identify and analyze root causes.
  - Use the results of prior event-based systems engineering technical reviews to analyze risks potentially associated with the successful completion of an upcoming review. Reviews should include the status of identified risks.
  - Utilize risk assessment checklists (available for all event-based technical reviews) in preparation for and during the conduct of technical reviews.
  - Establish risk mitigation plans and obtain resources against that plan.

- Provide for periodic risk assessments throughout each project life-cycle phase.

- Establish a series of "risk assessment events," where the effectiveness of risk reduction conducted to date is reviewed. These "risk assessment events" canbe held as part of technical reviews, risk review board meetings, or periodic project reviews. These events should include the systems engineering technical reviews, be tied to the IMP at each level, and have clearly defined entry and exit criteria reviewed during IBRs.
- Include processes as part of risk assessment. This would include the employer's managerial, development, and manufacturing processes as well as repair processes for the sustainment phase.
- Review the employer's baseline plans as part of the IBR process which includes joint government/employer evaluation of the inherent risks in the employer's integrated earned value baseline (work definition, schedule, and budgets).
- Review the employer's Schedule Risk Assessment (SRA) when provided as part of the IMS data item. Review the realism of the employer's estimate at completion. Assess the overall likelihood of the employer achieving the forecasted schedule or final costs against the project's constraints.
- Establish a realistic schedule and funding baseline for the project as early as possible in the project, incorporating not only an acceptable level of risk, but adequate schedule and funding margins.
- Clearly define a set of evaluation criteria for assigning risk ratings (low, moderate, high) for identified root causes.
- Determine the project's approach to risk prioritization, commonly presented in the risk reporting matrix.

8.3 Risk Identification

The first key activity in the risk management process is Risk Identification. In some publications "risk assessment" is used as an umbrella term that includes the primary activities of both risk identification and risk analysis.

The intent of risk identification is to answer the question "What can go wrong?" by:

- Looking at current and proposed staffing, process, design, supplier, operational employment, resources, dependencies, etc.,
- Monitoring test results especially test failures (readiness results and readiness problems for the sustainment phase),

- Reviewing potential shortfalls against expectations, and
- Analyzing negative trends.

Risk identification is the activity that examines each element of the project to identify associated root causes, begin their documentation, and set the stage for their successful management. Risk identification begins as early as possible in successful projects and continues throughout the project with regular reviews and analyses of Technical Performance Measurements (TPMs), schedule, resource data, life-cycle cost information, EVM data/trends, progress against critical path, technical baseline maturity, safety, operational readiness, and other project information available to project IPT members.

Risk can be associated with all aspects of a project, e.g., operational needs, attributes, constraints, performance parameters including Key Performance Parameters (KPPs), threats, technology, design processes, or WBS elements. Consequently it is important to recognize that risk identification is the responsibility of every member of the IPT, not just the PM or systems engineer.

Examination of a project is accomplished through decomposition into relevant elements or areas. Decomposition may be oriented to requirements, processes, functional areas, technical baselines, or acquisition phases. Another method is to create a WBS as early as possible in a project for a product-oriented decomposition, which is particularly useful in identifying product and some process oriented risks. Other means, such as a process- oriented framework, would be required to sufficiently illuminate process-based root causes, which could be tracked via the WBS structure to view impacts to schedule, resource loading, etc.

To identify risks and their root causes, IPTs should break down project elements to a level where subject matter experts (SMEs) can perform valid identification by WBS or IMS line item number. The information necessary to do this varies according to the lifecycle phase of the project. During decomposition, risks can be identified based on prior experience, brainstorming, lessons learned from similar projects, and guidance contained in the project office RMP. A structured approach describes each WBS element in terms of sources or areas of risk. The examination of each element and process against each risk area is an exploratory exercise to identify the critical root causes. The investigation may show that risks are inter-related.

WBS product and process elements and industrial engineering, manufacturing and repair processes are often sources of significant root causes. Risks are determined by examining each WBS element and process in terms of causes, sources, or areas of risk. When EVM is applied on a contract it can help identify WBS project elements that are experiencing issues. This information can be used to help prioritize WBS elements that may contain unidentified risks.

Identification of Root Causes. Project offices should examine their projects and

identify root causes by reducing project elements to a level of detail that permits an evaluator to understand the significance of any risk and identify its causes. This is a practical way of addressing the large and diverse number of risks that often occur in acquisition projects. For example, a WBS level 4 or 5 element may be made up of several root causes associated with a specification or function, e.g., potential failure to meet turbine blade vibration requirements for an engine turbine design.

Root causes are identified by examining each WBS product and process element in terms of the sources or areas of risk. Root causes are those potential events that evaluators (after examining scenarios, WBS, or processes) determine would adversely affect the project at any time in its life cycle.

An approach for identifying and compiling a list of root causes is to:

- List WBS product or process elements,
- Examine each in terms of risk sources or areas,
- Determine what could go wrong, and
- Ask "why" multiple times until the source(s) is discovered.

The risk identification activity should be applied early and continuously in the acquisition process, essentially from the time performance and readiness requirements are developed. The project office should develop and employ a formalized risk identification procedure, and all personnel should be responsible for using the procedure to identify risks. Specific opportunities to identify risks (e.g., at event-driven technical reviews) and explore root causes against objective measures (e.g., meeting the entry criteria for an upcoming technical review, requirements stability, technical maturity, software lines of code and reuse ratios, critical paths or near critical paths) should not be overlooked. If technical reviews are schedule, vice event driven, their usefulness as risk assessment tools can be impacted, and the full benefits of risk assessment may not be achieved. The early identification and assessment of critical risks allows for the formulation of risk mitigation approaches and the streamlining of both the project definition and the Request For Proposal (RFP) processes around those critical product and process risks. Risk identification should be done again following any major project change or restructure such as significant schedule adjustment, requirements change, or scope change to the contract.

Typical risk sources include:

- Threat. The sensitivity of the project to uncertainty in the threat description, the degree to which the system design would have to change if the threat's parameters change, or the vulnerability of the project to foreign intelligence collection efforts (sensitivity to threat countermeasure).
- Requirements. The sensitivity of the project to uncertainty in the system

description and requirements, excluding those caused by threat uncertainty. Requirements include operational needs, attributes, performance and readiness parameters (including KPPs), constraints, technology, design processes, and WBS elements.

- Technical Baseline. The ability of the system configuration to achieve the project's engineering objectives based on the available technology, design tools, design maturity, etc. Project uncertainties and the processes associated with the "ilities" (reliability, supportability, maintainability, etc.) must be considered. The system configuration is an agreed-to description (an approved and released document or a set of documents) of the attributes of a product, at a point in time, which serves as a basis for defining change.
- Test and Evaluation. The adequacy and capability of the test and evaluation project to assess attainment of significant performance specifications and determine whether the system is operationally effective, operationally suitable, and interoperable.
- Modeling and Simulation (M&S). The adequacy and capability of M&S to support all life-cycle phases of a project using verified, validated, and accredited models and simulations.
- Technology. The degree to which the technology proposed for the project has demonstrated sufficient maturity to be realistically capable of meeting all of the project's objectives.
- Logistics. The ability of the system configuration and associated documentation to achieve the project's logistics objectives based on the system design, maintenance concept, support system design, and availability of support data and resources.
- Production/Facilities. The ability of the system configuration to achieve the project's production objectives based on the system design, manufacturing processes chosen, and availability of manufacturing resources (repair resources in the sustainment phase).
- Concurrency. The sensitivity of the project to uncertainty resulting from the combining or overlapping of life-cycle phases or activities.
- Industrial Capabilities. The abilities, experience, resources, and knowledge of the employers to design, develop, manufacture, and support the system.
- Cost. The ability of the system to achieve the project's life-cycle support objectives. This includes the effects of budget and affordability decisions and the effects of inherent errors in the cost estimating technique(s) used (given that the technical requirements were properly defined and taking into account known and unknown project information).
- Management. The degree to which project plans and strategies exist and are

realistic and consistent. The government's acquisition and support team should be qualified and sufficiently staffed to manage the project.

- Schedule. The sufficiency of the time allocated for performing the defined acquisition tasks. This factor includes the effects of projectmatic schedule decisions, the inherent errors in schedule estimating, and external physical constraints.
- External Factors. The availability of government resources external to the project office that are required to support the project such as facilities, resources, personnel, government furnished equipment, etc.
- Budget. The sensitivity of the project to budget variations and reductions and the resultant project turbulence.
- Earned Value Management System. The adequacy of the employer's EVM process and the realism of the integrated baseline for managing the project.

Developers' engineering and manufacturing processes that historically have caused the most difficulty during the development phases of acquisition projects are frequently termed critical risk processes. These processes include, but are not limited to, design, test and evaluation, production, facilities, logistics, and management.

Additional areas, such as manpower, ESOH, and systems engineering, that are analyzed during project plan development provide indicators for additional risk. The project office should consider these areas for early assessment, since failure to do so could cause significant consequences in the project's latter phases.

PMs must recognize that, in the past, classified projects have experienced difficulty in access, facilities, clearances, and visitor control. Failure to manage these aspects of a classified project could adversely impact schedules. Not only are classified projects at risk, but any project that encompasses Information Assurance is burdened by ever increasing security requirements and certifications. These risks must be identified as early as possible as they affect design, development, test, and certification requirements that will impose schedule challenges to the project.

8.4 Risk Analysis

The intent of risk analysis is to answer the question "How big is the risk?" by:

- Considering the likelihood of the root cause occurrence;
- Identifying the possible consequences in terms of performance, schedule, and cost; and
- Identifying the risk level using the Risk Reporting Matrix shown in Figure 8.2.

Risk Reporting Matrix.

Each undesirable event that might affect the success of the project (performance, schedule, and cost) should be identified and assessed as to the likelihood and consequence of occurrence. A standard format for evaluation and reporting of project risk assessment findings facilitates common understanding of project risks at all levels of management. The Risk Reporting Matrix below is typically used to determine the level of risks identified within a project. The level of risk for each root cause is reported as low (green), moderate (yellow), or high (red).

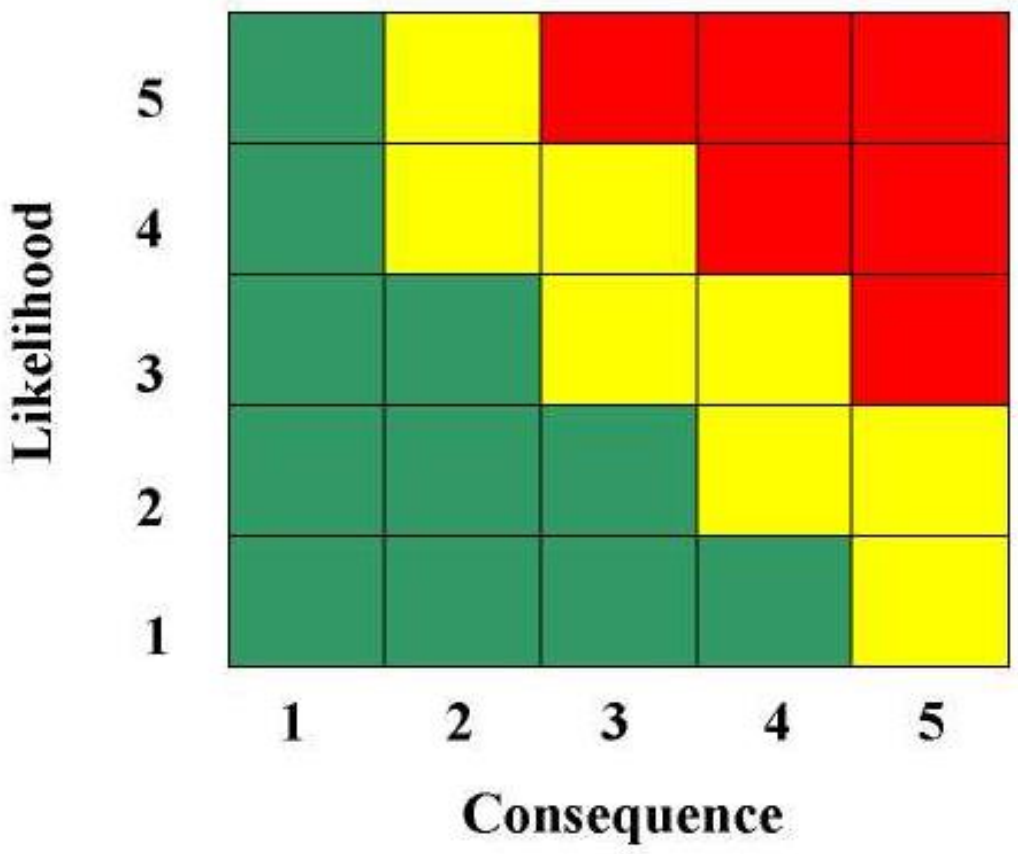


Fig. 8.2 - Risk Reporting Matrix

The level of likelihood of each root cause is established utilizing specified criteria (Figure 8.3). For example, if the root cause has an estimated 50 percent probability of occurring, the corresponding likelihood is Level 3.

Likelihood

Level	Likelihood	Probability of Occurrence
1	Not Likely	~10%
2	Low Likelihood	~30%
3	Likely	~50%
4	Highly Likely	~70%
5	Near Certainty	~90%

Fig. 8.3 - Levels of Likelihood Criteria

The level and types of consequences of each risk are established utilizing criteria such as those described in Figure 8.4. A single consequence scale is not appropriate for all projects, however. Continuing with the prior example of a root cause with a 50 percent probability of occurring, if that same root cause has no impact on performance or cost, but may likely result in a minor schedule slippage that won't impact a key milestone, then the corresponding consequence is a Level 3 for this risk. For clarity it is also classified as a *schedule* risk since its root cause is schedule related.

The results for each risk are then plotted in the corresponding single square on the Risk Reporting Matrix. In this example, since the level of likelihood and consequence were both "3," the corresponding schedule risk is reported as "yellow," as shown in Figure 8.5, using a recommended display method that includes the risk title (where (S) identifies this risk as a schedule risk), risk causal factor, and mitigation approach.

Level	Technical Performance	Schedule	Cost
1	Minimal or no consequence to technical performance	Minimal or no impact	Minimal or no impact
2	Minor reduction in technical performance or supportability, can be tolerated with little or no impact on project	Able to meet key dates. **Slip < * month(s)**	Budget increase or unit production cost increases. **< ** (1% of Budget)**
3	Moderate reduction in technical performance or supportability with limited impact on project objectives	Minor schedule slip. Able to meet key milestones with no schedule float. **Slip < * month(s)** **Sub-system slip > * month(s) plus available float.**	Budget increase or unit production cost increase **< ** (5% of Budget)**
4	Significant degradation in technical performance or major shortfall in supportability; may jeopardize project success	Project critical path affected. **Slip < * months**	Budget increase or unit production cost increase **< ** (10% of Budget)**
5	Severe degradation in technical performance; Cannot meet KPP or key technical/supportability threshold; will jeopardize project success	Cannot meet key project milestones. **Slip > * months**	Exceeds APB threshold **> ** (10% of Budget)**

Fig. 8.4 - Levels and Types of Consequence Criteria

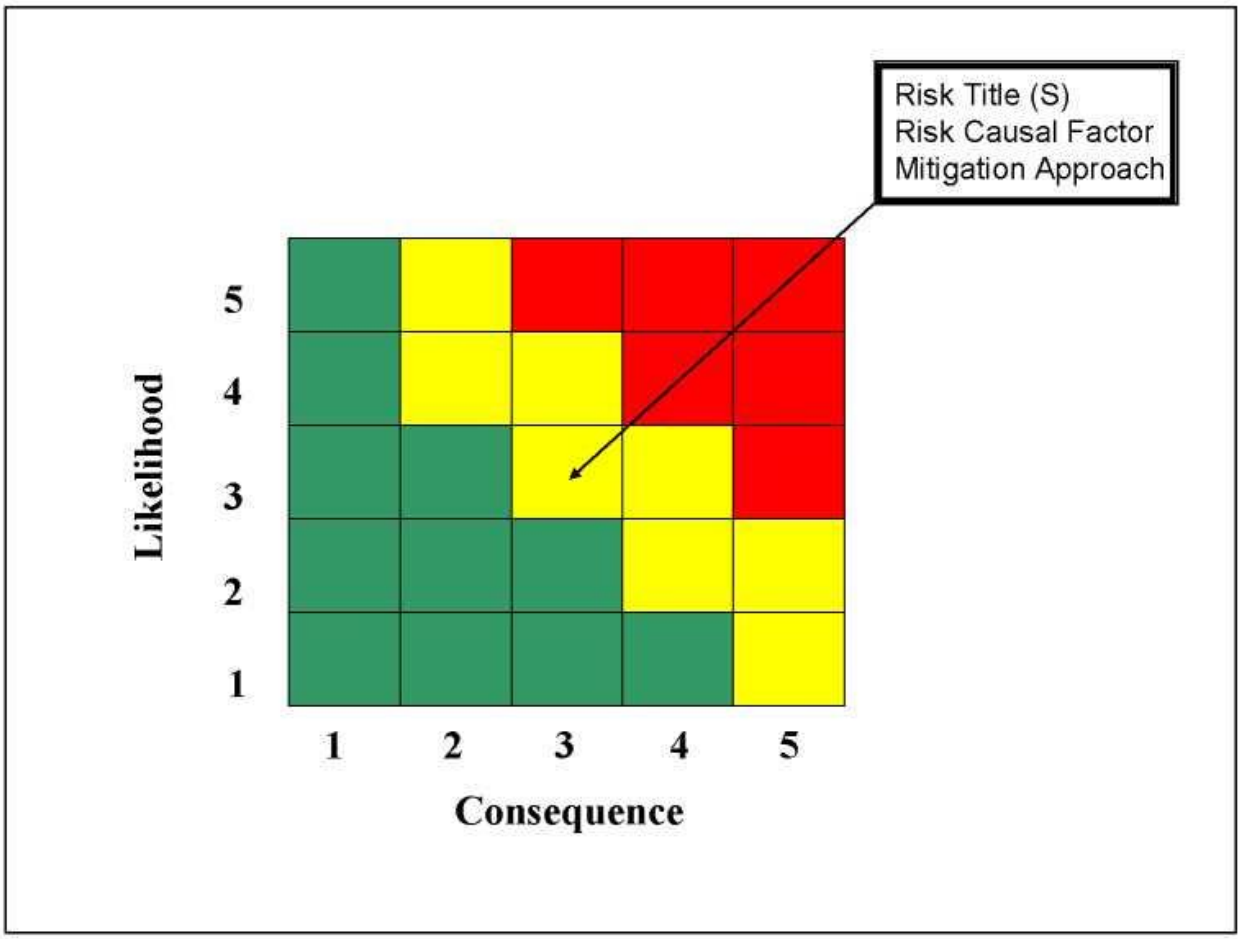


Fig. 8.5. Risk Analysis and Reporting Illustration

Risk analysis is the activity of examining each identified risk to refine the description of the risk, isolate the cause, determine the effects, aid in setting risk mitigation priorities. It refines each risk in terms of its likelihood, its consequence, and its relationship to other risk areas or processes. Analysis begins with a detailed study of the risks that have been identified. The objective is to gather enough information about future risks to judge theroot causes, the likelihood, and the consequences if the risk occurs. The frequently used term "risk assessment" includes the distinct activities of risk identification and risk analysis.

Risk analysis sequence of tasks include:

- Develop probability and consequence scales by allocating consequence thresholds against the WBS or other breakout;
- Assign a probability of occurrence to each risk
- Determine consequence in terms of performance (P), schedule (S), and/or cost (C) impact using the criteria,
- Document the results in the project risk database.

Note: Risk analysis is a snapshot in time and may change significantly during the project. Risk analyses must be periodically re-accomplished to ensure the analysis remains current.

In a WBS approach, risks are identified, assessed, and tracked for individual WBS elements at their respective levels (primarily for impact on cost and schedule performance) and for their resulting effect on the overall product. Each product's associated costs and schedule can be readily baselined, and its risk consequence can be measured as a deviation against this baseline. Taking the WBS to successively lower levels will help to assure all required products are identified, along with allocations for cost and schedule performance (as well as operational performance) goals.

Integration of performance, schedule, and cost analyses into a single process provides a final product that starts with well-defined requirements, builds upon a solid technical foundation, develops a realistic project schedule, and documents the resources needed in the project cost estimates. Project root cause identification and analysis integrates the technical performance assessment, schedule assessment, and cost estimates using established risk evaluation techniques. Each of these risk categories (cost, schedule, performance) has activities of primary responsibility, but is provided inputs and support from the other two risk categories. This helps to keep the process integrated and to ensure the consistency of the final product.

The following paragraphs provide relevant questions to ask in assessing performance, schedule, and cost root causes.

Performance (P) Considerations.

Is there an impact to technical performance and to what level? If so, this risk has a performance consequence. These risks generally have associated schedule and cost impacts, but should be carried as a performance risk.

- Operational (e.g., Initial Capabilities Document (ICD), Capability Development Document (CDD), Capability Production Document (CPD), threats, suitability, effectiveness).
- Technical (e.g., SEP, Technology Readiness Levels, specifications, TEMP, technical baselines, standards, materiel readiness)
- Management (e.g., organization, staffing levels, personnel qualifications/experience, funding, management processes, planning, documentation, logistics)

Schedule (S) Considerations.

Is there an impact to schedule performance and to what level? If the risk does not have a first order performance impact, then ask this question. If the risk does impact the critical path, then it impacts both schedule and cost, but should be carried as a schedule risk.

Were any problems that caused schedule slips identified as risks prior to their occurrence? If not, why not? If yes, why didn't the associated mitigation plan succeed? The IPTs should analyze impact of the risk to the IMS and the critical path(s), to include:

- Evaluating baseline schedule inputs (durations and network logic);
- Incorporating technical assessment and schedule uncertainty inputs to the project schedule model;
- Evaluating impacts to project schedule based on technical team assessment;
- Performing schedule analysis on the project IMS, incorporating the potential impact from all contract schedules and associated government activities;
- Quantifying schedule excursions reflecting the effects of cost risks, including resource constraints;
- Providing a government schedule assessment for cost analysis and fiscal year planning, reflecting the technical foundation, activity definition, and inputs from technical and cost areas; and
- Documenting the schedule basis and risk impacts for the risk assessment.
- Projecting an independent forecast of the planned completion dates for major milestones.

Cost (C) Considerations.

Does the risk only impact life-cycle cost? If so, with no performance or schedule impacts, the risk is a cost risk, and may impact estimates and assessments such as:

- Building on technical and schedule assessment results;
- Translating performance and schedule risks into life-cycle cost;
- Deriving life-cycle cost estimates by integrating technical assessment and schedule risk impacts on resources;
- Establishing budgetary requirements consistent with fiscal year planning;
- Determining if the adequacy and phasing of funding supports the technical and acquisition approaches;
- Providing project life-cycle cost excursions from near-term budget execution impacts and external budget changes and constraints; and
- Documenting the cost basis and risk impacts.

NOTE: Cost and funding are not the same. Cost is related to the amount of money required to acquire and sustain a commodity, and funding is the amount of money available to acquire and sustain that commodity.

Risk Analysis Illustration.

The following example illustrates what has been presented in this section with the critical card example used earlier:

The project office has identified a risk in conducting a developmental test.

- The first question to ask is why the test might not be able to be conducted. The answer is that the circuit cards for one component may not be available. In asking the question "why" a second time, the answer is that power conversion circuit cards for one component may not be available in time for system integration to meet the test schedule. The risk causal factor is this availability of power conversion circuit cards. (Alternately, if the power conversion circuit card is no longer in production, then you have a completely different risk that will require a different mitigation plan.) Thus, this is a schedule risk.
- The next question to ask is whether this test is on the critical path or near the critical path. Again, the answer is determined to be "no" because the test has some schedule risk mitigating slack. Therefore the consequence is minimal since it will not likely impact a major milestone. Thus, this risk is reported as shown in Figure 8.6.

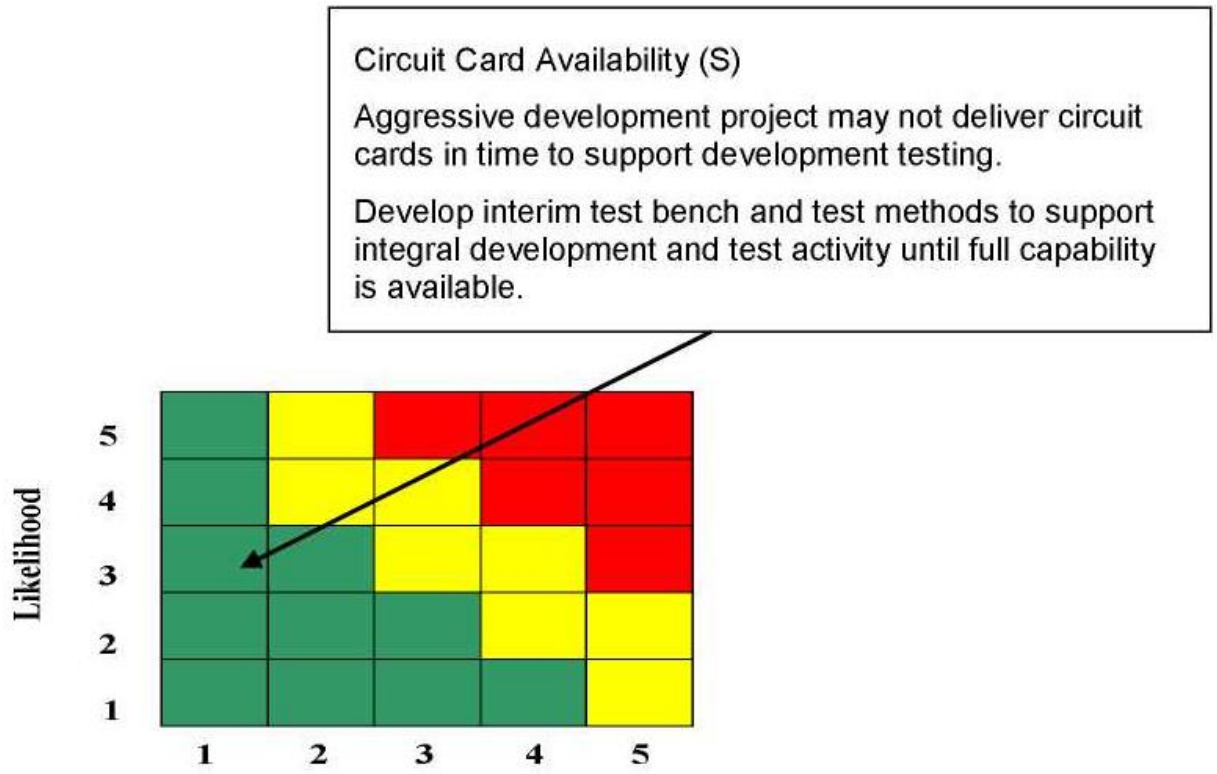


Fig. 8.6 - An Example of Risk Reporting

8.5 Risk Mitigation Planning

The intent of risk mitigation planning is to answer the question "*What is the project approach for addressing this potential unfavorable consequence?"* One or more of these mitigation options may apply:

- Avoiding risk by eliminating the root cause and/or the consequence,
- Controlling the cause or consequence,
- Transferring the risk, and/or
- Assuming the level of risk and continuing on the current project plan.

Risk mitigation planning is the activity that identifies, evaluates, and selects options to set risk at acceptable levels given project constraints and objectives. Risk mitigation planning is intended to enable project success. It includes the specifics of **what** should be done, **when** it should be accomplished, **who** is responsible, and the **funding** required to implement the risk mitigation plan. The most appropriate project approach is selected from the mitigation options listed above and documented in a risk mitigation plan.

The level of detail depends on the project life-cycle phase and the nature of the need to be addressed. However, there must be enough detail to allow a general estimate of the effort required and technological capabilities needed based on system complexity.

For each root cause or risk, the type of mitigation must be determined and the details of the mitigation described.

Once alternatives have been analyzed, the selected mitigation option should be incorporated into project planning, either into existing project plans or documented separately as a risk mitigation plan (not to be confused with the risk management plan).

The risk mitigation plan needs to be realistic, achievable, measurable, and documented and address the following topics:

- A descriptive title for the identified risk;
- The date of the plan;
- The point of contact responsible for controlling the identified root cause;
- A short description of the risk (including a summary of the performance, schedule, and resource impacts, likelihood of occurrence, consequence, whether the risk is within the control of the project);
- Why the risk exists (root causes leading to the risk);
- The options for mitigation (possible alternatives to alleviate the risk);

- Definition of events and activities intended to reduce the risk, success criteria for each plan event, and subsequent "risk level if successful" values;
- Risk status (discuss briefly);
- The fallback approach (describe the approach and expected decision date for considering implementation);
- A management recommendation (whether budget or time is to be allocated, and whether or not the risk mitigation is incorporated in the estimate at completion or in other project plans);
- Appropriate approval levels (IPT leader, higher-level Product Manager, Systems Engineer, PM); and
- Identified resource needs.

8.6 Risk Mitigation Plan Implementation

The intent of risk mitigation (plan) execution is to ensure successful risk mitigation occurs. It answers the question *"How can the planned risk mitigation be implemented?"*. It:

- determines what planning, budget, and requirements and contractual changes are needed;
- provides a coordination vehicle with management and other stakeholders;
- directs the teams to execute the defined and approved risk mitigation plans;
- outlines the risk reporting requirements for on-going monitoring;
- documents the change history.

Risk assessment (identification and analysis) is accomplished by risk category. Each risk category (e.g., performance, schedule, and cost) includes a core set of assessment tasks and is related to the other two categories. These interrelationships require supportive analysis among areas to ensure the integration of the assessment. Implementing risk mitigation should also be accomplished by risk category, and it is important for this process to be worked through the IPT structure, requiring the IPTs at each WBS level to scrub and endorse the risk mitigations of lower levels. It is important to mitigate risk where possible before passing it up to the next WBS level. In addition, each IPT must communicate potential cost or schedule growth to all levels of management. It is imperative that the Systems Engineer and PM understand and approve the mitigation plan and examine the plan in terms of secondary, unforeseen impacts to other elements of the project outside of the risk owning IPT. As part of this effort, the IPTs should ensure effective mitigation plans are implemented and ongoing results of the risk management process are formally documented and briefed, as appropriate, during project and technical reviews.

When determining that it may be appropriate to lower the consequence of a risk, careful consideration should be given to the justification for doing so, including identifying exactly what about the risk has changed between the time of the original consequence assessment and the current risk state to justify such a reassessment.

8.7 Risk Tracking

The intent of risk tracking is to ensure successful risk mitigation. It answers the question *"How are things going?"* by:

- Communicating risks to all affected stakeholders,
- Monitoring risk mitigation plans,
- Reviewing regular status updates,
- Displaying risk management dynamics by tracking risk status within the Risk Reporting Matrix
- Alerting management as to when risk mitigation plans should be implemented or

adjusted.

Risk tracking activities are integral to good project management. At a top level, periodic project management reviews and technical reviews provide much of the information used to identify any performance, schedule, readiness, and cost barriers to meeting project objectives and milestones.

Risk tracking documents may include: project metrics, technical reports, earned value reports, watch lists, schedule performance reports, technical review minutes/reports, and critical risk processes reports.

An event's likelihood and consequences may change as the acquisition process proceeds and updated information becomes available. Therefore, throughout the project, a project office should reevaluate known risks on a periodic basis and examine the project for new root causes. Successful risk management projects include timely, specific reporting procedures tied to effective communication among the project team.

Risk tracking is the activity of systematically tracking and evaluating the performance of risk mitigation actions against established metrics throughout the acquisition process. It feeds information back into the other risk activities of identification, analysis, mitigation planning, and mitigation plan implementation as shown in Figure 1.

The key to the tracking activity is to establish a management indicator system over the entire project. The PM uses this indicator system to evaluate the status of the

project throughout the life cycle. It should be designed to provide early warning when the likelihood of occurrence or the severity of consequence exceeds pre-established thresholds/limits or is trending toward exceeding pre-set thresholds/limits so timely management actions to mitigate these problems can be taken.

The project office should re-examine risk assessments and risk mitigation approaches concurrently. As the system design matures, more information becomes available to assess the degree of risk inherent in the effort. If the risk changes significantly, the risk mitigation approaches should be adjusted accordingly. If the risks are found to be lower than previously assessed, then specific risk mitigation actions may be reduced or canceled and the funds reprogrammed for other uses. If they are higher, or new root causes are found, appropriate risk mitigation efforts should be implemented.

In addition to reassessing (identifying and analyzing) risks, the project office should look for new risk mitigation options. Alternative technologies may mature, new products may become available in the market place, or may be information found in unexpected places. All of these may be of use to the project office for risk mitigation. A periodic review of developments in the laboratory, and the market place is time well invested for any project.

Reporting & Documentation. The purpose of risk reporting is to ensure management receives all necessary information to make timely and effective decisions. This allows for coordination of actions by the risk team, allocation of resources, and a consistent, disciplined approach. A primary goal of risk reporting should be to provide the PM with an effective early warning of developing risk.

Risk documentation is the recording, maintaining, and reporting of identifications, analyses, mitigation planning and implementation, and tracking results. Risk tracking should be done as part of technical reviews, risk review board meetings, or periodic project reviews. Documentation includes all plans and reports for the PM and decision authorities and reporting forms that may be internal to the project office. This is consolidated in the Risk Mitigation Plan.

Risk reporting should present standard likelihood and consequence screening criteria, as well as the Risk Reporting Matrix. The details regarding consequences for cost, schedule, and performance should be documented in each Risk Mitigation Plan. The plotted position on the risk reporting matrix should show the PM’s current assessment of the risk’s likelihood and the estimated severity of its effect on the project if mitigation fails. As risk mitigation succeeds in a project, a yellow or red risk’s position on the Risk Reporting Matrix will migrate in successive assessments from its current location toward the green. Each risk description should include three key elements (Figure 6 provides an example):

- A brief description, including both the title and type (P, S or C), of the risk,

- A brief description of the risk root causal factor(s), and
- The planned mitigations, along with critical dates (risk reduction milestones), that address the root cause(s) and effect(s).

8.8 Planning/Preparation for Risk Management

Risk management is a key element of a PM's executive decision-making. Risk management is based on the principles that risk management must be forward-looking, structured, continuous, and informative. The key to successful risk management is early planning, resourcing, and aggressive execution.

Good planning enables an organized, comprehensive, and iterative approach for managing root causes. Networking within government and industry to extract the best ideas, techniques, methods, and information can only help teams seeking to improve their implementation of risk management.

Risk Planning. Risk planning is the activity of developing and documenting an organized, comprehensive, and interactive strategy and methods for identifying and tracking root causes, developing risk-mitigation plans, performing continuous risk assessments to determine how risks and their root causes have changed, and assigning adequate resources.

Risk planning is the detailed formulation of a project of action for the management of root causes. Risk planning, and the resultant plan, should answer the questions: "who, what, where, when, and how." It is the activity to:

- Ensure the principles of this guide are applied to the project;
- Develop and document an organized, comprehensive, and interactive risk management plan;
- Determine the methods to be used to execute a PM's Risk Management Plan (RMP); and
- Plan for adequate resources, including personnel.

Risk planning is iterative, and includes describing and scheduling the tasks for risk identification, risk analysis, risk mitigation planning, resourcing, risk mitigation plan implementation, and risk tracking throughout a project's life cycle. Since employer abilities to develop and manufacture the system affect project risks, the employer should be considered a valuable partner in risk planning. The result is the RMP.

Risk Management Plan. The project office should establish the basic approach and working structure it will use and document that approach it in a RMP. A

comprehensive and consistent approach ensures all aspects of the project are examined for risk. The RMP is integral to overall project planning and the project IMP, and/or the SEP, or it may be a stand-alone document, as long as the activities are integrated and consistent.

Planning begins by developing and documenting a risk management strategy. Early efforts establish the purpose and objective, assign responsibilities for specific areas, identify additional technical expertise needed, describe the assessment process and areas to consider, delineate considerations for mitigation planning, define a rating scheme, dictate the reporting and documentation needs, and establish report requirements. This planning should also address evaluation of the capabilities of potential sources as well as early industry involvement. The PM's strategy to manage root causes provides the project team with direction and a basis for planning.

Risk planning consists of the upfront activities needed for a successful risk management project. At the end of each acquisition phase, risk planning is the heart of the preparation for the next phase. Initially formalized during Concept Refinement or other first-phase planning, and updated for each subsequent acquisition phase in all increments of the project, the risk management process should be reflected in the project SEP and in the technology development, acquisition, and support strategies.

These strategies, along with requirement and threat documents, and system and project characteristics, are sources of information for the project office to use in developing the RMP. The RMP tells the government and employer team how to get from where the project is today to where the PM wants it to be in the future. The key to writing a good plan is to provide the necessary information so the project team knows the goals, objectives, and the project office's risk management process. Although the plan may be specific in some areas, such as the assignment of responsibilities for government and employer participants and definitions, it may be general in other areas to allow users to choose the most efficient way to proceed. For example, a description of techniques that suggests several methods for evaluators to use to assess risk is appropriate, since every technique may have advantages and disadvantages depending on the situation.

As a project transitions through developmental and operational testing, and then to the end users during sustainment, a project RMP should be structured to identify, assess, and mitigate risks that have a impact on overall project life-cycle cost, schedule, and/or performance. The RMP should also define the overall project approach to capture and manage root causes.

An example RMP format summary may include:

- Introduction
- Project Summary
- Risk Management Strategy and Process

- Responsible/Executing Organization
- Risk Management Process and Procedures
- Risk Identification
- Risk Analysis
- Risk Mitigation Planning
- Risk Mitigation Implementation
- Risk Tracking

Normally, documentation and reporting procedures are defined as part of the risk management process planning before contract award, but they may be added or modified during contract execution as long as the efforts remain within the scope of the contract or are approved as part of a contract change.

The project office should periodically review the RMP and revise it, if necessary. Events such as these may drive the need to update an existing RMP:

- A change in acquisition strategy,
- Preparation for a milestone decision,
- Results and findings from event-based technical reviews,
- An update of other project plans,
- Preparation for a Project Objective Memorandum submission, or
- A change in support strategy.

Organizing for Risk Management. In systems engineering, risk management examines all aspects of the project phases as they relate to each other, from conception to disposal. This risk management process integrates design (performance) requirements with other life-cycle issues such as manufacturing, operations, and support.

The PM should establish a risk management process that includes not only risk planning, but risk identification, risk analysis, risk mitigation planning, resourcing, risk mitigation plan implementation, and risk tracking to be integrated and continuously applied throughout the project, including during the design process.

Risk assessment includes identification and analysis of sources of root causes to include performance, schedule, and cost, and is based on such factors as the technology being used and its relationship to design; manufacturing capabilities; potential industry sources; and test and support processes.

In a decentralized project office risk management organization, the project's risk management coordinator may be responsible for risk management planning, and IPTs typically perform the risk assessments. In a centralized project office risk management organization, the project’s risk management coordinator may be responsible for risk management planning and perform the risk assessments. In either case, if necessary, the team may be augmented by people from other project areas or

outside experts. Section 0 elaborates on this for each of the described assessment approaches. Typically, a project-level IPT may conduct a quick-look assessment of the project to identify the need for technical experts (who are not part of the team) and to examine areas that appear most likely to contain risk.

Effective risk management requires involvement of the entire project team and may also require help from outside experts knowledgeable in critical risk areas (e.g., threat, technology, design, manufacturing, logistics, schedule, cost). In addition, the risk management process should cover hardware, software, the human element, and interfaces and other integration issues. Outside experts may include representatives from the user, laboratory, contract management, specialty engineering, test and evaluation, logistics, industry, and sustainment communities. End product users, essential participants in project trade analyses, should be part of the assessment process so that an acceptable balance among performance, schedule, cost, and risk can be reached.

Risk Management Boards. A risk management tool used on many projects is the Risk Management Board (RMB). This board is chartered as the senior project group that evaluates all project risks and their root causes, unfavorable event indications, and planned risk mitigations. In concept, it acts similar to a configuration control board. It is an advisory board to the PM and provides a forum for all affected parties to discuss their concerns. RMBs can be structured in a variety of ways, but share the following characteristics:

- Working relationships between the board and the project office staff functional support team should be defined.
- The process flow for the RMB should be defined.
- The frequency of the RMB meetings should be often enough to provide a thorough and timely understanding of the risk status, but not too frequent to interfere with the execution of the project plan. Frequency may depend on the phase of the project; e.g., a development project may require monthly RMBs, while a production or support project may hold quarterly RMBs.
- Interfaces with other project office management elements (such as the various working groups and the configuration control board) should be formally defined.

On projects with many significant root causes, the RMB provides an effective vehicle to ensure each root cause is properly and completely addressed during the project life cycle. It is important to remember that successful risk tracking is dependent on the emphasis it receives during the planning process. Further, successful project execution requires the continual tracking of the effectiveness of the risk mitigation plans.

The project management team can assign the risk management responsibility to

individual IPTs or to a separate risk management team. In addition, the project office should establish the working structure for risk identification and risk analysis.

Risk Assessment Approaches. For each risk assessment, the project office team must establish how the actual assessment (root cause identification and risk analysis) will be conducted. At least four choices are available:

- Conduct the assessment as part of the normal IPT activity of the project office;
- Establish a project office risk assessment team, as either a temporary ad-hoc team or a permanent organization;
- Establish a Government-industry team; or
- Request an outside team or combined project office-outside team conduct the assessment.

Each approach has its own merits and costs. However, the choices are not mutually exclusive. Project offices could use two or more of these options in combination or for different aspects of the project. An internal effort should always be conducted so that project office personnel are familiar with the risks.

Teams outside the project office may be appropriate if the resources needed to do the assessment are beyond those available from within the project team. First, establish a core risk assessment team if the project team is not already following a disciplined project acquisition process which incorporates risk assessment activities. This team is the core group of individuals who will conduct the risk assessment and normally includes individuals with expertise in systems engineering, logistics, manufacturing, test, schedule analysis, and cost estimating.

Regardless of the method(s) chosen, the employer team's input should be solicited and included in the final assessment. If the project is not already on contract, the risk assessment team should also try to gain insight from industry, within the bounds of competitive nondisclosure and protection of proprietary data.

Risk Management Roles. The following responsibilities are recommended relative to the project risk management process.

Project Executive Officers / Milestone Decision Authorities

- Ensure project acquisition plans and strategies provide for risk management, and that identified risks and their root causes are considered in milestone decisions.
- In conjunction with the project contracting officer, ensure project contract(s) Statement of Objectives, Statements of Work, and Contract Deliverable Requirements Lists include provisions to support a defined project risk management plan and process.
- Periodically review project-level risks.

Project Managers.

• Establish, use, and maintain an integrated risk management process. PMs should ensure their integrated risk management process includes all disciplines required to support the life cycle of their system (e.g., systems safety, logistics, systems engineering, producibility, in-service support, contracts, test, earned value management, finance).

• Develop and maintain a project IMS that incorporates employer schedules and external Government activities in a single, integrated schedule. Project independent estimates of completion dates for major milestones and assess the probability of maintaining the baseline schedule. Conduct schedule risk analysis as needed and determine the potential impact to the project estimate and approved funding. Review the employer's schedule risk analysis. Analyze the employer's monthly IMS submissions, and monitor employer progress against risk mitigation activities.

• Jointly conduct IBRs with the employer team to reach mutual understanding of risks inherent in the employer's baseline plans. Conduct IBRs as necessary throughout the life of the project. The Project Managers' Guide to the Integrated Baseline Review Process provides details on conducting effective IBRs.

• Analyze earned value information contained in the CPR for identification of emerging risk items or worsening performance trends for known risk items. Assess realism of employer's projected estimate at completion and adequacy of corrective action plans.

• Synthesize and correlate the status of new and ongoing risk elements in the IMS, CPR, risk mitigation plans, technical status documentation, project status reviews, and other sources of project status.

• Establish a realistic schedule and funding baseline for the project as early as possible in the project, incorporating not only an acceptable level of risk, but adequate schedule and funding margins. Protect the project by budgeting to a conservative estimate with a high probability.

• Ensure the project has a defined RMP, and that risk assessments are conducted per that plan. Ensure the project RMP defines the required relationships with other risk related directives.

• Form a project RMB to include the PM/IPT Leader, Project Risk Management Coordinator, Chief or Lead Systems Engineer, project logistician, budget and financial manager, Prime Employer PM/Lead Systems Engineer, and other members relevant to the project strategy, phase, and risks.

• Approve appropriate risk mitigation strategies. Include operational users and other stakeholders in the formulation and acceptance of risk mitigation plans.

• Assign responsibility for risk mitigation activities and monitor progress through a formal tracking system.

• Report project risks to appropriate Project Executive Officer (PEO)/PM/Systems Commanders and user personnel prior to Milestone decisions, following significant risk changes, or as requested. Use the Risk Reporting Matrix documented in the project RMP to report project risks.

Integrated Product Team.

• Document and implement the RMP, and support the project RMB as required.

• Assess (identify and analyze) risks and their root causes using documented risk assessment criteria. An ongoing/continual risk assessment is highly recommended, and is useful during all phases of a project's life cycle. A tailored project risk assessment should be conducted for each of the applicable technical reviews and for each key project decision point.

• Report risks using the Risk Reporting Matrix documented in the project RMP to report project risks to appropriate PEO/PM/Systems Commander and user personnel.

• Recommend appropriate risk mitigation strategies for each identified root cause, and estimate funding requirements to implement risk mitigation plans. Be prepared to provide required risk mitigation support.

• Implement and obtain user acceptance of risk mitigation in accordance with project guidance from the RMB per the project RMP.

Risk Management Boards.

• Evaluate project risk assessments in accordance with the RMP.

• Evaluate and continually assess the project for new root causes, address the status of existing risks, and manage risk mitigation activities. The root causes to be identified and analyzed are those that jeopardize the achievement of significant project requirements, thresholds, or objectives. Like IPT composition, the RMB is made up of Government project management, industry/employer, and appropriate Government support personnel.

• Evaluate and prioritize project risks and appropriate risk mitigation strategies for each identified root cause, and estimate funding requirements to implement risk mitigation plans. Be prepared to request required risk mitigation support. Implement and obtain user acceptance of risk mitigation in accordance with project guidance per the project RMP.

• Report risk information, metrics, and trends, using the standard likelihood and consequence matrix format, to appropriate PEO/PM/Systems Commander and user personnel.

Support Activities.

• Provide the people, processes, and training to support project risk management activities.

- Designate SMEs and make them available to assist with risk assessments. Upon request of PMs or higher authority, Government support activities should provide personnel to conduct independent risk assessments on specific projects.

Employer.

- Develop an internal risk management project and work jointly with the government project office to develop an overall risk management project.
- Conduct risk identification and analysis during all phases of the project, including proposal development. Develop appropriate risk mitigation strategies and plans.
- Assess impacts of risk during proposal and baseline development. Use projected consequences of high probability risks to help establish the level of management reserve and schedule reserve.
- Jointly conduct IBRs with the Government team to reach mutual understanding of risks inherent in the project baseline plans.
- Conduct schedule risk analyses at key points during all phases of the project, including proposal development.
- Incorporate risk mitigation activities into IMS and project budgets as appropriate.
- Use IMS and EVM information (trends and metrics) to monitor and track newly identified risks and monitor progress against risk plans. Identify new risk items, and report status against risk mitigation plans to company management and the Government project office.
- Assess impact of identified performance, schedule and costs risks to estimate at completion, and include in the estimate as appropriate. Develop a range of estimates (best case, most likely, worst case).
- Synthesize and correlate the status of new and ongoing risk elements in the IMS, CPR, risk mitigation plans, technical status documentation, project status reviews, and other sources of project status.
- Assign responsibility for risk mitigation activities, and monitor progress through a formal tracking system.
- Once risks have been realized (100% probability) and turn into an issue, incorporate the issue into work planning documents, IMS, and earned value budgets, and ensure integration with ongoing work to minimize impacts.

Training. Getting the project team organized and trained to follow a disciplined, repeatable process for conducting a risk assessment (identification and analysis) is critical, since periodic assessments are needed to support major project decisions during the project life cycle. Experienced teams do not necessarily have to be extensively trained each time an assessment is performed, but a quick review of lessons learned from earlier assessments, combined with abbreviated versions of

these suggested steps, could avoid false starts.

The project's risk coordinator, or an outside expert, may train the IPTs, focusing on the project's RMP, risk strategy, definitions, suggested techniques, documentation, and reporting requirements.

A risk assessment training package for the full team (core team plus SMEs) is often very beneficial. This package typically includes the risk assessment process, analysis criteria, documentation requirements, team ground rules, and a project overview. Train the full team together in an integrated manner and the use of a facilitator may be useful.

Section 9

GLOSSARY

Accreditation
Certification of professional competence by a plenipotentiary organisation which gives the right to carry out certain activities.

Activity
1 An individual component of a Programme of Work.
2 The means through which inputs (resources) are converted to outputs (results).

Allocation
Funds set aside in the budget for a special project or kind of activity.

Applied research
An original investigation undertaken in order to acquire new knowledge and directed primarily towards a specific practical aim or objective.

Audit approach
Type of assessment of HR effectiveness that involves of customer satisfaction or key indicators (e.g., turnover rate, average days to fill a position) related to an HR functional area (e.g., recruiting, training).

Assets (funds, costs)
An item or property which is owned by a business or individual and has a monetary value.

Benchmark study
The initial measurement against which all subsequent measurements are compared.

Action plan
A sequenced and prioritized chronology of intent and commitment to be carried out and normally detailing the key activities involved.

Analytic approach
Type of assessment of HR effectiveness that involves determining the impact of, or the financial costs and benefits of, a program or practice.

Assessment centre
A process in which multiple rates evaluate employees' performance on a number of exercises.

Asset allocation
Dividing investment funds among markets to achieve diversification or maximum return.

Auditing
A process by which a competent, usually independent person/firm accumulates and evaluates evidence about an entity or unit for specified purposes (e.g. financial, safety, environmental, technological, etc.).

Basic skills
Reading, writing, and communication skills needed to understand the content of a training program.

Board
A committee with authority and ability to make decisions or strong recommendations.

Basic (Fundamental) research
Experimental or theoretical work undertaken primarily to acquire new knowledge of the underlying foundation of phenomena and observable facts, without any particular application or use in view.

Best practices
Techniques that agencies may use to help detect problems in managing systems (research, innovation, etc.). Best practices are practical techniques gained from experience that have been shown to produce best results.

Boston matrix
A framework for highlighting and analysing product development policy and associated cash flow implications in a firm, used by corporate planners in formulating business strategy.

BOT – Build-Operate-Transfer
System, in which a network is built by an investor (usually an operator) other than the national operator, is operated under certain conditions, and for a certain period, by the investor, and it is transferred to the state or the national operator at the end of the period.

Business angel
Individual investor or a group of individuals who provide finance for business start-ups. A source of private venture capital.

Business analysis
An analysis of the business situation surrounding a proposed project. Usually includes financial forecasts in terms of discounted cash flows, net present values or internal rates of returns.

Benchmarking
The practice whereby an organisation studies the 'best' production and marketing processes used by immediate competitors from other similar industries so as to identify possible ways to improve its own methods.

Bid
A formal binding proposal by a firm, institution or a consortium for services required by a contracting authority, including all necessary technical and financial information that the contracting authority will need to evaluate the offer.

Brand
A name, term, design, symbol, or any other feature that identifies one seller's good or service as distinct from those of other sellers. A brand may be given legal protection by the use of trademark or copyright.

Brainstorming
A technique for generating as many ideas as possible on a given subject, while suspending evaluation until all the ideas have been suggested; new concepts of a problem, in which members of a group express ideas as they think of them.

Budget
A predetermined plan (expressed in quantitative or financial terms) for a given future period. E.g. The cost anticipated at the start of a project.

Buyer's market
Market of a product with availability of the product greater than demand thus giving buying 'power' to the purchaser.

Business games
The method of management decisions in different production situations by playing on pre-defined rules.

Business incubator
An organisation (firm, association) established to provide support for entrepreneurs at the earliest stage of business and to help them implement their ideas into viable commercial products and to form productive business ventures. A business incubator can be established as: technology innovation centre, high technology incubator, small business incubator, etc.

Business process
A process of arranging and developing commercial activities, including manufacturing. A typical business process in a manufacturing firm includes:

Operational phases:
Product development, Customer acquisition, Customer requirements definition, Manufacturing, Integrated logistics, Order management, Post sales service.

Management phases:
Performance monitoring, Information management, Asset management, Human resource management, Planning and resource allocation.

CALS technology
Continuous Acquisition and Lifecycle Support - is a strategy of continuous increase of productivity through introduction of modern tools of information support of a product during its life-cycle.

Career
The pattern of work – related experiences that span the course of a person's life.

Business R&D
R&D performed in the business enterprise sector, regardless of the origin of funding.

Business plan
A document which justifies an application for finance and/or for internal planning requirements. Normally would contain summaries of past and projected profit and loss accounts, balance sheets and cash flows, as well as details of products and services, markets, future strategy, and profiles of the managers

CAD/CAM systems
An acronym for Computer Aided Design/Computer Aided Manufacturing. The use of computers in the design of new components or products and in the re-design of existing products. CAD can be employed to help in drawing a design for a part. CAM can directly control machines by using computers to impart operating instructions to numerically controlled machines and robots employed in production.

Capital employed (working capital)
The finance employed by the business. Seen from the funding side it is the shareholders funds plus long term liabilities. Seen from the asset side it is the fixed assets plus working capital.

Capital investment
A financial action influenced by a complex set of factors, such as: initial cost of the project, phasing of expenditure, associated working capital involved, estimated life of the investment, amount and timing of resulting income, effects on related operations of the company, risk and probability of obsolescence etc.

Case study
A popular method of teaching using an existing and known situation. A case is usually a short story outlining a typical situation faced by a business.

Centre of excellence
Centres of excellence are institutions, developed in many countries (universities, professional and research enters), that have reached outstanding results in one concrete fields of their activity areas, such as education, science, technology. Famous science schools are also viewed as centres of excellence.

Certification
A written testimony to certain facts. Used to satisfy regulatory bodies or customers that a person, item or organisation's capability, qualities, performance, etc. are up to specified standards.

Cluster analysis
A technique which groups objects into clusters containing the same or similar items.

Commercialisation of R&D
Commercialisation of research and development is mainly understood as activities aimed at developing the commercial use of completed research and developments.

Commercialisation of technology
Commercialisation of technology is understood as activities aimed at receiving profit from concrete technological developments and including mainly active marketing of the product.

Competence
The terms of reference of which - any organization, institution or person; range of issues in which the person has certain powers, knowledge, experience.

Closed economy
The economy, which has links with the outside world. An example of such a model economy can be a basic circular flow.

Circular economy
The essence of the circular economy lies in designing goods to facilitate disassembly and re-use, and structuring business models so manufacturers can reap rewards from collecting and refurbishing, remanufacturing, or redistributing products they make.

Cluster
A specific network of firms, knowledge-producing institutions (universities, research institutes), bridging institutions (consultancies) and customers interlinked for mutual benefit.

Co-financing
Activities funded by two or more organisations working in conjunction.

Copyright
Legal protection of an original work set down in a fixed form or medium of expression, e.g. texts, software, visual and audio materials. Copyright terms vary from country to country.

Competitive advantage
A set of factors that allow organisations to differentiate themselves from competitors. Defining of competitive advantages is one of the main elements of the process of commercialisation of R&D results.

Conflict
Any situation in which incompatible goals, attitudes, emotions, or behaviors lead to disagreement or opposition between two or more parties.

Consortium
A group of independent companies or financial organisations which agree to work together jointly on some project, each contributing some particular resource input or expertise.

Contractor
The firm, organisation or consortium to whom a contract is awarded.

Copyright online
The copyright applied to web content, just as it does to printed materials or content in other media.

Cost management
The function required to maintain effective financial control of the project through the processes of evaluating, budgeting, monitoring, analysing, forecasting and reporting the cost information.

Cross-subsidy
The financing of less profitable, or unprofitable services from the profit from other services, usually by means of unbalanced tariffs.

Directional matrix
A tool used to assist in formulating an organisation's strategic direction and 'positioning', e.g deciding on what markets and market segments the firm should operate. A Directional matrix juxtaposes 'market attractiveness' (growth rate, profitability, structure etc.) alongside the firm's corporate strengths (financial resources, core skills, product uniqueness) so as to maximise the firm's profit potential.

Discount
A deduction from the published or normal list price of a product by a supplier to a customer or buyer.

Contract research organisation
A commercial research organisation which carries out research for its clients on the basis of specific contracts.

Codified knowledge
A knowledge fixed (codified) in patents, specialised press and scientific journals.

Creativity
A process influenced by individual and organizational factors those results in the production of novel and useful ideas, products, or both.

Creative accounting
The use of discretion in the application of accounting principles such as to report profit and asset figures which are flattering to the company.

Date of patent
The effective date of the patent and the date of printing of notice of the patent grant in an official publication.

Depreciation
The process of allocating (spreading) the historic cost of an asset over a number of accounting periods which correspond with the asset's estimated life. Depreciation on each individual asset or group of similar assets is computed separately, and the total amount accumulated is a function of the original cost, age and expected useful life of the asset. Land is not depreciated.

Discounting costs
The process of bringing different periods costs one point in time.

Derivative product
A new product based on changes to an existing product that modifies, refines or improves some product features without affecting the basic product architecture or platform.

Discount rate
The interest rate at which future cash inflows and cash outflows associated with a investment project are discounted in order to allow for the timing of these cash flows.

Deliverable
Any measurable, tangible, verifiable item that must be produced to complete the required activity Often used more narrowly in reference to an external deliverable, which is a deliverable that is subject to approval by the project sponsor or customer.

Economic performance
One of the main indicators of the results of profit oriented activities.

Employee - oriented leader
Emphasizing interpersonal relations, taking a personal interest in the needs of employees and accepting individual differences among members.

Evaluation of scientific research
Measures to evaluate the accountability and efficiency of government-funded and other research for purposes of optimising research allocation, structuring, funding, etc.

Entrepreneur
A person who undertakes the risks of establishing and running a new business.

Direct project costs
The costs directly attributable to a project, including all personnel, goods and/or services together with all their associated costs, but not including indirect project costs, such as any overhead and office costs incurred in support of the project.

Dumping
Selling at a price under breakeven cost in order to get rid of unwanted goods or to obtain an access to a market. Normally is applied on inter - country basis.

Economic growth
An increase in the total real output of goods and services in an economy over time. Usually measured in terms of an increase in Gross Domestic Product (GDP) over time or an increase in GDP per head of population to reflect its impact on living standards over time.

Electronic commerce
The process of doing business on the internet.

Exploitable result (of R&D)
A result which is available and has at least one potential application normally either financial or economic.

Exclusive license
An agreement granting to one party exclusive rights under an issued patent, with the licensor giving up by the terms of the license the right to offer and give a license to any other party.

Experimental research
An integral part of the notion "basic research", i.e. experimental activity directed to acquisition of a new knowledge.

Experimental development
A systematic work, drawing on existing knowledge gained from research and/or practical experience that is directed to producing new materials, products or devices, to installing new processes, systems and services, or to improving substantially those already produced or installed.

Factor analysis
A technique which examines the relationships between a large number of variables and looks to see if the information contained in them can be summarised in a smaller set of variables.

Feasibility study report
A report of a study undertaken with the purpose to determine if an activity (project) is feasible, that is to say if it can be carried out, and whether it is cost-effective. It usually contains description of targets, milestones, input and output data of the activity as well as full financial evaluations.

Future Root Cause
The reason, which, if eliminated or corrected, would prevent a potential consequence from occurring. It is the most basic reason for the presence of a risk.

Free market
The market, when goods and services are supplied by a large number of suppliers to a large number of consumers, without any limitation on the numbers and consumption, and when prices are determined exclusively by supply and demand.

FDI
Foreign direct investment. Foreign investment is defined as "direct" if the foreign investor holds at least 10% of ordinary shares or voting rights in the firm in which the investment is made.

Field testing
Product testing with potential users from the target market.

Flextime
Time management system, in which workers define their own hours of work, usually specifies the period of time during which the workplace is the whole team.

Framework agreement
An agreement which sets out the broad line of cooperation. It may be followed by more detailed agreements on specific issues.

Framework programme
Usually a framework programme is an oriented programme of action establishing general conditions and activity areas and including special programmes and projects.

Franchise
The granting by one organisation to another organisation (exclusive) or a number of companies (non-exclusive) by contractual arrangement of the rights to supply its products or the use of it's name or trademarks.

Gantt Chart
A graphic display of activity durations. Activities are listed with other tabular information on the left side with time intervals over the bars. Activity durations are shown in the form of horizontal bars and have inter-linked duration parameters. Gantt, Henry - the inventor of the Gantt Chart.

Goodwill
The notional value of business relations firm "price" accumulated intangible assets of the company (prestige brands, experience, business connections and steady customer base). Monetary value of anticipated future excess profitability of the firm than the average profitability of similar companies. Capital invisible, invisible assets (the difference between the price of the whole enterprise and its real cost of capital)

Grant
An additional target oriented fund resource made available to finance activities and projects (for example, research ones). Grants come from a private or international organisation as a voluntary gratuitous and irrevocable contributions.

Implicit (imputed) costs
The opportunity cost to an organisation of using resources owned by the organisation itself to produce its output. Accurate measures of costs must impute charges based upon the current market rates for the resources used.

Innovation
The word "innovation" can have different meanings in different contexts. Often it is used to indicate the task of bringing inventions, new ideas, methods or devices and processes of creating new products and technologies, including managerial ones to market. Most widely used for technology, individual processes, management, financial, monetary improvements, and ways to provide these

Gross margin (Profit margin)
Difference between the selling price of a product and its production cost and selling cost The size of the profit margin is measured by the profit margin ratio which is a measure of firm’s profit margins which expresses the firm’s profits as a percentage of its sales revenue. Profit margins have a significant impact on a firm's Return on Capital Employed.

High-technology product
A product the main feature of which is incorporation of a high degree of technological sophistication.

Indivisibilities
The physical inability or economic inappropriateness of running machinery or other equipment at below its optimal operational capacity. As a result equipment would be underutilized and the average unit cost would be greater than if the equipment were optimally employed.

Innovation centre
Used as a support infrastructure to increase the awareness of innovation in firms and especially in SMEs. It is oriented on supporting and promoting innovation projects and acts as a conduit by which both indigenous and external producers and buyers of innovation may be able to communicate. It is usually established in the framework of national or regional innovation development programs and uses privileges and funding defined by the programs.

Infrastructure
A shared facility to service this or that kind of activities. E.g. the investment by central or local government in railways, roads, airports, schools, universities hospitals etc. to facilitate the improvement of industrial and commercial performances by their use.

Innovation climate index
A matrix indicator used to establish whether or not the company is likely to foster innovation.

Intangible investment (investment in knowledge)
Investment in R&D, software, training, personnel.

Innovation outputs (general)
General innovation outputs of a firm (enterprise) are its economic performance results during a certain period of time: sales, exports, employees. Though evaluation of innovation itself in the first turn involves analysis of new products, processes or services.

Innovative firm
A firm which introduced at least one technologically new or improved product/process during a certain period of time.

Invention
A new and useful process, machine, article of manufacture, or composition of matter, or new or useful improvement upon them.

Invoice
A contractor's bill or written request for payment under the contract for supplies delivered or services performed.

Infringement of a patent
Using the invention described in a claim of a valid patent without license or consent of the owner of the patent rights.

Innovation indicators
Indicators used for statistical evaluations of innovation activities.

Innovation activities
Innovation activities are all those scientific, technological, organisational, financial and commercial steps, including investment in new knowledge, which actually, or are intended to, lead to the implementation of technologically new or improved products or processes.

Intellectual property
Intellectual property - the product of intellectual creative work. Intellectual property is a collective term which includes rights relating to literature, art, and scientific activities, actors' activities, video- and audio recordings, radio- and TV-broadcasting (copyright), as well as to scientific discoveries, inventions and other forms of industrial property.

Innovation project
An organisational form of innovative activities with specified precise definition of objectives, tasks, inputs, activities, necessary resources, methods of management and expected results.

Intranet
A closed or non public network using internet technology to deliver information within a company or organisation.

ISDN
Integrated Services Digital Network. A telecommunications network that allows for digital voice, video, and data transmissions. ISDN replaces the slow and inefficient analog telephone system.

Key (strategic) technologies
A technology is considered strategic (a key technology) if it has a strong potential for creating opportunities that can be profitably exploited across the spectrum of business and industry. By definition key technologies have a national or international dimension.

Knowledge flows
The main complex parameter of National Innovation Systems, describing flows of knowledge within and between National Innovation Systems in different forms: trade in capital goods, technology transfer, personnel mobility, trade in patents and licenses, publications, transfer of knowledge in the process of training.

Lead investor
Venture capitalist or other deal maker with the largest share in the syndicated investment. He usually initiates the deal, and takes a hands on role on behalf of the other players.

Leading impact on productivity and quality
Providing high performance and quality by management as part of the management process requires the following conditions: 1. The Company's policy is built on trust. 2. Awareness among employees and transparency

Licensee
The party that takes the license.

Management by objectives (MBO)
A goal-setting program based on interaction and negotiation between employees and managers.

Kick off meeting
Ideally, a workshop type meeting in which the principle stakeholders and participants in the project are briefed on the goals and objectives of the project, how it will be organised, etc. and are then able to contribute to its planning, assignment of responsibilities, target dates, etc.

Knowledge-based economy
An expression coined to describe trends in the most advanced economies towards greater dependence on knowledge, information and high skill levels, and an increasing need for ready access to all of these.

Know-how
Knowledge and experience necessary to do things, contrasted with general information.

Leadership
The ability to influence a group toward the achievement of goals. Leaders can emerge from within a group as well as by formal appointment to lead a group.

Learning organization
An organization whose employees are continuously attempting to learn new things and apply what they learn to improve product or service quality

License
A contract agreement defining how another party may use an invention or product.

Licensor
The party that gives or sells the license.

Margin
The difference between selling price and cost price.

Management value added
Business value added minus shareholder value added minus direct operational and management costs. Allows the calculation of what managers are worth, average 50%.

Market leader
Supplier with the largest market share (normally sets the standards by which others are measured).

Market conditions
Characteristics of the market into which a new product will be placed, including the number of competing products, level of competitiveness, and growth rate.

Market price
The price that customer expects to pay for product or service.

Market testing
The product development stage when the new product and its marketing plan are tested together.

Monitoring
The action of regularly reviewing an ongoing project or other activity, carried out to measure the progress towards the achievement of defined objectives.

National innovation system
Set of distinct institutions which jointly and individually contribute to the development and diffusion of new technologies and which provides the framework within which governments form and implement policies to influence the innovation process.

Networking
Formal or informal links between enterprises, including subcontracting relationships, that facilitate economic specialisation of firms as well as superior access to information.

Marginal costing
A system of product costing which assigns variable materials and labour costs to units of product manufactured but which does not assign fixed overheads costs to products. With marginal costing, work in progress and fixed overhead costs are charged as a single block against revenues in the period when they are incurred.

Market development
A business strategy aimed at increasing sales of existing products by finding new markets for those products.

Market share
A company's sales in a product area as a percent of the total market sales in that area.

Motivation
The process of arousing and sustaining goal-directed behavior.

Mechatronics
Synergistic combination of precision mechanical engineering, electronic control, and systems thinking in the design of products and processes.

Network analysis
Commonly known as Programme Evaluation and Review Technique (P.E.R.T.). A method of planning, scheduling, and controlling projects involving interrelated but distinct elements of work or activities when their interrelationships are depicted in a network of arrowed links representing activities. PERT charts are often applied to the launch of new products and are used to identify problem areas where bottlenecks may occur and where additional resources may be needed.

National priorities in S&T
Scientific and technological development priority areas adopted and approved by a Decree of the Government.

New technologies
Current applications of knowledge, procedures, and equipment that have not been previously used. Usually involves replacing human labor with equipment, information processing, or some combination of the two.

Non exclusive license
A grant under a patent with reservation by the licensor to make a similar grant to others.

Non-innovation changes in products or processes
Those changes which:
- are insignificant, minor or which do not involve a sufficient degree of novelty;
- make "other creative improvements" where the novelty does not concern the use or objective performance characteristics of the products but rather their aesthetic or other subjective qualities.

Organisational innovation
An innovation on the firm level which includes:
- introduction of significantly changed organisational structures;
- implementation of advanced management techniques;
- implementation of new or substantially changed corporate strategic orientations.

Consequence
The outcome of a future occurrence expressed qualitatively or quantitatively, being a loss, injury, disadvantage or gain.

National research capacity
An indicator of scientific and technological development of a country describing human resources, fixed assets, system of funding and outputs of the science system.

Non disclosure agreement
An agreement which allows a patent attorney to disclose an invention to prospective licensees under a special "confidential disclosure agreement" before a patent application is even filed. The "NDAs" are effective because they are inexpensive to enforce. Companies often feel much safer infringing on a patent than they do breaching a NDA.

Novelty
A requirement for patentability. If an invention has been used or was known to others it is probably no longer novel and therefore not eligible for patent protection.

Opportunity cost
A comparator against which to measure the return on the use of resources in some particular activity, as compared to the return which the same resources could earn in some other alternative activity.

Overhead
Any cost that is not directly associated with a product. That is all costs other than direct materials cost and direct labour cost. Factory overheads include the cost of indirect materials and indirect labour along with other production expenses like factory heat, light and power, and depreciation of plant and machinery.

Omnibus panel
A fixed sample of respondents measured on different variables over a period of time.

Organization-based model
A career development model suggesting that careers proceed through a series of stages and that career development involves employees' learning to perform certain activities.

Patent life
Period of validity of a patent (time period varies from country to country but a minimum of 20 years for all WTO members).

Patent maintenance
The patent fees due at needed to keep patent in force for its full life.

Pilot production
The initial limited-quantity production used to confirm readiness for large quantity production.

Payback period
A criterion used in investment appraisal to evaluate the desirability of an investment project. Calculations involve measuring the cash flows associated with a project and indicate how long it takes for an investment to generate sufficient cash to recover in full its original capital outlay.

Product
A term used to describe all goods and services sold. Products are bundles of attributes (features, functions, benefits and uses) and can be either tangible as in the case of physical goods, or intangibles such as those associated with service benefits or a combination of the two.

Option agreement
A contractual right which allows the holder to decide on implementing detailed future activities normally after achievement of pre-set targets.

Patent
A grant of ownership rights by a Government to a person or business in respect of an invention giving the owner of the patent the right of exclusive making, using, offering for sale, or selling the invention.

Panel
A group of respondents participating in a study over a period of time (usually for market research purposes).

Patentability study
An examination of the publications and patents to determine the probability of granting a patent for the invention.

Pilot project
A project which is implemented on an experimental or demonstration basis.

Planned – investment schedule
Graph, which shows the ratio between the total number of investments planned and interest rate.

Portfolio
A group of projects or other items that have been or are being worked or marketed at the same time.

Product development
A business strategy aimed at increasing sales by developing new products which can be sold to its existing markets or new products which open new markets.

Production - oriented leader
One who emphasizes technical or task aspects of the job.

Pre-competitive R&D
Research and development at the stage when the results do not have concrete commercial value (these are mainly fundamental research and partly applied research at the very initial stage).

Product manager
A person assigned responsible for overseeing all activities that concern a particular product. Sometimes called a brand manager.

Project planning
Project planning is a question of creating a balance between costs, duration and quality of the project, including as well evaluation criteria and procedures. The plan should document the targets of the project and the baseline as a reference for all participants to co-ordinate the project state and their efforts. When a project has reached a baseline, intermediate products are in a well defined state. Checkpoints are those points in time when it has been decided to assess whether a baseline has been reached. A phase is those set of activities that take place between checkpoints.

R&D
Research and Development.

R&D capital depreciation rate
The rate at which research and development expenditures in capital assets (equipment and buildings) can be depreciated for tax purposes.

R&D fiscal privileges
One of important components of the State science and technology policy aimed at promoting industrial research, development and innovation at the expense of internal resources of enterprises.

Premium price
The price above normal market price reflecting some advantage of the product or supplier.

Process map
A time workflow diagram which shows participants and tasks of every stage.

Project manager
A person assigned responsible for overseeing all activities within a particular project.

Project result
The term "Project result" is usually used in a wide sense to cover the full spectrum of project outputs. It includes any marketable or transferable product, process, service, standard, know-how, methodology, network experience, result of clinical trial, software, etc.

Qualitative goals of the company
Measures to protect the environment, employment in countries where the company manufactures and sells its products by offering citizens of these countries on foreign enterprises. Support for educational, sports and other actions of governments in the territory of which the firm operates.

Recruitment
The process of seeking applicants for potential employment.

R&D depreciation rate
The rate at which non-capital research and development expenditures can be depreciated for tax purposes.

Regulatory framework
All laws, decrees, resolutions, statutes, etc., that regulate certain activities.

Retirement
Leaving a job and work role and making a transition into life without work.

Research personnel mobility
One of important mechanisms of knowledge transfer and indicator for mapping key linkages in national innovation systems.

Risk Mitigation Planning
The activity that identifies, evaluates, and selects options to set risk at acceptable levels given project constraints and objectives. It includes the specifics of what should be done, when it should be accomplished, who is responsible, and the funding required to implement the risk mitigation plan.

Risk Analysis
The activity of examining each identified risk to refine the description of the risk, isolate the cause, and determine the effects and aiding in setting risk mitigation priorities. It refines each risk in terms of its likelihood, its consequence, and its relationship to other risk areas or processes.

Risk Mitigation Plan Implementation
The activity of executing the risk mitigation plan to ensure successful risk mitigation occurs. It determines what planning, budget, and requirements and contractual changes are needed, provides a coordination vehicle with management and other stakeholders, directs the teams to execute the defined and approved risk mitigation plans, outlines the risk reporting requirements for on-going monitoring, and documents the change history.

Risk Management
An overarching process that encompasses identification, analysis, mitigation planning, mitigation plan implementation, and tracking of future root causes and their consequence.

Researcher
A professional engaged in the conception or creation of new knowledge, products, processes, methods and systems, and in managing the projects concerned.

Risk
A measure of future uncertainties in achieving project performance goals within defined cost and schedule constraints. It has three components: a future root cause, a likelihood assessed at the present time of that future root cause occurring, and the consequence of that future occurrence.

Risk Identification
The activity that examines each element of the project to identify associated future root causes, begin their documentation, and set the stage for their successful management. Risk identification begins as early as possible in successful projects and continues throughout the life of the project.

Risk Tracking
The activity of systematically tracking and evaluating the performance of risk mitigation actions against established metrics throughout the acquisition process and develops further risk mitigation options or executes risk mitigation plans, as appropriate. It feeds information back into the other risk management activities of identification, analysis, mitigation planning, and mitigation plan implementation.

Issue
A problem or consequence which has occurred due to the realization of a root cause. A current issue was likely a risk in the past that was ignored or not successfully mitigated.

Risk Management Planning
The activity of developing and documenting an organized, comprehensive, and interactive strategy and methods for identifying and tracking future root causes, developing risk-mitigation plans, performing continuous risk assessments to determine how risks and their root causes have changed, and assigning adequate resources.

Seller's market
Market of a product where demand exceeds availability of the product.

S&T innovation
Scientific and technological innovation may be considered as the transformation of a scientific idea into a new or improved product introduced on the market or a new or improved operational process used in industry or into a new approach to a social service.

SMEs
Small and Medium-sized enterprises.

Science park
An infrastructure element needed to promote R&D results on a regional basis. Multi-national corporations, local companies and research institutes are attracted to science parks because of their entrepreneurial and conducive environment and available business support facilities. There are inter-disciplinary and mono-disciplinary science parks (for example, biomedical). One of recent trends in science parks' development is their actual transformation in science and technology parks.

Share of equipment
One of the forms of arranging research aimed at reducing their cost.

ROCE (return on capital employed)
An accounting measure of a firms profitability which expresses the firm's profits for an accounting period as a percentage of its period-end capital employed. ROCE provides a key measure of management performance in earning profits from the assets which they control.

Royalty
Payment to a licensor or inventor for the use of an intellectual property right or physical property right.

Science-intensive (knowledge-intensive)
Science intensity is an indicator which reflects:
- proportion between S&T and production activities per unit of product;
- share of the number of researchers within the total number of employed persons (in industry or at an enterprise).

Scientific and technological (S&T) activities
The concept of STA has been developed by UNESCO. According to its "Recommendation Concerning the International Standardisation of Statistics on Science and Technology", scientific and technological activities comprise: systematic activities which are closely concerned with the generation, advancement, dissemination and application of scientific and technical knowledge in all fields of science and technology. These include such activities as R&D, scientific and technical education and training and the scientific and technological services".

Spill over effect
Transfer of knowledge created within an enterprise/organisation to be used by other enterprises, usually within a network or a cluster.

Spin-off effect
Transfer of knowledge created within a research organisation/university to be further commercialised in an innovation process. Often the spin-off effect leads to establishment of a new venture by researchers themselves. In the western press such enterprises are called "spin-off firms".

Sunk costs
The cost of durable and specific assets which cannot be used for other purposes or easily be resold.

Start-up capital
Financial support of a firm establishment and operation at the initial stage of its work.

SWOT analysis
A framework for identifying the internal strengths (S) and weaknesses (W) of an economic entity and the external opportunities (O) open to it and the threats(T) it faces, which can be used by corporate planners in formulating the entity's competitive strategy in individual markets and its overall business strategy.

Task force
A team of experts tasked to investigate a problem and to develop and implement the necessary corrective action.

Technical assistance
Provision of experts, consultants, trainers, advisers, etc. for the transfer of know-how and skills for the establishment, development and strengthening of entities in transitional economies.

Spin-off firm
A commercial firm established at a research organisation or separately by a group of researchers to commercialise R&D results.

Stage-gate product development process
A widely-employed form of managing product development that divides the effort into distinct time- sequenced stages separated by management decision gates. Multifunctional project teams must successfully complete a prescribed set of related cross-functional tasks in each stage prior to obtaining management approval to proceed to the next stage of product development.

Start-up consulting
Consulting for creation of a firm and for follow-up work normally during the first 3 years.

Tacit knowledge
The knowledge, experience, common sense, the mental model which is not written down: as opposed to measured, objective knowledge which is specific and written down.

Tangible assets
An asset which has physical existence (e.g. buildings and equipment).

Technological consulting
Consulting on use of technologies for concrete purposes, for example use of information technologies, or on any other technological problems.

Technological auditing
A tool of analysis and evaluation of research or technological development results aimed at assessing commercialisation perspectives.

Technological innovation
An innovation which comprises new products and processes or significant technological changes of products and processes, and which is introduced on the market.

Technological product innovation
An innovation which takes two broad forms:
- technologically new products or
- technologically improved products.

Technological trade
There are four main categories of the trade in technologies: transfer of techniques (through patents, licences and know-how); transfer of designs, trade-marks and patterns; services with a technical content (including technical assistance); industrial R&D.

Technologically new product
A product technological characteristics or intended uses of which differ significantly from those of previously produced products.

Technology balance of payments
An indicator which measures international transfers of technology (licences, patents, know-how and research, technical assistance) and reflects a country's ability to sell its technology abroad and its use of foreign technologies.

Technology licensing
A formal and legally enforceable transfer of technology in a form of a written grant of rights by one party to another party for specific purposes. Technology may be licensed to an established company, a new company or another academic institution.

Technological process innovation
Adoption of technologically new or significantly improved production methods, including methods of product delivery (i.e. changes in delivery or/and production organisation).

Technologically improved product
An existing product performance of which has been significantly enhanced or upgraded.

Technology
Often technology is considered as any application of scientific results to practical needs. The OECD defines technology more narrowly: as the first application of scientific results in a new way with commercial purposes. In general the meaning of the word technology is much wider. While problems are usually organisational in nature the solutions are increasingly provided in the form of technology (organisational or management technologies).

Technology cluster
A group of technology fields that are all directed toward a specific application area.

Technology diffusion
One of the guidelines of the State science and technology policy aimed at enhancing the technological level of the economy.

Technology transfer
Diffusion of technical know-how and expertise concerning processes, methods of manufacture and innovative products across industries, within an industry, or, in the international context, from country to country.

Technology field
A group of technologies that have common or similar functions, production methods or products, or operate together as a system.

Technopark (technology park)
Institutionally registered site designed to support high-tech business, usually in a certain area of activities. As a rule, a technopark provides a set of services: corporate offices, R & D, assembly, warehouse, and light manufacturing in separate buildings, etc.Other names of a technopark: industrial park, high- tech scientific and business park, science and technology park, technology village, etc.

TPP innovation
Technological product and process innovation activities are those scientific, technological, organisational, financial and commercial steps which lead to the implementation of new or significantly improved products and processes.

Unpatentability
The case when an invention is not meeting the criteria and definitions required for a new patent or involving sufficient departure from prior art.

Virtual laboratory
A new type of arranging R&D involving wide use of modern information technologies (e.g. Internet) for implementing interaction of members of the research team.

WIPO
World Intellectual Property Organisation.

WTO
World Trade Organisation.

Trademark
A symbol, design, word, letter or device protected by law and used to distinguish a product or products from those of competitors.

Terms of reference
A Contracting Authority's precise definition of objectives, tasks, requirements, inputs, provided services and equipment, activities, necessary resources, methods of management, final results, forms of reporting for a project or other activity to be implemented.

TQM technology
Total quality management - unified methodological approaches to quality management.

Technopole
A term used in Europe to mean the same as "Science Park".

Twin institutions
Institutions that established special partnership relations. Partnership agreements may foresee a variety of types of cooperation.

Venture capital
A specific type of capital developed to fund high-risk projects. Venture capital is usually invested in new firms that are not yet quoted on the stock market. Venture capital by definition is a share capital invested by professional companies that participate then in managing emerging, developing or changing private firms, demonstrating high growth capabilities. In the process of venture funding one aspect should be noted: long - or medium-term growth of the firm's value, which should lead to the growth of the investor's share.

QUESTIONS FOR SELF-ESTIMATION

1 For the implementation of the Ukrainian innovation potential state is enough to remove barriers to business. Form your opinion on this?
2 Describe the direction of stimulating innovation activity.
3 Give a detailed definition of "innovation process" including those aspects that it involves.
4 Identify key: economic, political, legal and psychological barriers and leverage innovation. Provide the description of their.
5 In your opinion, who is the innovation manager. Identify place and role innovation manager at the company.
6 What motivates people engage in entrepreneurial activity?
7 Features of shots of innovative enterprise.
8 Essence, functions and management methods by a personnel in innovative enterprises.
9 Principles and stages of forming of collective of innovative enterprise.
10 Management features by the personnel of innovative enterprise.
11 Innovative methods of найма of personnel.
12 Basic stages of adaptation of innovative-active personnel.
13 Groups of indexes for the estimation of success of work on adaptation.
14 Basic stages of estimation of innovative activity of personnel.
15 System of indexes of estimation of innovative activity of personnel.
16 Criteria of estimation of innovative activity.
17 Essence and basic types of motivation of innovative activity of personnel.
18 Basic directions of activation of innovative activity of personnel.
19 Passing ahead development of professional competenses.
20 Forming educating on the basis of competence model of manager.
21 Developing educating on the basis of business games.
22 Basic functions of business games. Use of interactive seminars.
23 Directions of skilled safety of innovative enterprise.
24 Types of threats from the side of personnel.
25 Signs of secret-service introduction.
26 Internal and external threats.
27 Basic ingredients of innovative culture.
28 Innovative coefficients and his use for the estimation of innovative culture.
29 Based goals generating business ideas?

30 What are the main source of business ideas? Describe them.
31 The essence of creative management.
32 What is the essence of creative management and what are the basic components of creativity?
33 Give the basic definitions of creativity. Consider the evolution of creativity in business.
34 Explain the possibility of increasing the efficiency of business activities on the basis of management intellectual activity of the staff.
35 Highlight the main reasons for the influence of innovative activity of employees on the level of competitiveness of the organization?
36 What are the main principles of intellectual organization.
37 What are the main features of creativity.
38 Describe the personality traits of creative person.
39 Give a comparative description of different definitions of concept "creativity".
40 What personal approaches to the development of creativity.
41 Describe the most widespread techniques of creative thinking and generate innovation.
42 Give examples of the modern creative projects.
43 What is the intellectual property content?
44 Socio-economic prerequisites of the legal institute of intellectual property.
45 Industrial property right characteristics.
46 Distinctive features of the intellectual property market.
47 Identify the content, features and principles of planning innovative projects.
48 What, in your opinion, can be attributed to the objects of innovation activities.
49 What section of the business plan important for investors?
50 Objectives valuation of intangible assets and intellectual property.
51 Structure of intangible assets and intellectual property.
52 Types of the cost used in the evaluation of intellectual property.
53 What kind of products can be attributed to the high technology? What is the definition of "high-tech products"?
54 When an idea, invention, R&D, proposal become innovation?
55 What is the role of intellectual property in innovative activity of the enterprise?
56 What are the advantages that provide the inventor and patent holder obtained patents for invention?
57 Commercialization of intellectual property: the main objectives and methods. Intellectual property as a commodity.
58 The market value of intellectual property. Specificity of the cost estimation of intellectual property.

59 The essence of the value of a systematic approach to economic activity in modern conditions.
60 What are the the system properties, which must have an object to be difined as a system.
61 How is the system approach in relation to the economics of innovation?
62 How is the system approach in the development of innovative activity of the enterprises?
63 What are the methods of risk management exist? What risk management procedures they correspond?
64 Describe the basic risk management techniques.
65 In what appears the systemic nature of risk management?
66 What are the main objectives of the risk management system?
67 As risk management related to the overall management of the company?
68 What external and internal constraints of risk management systems exist?
69 Describe the main roles and responsibilities within the risk management system?

SUGGESTED READING

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CONTENT

НАВЧАЛЬНЕ ВИДАННЯ

САВЧЕНКО Ольга Ігорівна
ПОСОХОВ Ігор Михайлович
СОКОЛОВ Андрій Васильович
НЕСТЕРЕНКО Роман Олександрович
ТАВХЕЛІДЗЕ Автанділ
ХАКОБЯН Едуард
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