

МИНИСТЕРСТВО ОБРАЗОВАНИЯ И НАУКИ
РОССИЙСКОЙ ФЕДЕРАЦИИ

Нижегородский государственный университет им. Н.И. Лобачевского

N.G. Kopasovskaya

**INNOVATIVE ENTREPRENEURSHIP:
RUSSIAN AND INTERNATIONAL EXPERIENCE**

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Ответственный за выпуск:
Председатель методической комиссии ФнФ ННГУ
Никулина Н.Н.

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Зав. кафедрой доцент Суходоева Л.Ф.

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INTRODUCTION

Successful innovation is one of the main components of competitiveness. And the importance of innovation to market success is constantly increasing. Innovation is important for certain enterprises, innovation is important for industries, regions and countries.

That is why the study of the features of the innovation process and management are important. Innovation and innovation processes of interest to a wide audience. These issues concern to society and the state, engineers and economists, manufacturers and consumers. We can see that special sections of science appear, such as innovation statistic, innovation management, etc. The government provides tax incentives for innovative enterprises and sends a lot of money on the development of the innovation sphere. Manufacturers are trying to identify and use innovative ideas ahead of its competitors.

Main objectives of the course are to:

- show the importance and significance of innovation for the successful development of the company and the country;
- identify the basic trends in the development of innovative entrepreneurship;
- characterize the modern methods of innovative management;
- study the issues of state influence on the effectiveness of innovation processes.

SCHEDULE

№	Name of unit	Number of hours		
		Total	Lecture	Seminar
1.	Innovation entrepreneurship: basic concepts	4	2	2
2.	Scientific and technological forecasting	4	2	2
3.	Innovative potential and innovative climate	4	2	2
4.	Innovative business strategy	4	2	2
5.	Innovative infrastructure	4	2	2
6	Funding for innovation	4	2	2
7.	Intellectual property management	4	2	2
8.	Government regulation of innovation	4	2	2
	Total	32	16	16

Unit 1. Innovation entrepreneurship: basic concepts

The learning outcomes

On completing Unit 1, students should be able to:

- give definition for the terms: innovation, diffusion of innovation, innovation activity;
- understand the difference between types of innovation;
- explain the role of innovation in modern economy.

Activity 1.1

You can see (Figure 1.1, source “The Oslo Manual”) different types of innovation and changes that are not innovations. Find examples for each cell in this schema.

			INNOVATION			<i>Not innovation</i>
			Maximum	Intermediate	Minimum	
			New to the world	(a)	New to the firm	
INNOVATION	Technologically new	Product				Already in firm
		Production process				
		Delivery process				
	Significantly technologically improved	Product				
		Production process				
		Delivery process				
Other innovation	New or improved	Purely organisation				
<i>Not innovation</i>	No significant change, change without novelty, or other creative improvements	Product				
		Production process				
		Delivery process				
		Purely organisation				

TPP innovation Other innovation Not innovation

Figure 1.1. Type and degree of novelty and the definition of innovations (from *The Oslo Manual*).

Activity 1.2

Innovations may be spread from the innovator to other companies, industries, areas. This is a process of diffusion of innovations. As an indicator of diffusion we can use a Penetration Rate. In the Table 1.1 you can see the Internet Penetration Rates i.e. the number of Internet users over the population, in percentage.

Table 1.1 – Internet Penetration Rate (World Average), %

Year	Rate	Year	Rate
1995	0,4	2004	12,7
1996	0,9	2005	15,7
1997	1,7	2006	16,7
1998	3,6	2007	20,0
1999	4,1	2008	23,5
2000	5,8	2009	26,6
2001	8,6	2010	28,8
2002	9,4	2011	32,7
2003	11,1		

www.internetworldstats.com

Plot the curve describing the dynamics of change in the Internet Penetration Rate. What type of trend line is the most appropriate in this case (use Excel)? Compare the resulting trend with a diffusion curve. What can you say about the prospects of Internet penetration in the world (on average)?

Table 1.2 contains data on the Internet Penetration Rates for USA and India. Plot the similar curves and the trend lines for each of these countries. Compare the result with the world curve. What can you say about the prospects of Internet penetration in countries similar USA, in countries similar India?

Table 1.2 - Internet Penetration Rate, %

Year	USA	India
2000	44,1	0,5
2001	50,0	0,7
2002	58,0	1,6
2003	59,2	2,1
2004	68,8	3,6
2005	68,1	4,5
2006	No data	3,6
2007	70,2	3,7
2008	72,5	No data
2009	74,1	7,0
2010	77,3	8,5
2011	78,3	10,2

www.internetworldstats.com

Activity 1.3

Read the Text 1 and the Text 2. See Figure 1.2.

Text 1

“Mothers look out for your children! Artisans, mechanics, citizens! When your live your family in health, must your be hurried home to mourn a dreadful causality! Philadelphians, your rights are being invaded! Regardless of your interests, or the lives of your little ones. The Camden and Amboy, with the assistance of other companies without a charter, and in violation of law, as descried by your courts, are laying in locomotive Rail Road! Through your most beautiful streets, to the ruin of your trade, annihilation of your rights, and regardless of your prosperity and comfort. Will your permit this or do your consent to be a suburb of New York!!! Rails are now being laid on Broad Street to connect the Trenton Rail Road with the Wilmington and Baltimore road, under the pretense of constructing a City Passenger Railway from the Navy Yard to Fairmount!!! This is done under the auspices of the Camden and Amboy Monopoly! Rally people in the majesty of your strength and forbid this outrage!”



Figure 1.2. The Anti- Rail Road Poster. National Archives and Records Administration. Records of the Bureau of the Public Roads.

Text 2

Shakhty (mine in Russian) is a town in Rostov Oblast (province), Russia. This is the place of coal mining. In the 19th century coal transported from the mine to the dock, using oxen. Here it was loaded onto barges and transported to the Sea of Azov. This method of delivery was very uncomfortable. A lot of coal was lost. In 1861 there was started the construction of the railroad.

In 1862 the inhabitants of the stanitsa (a village inside Cossack host) Nizhne Novochoerkasskaya (near Shakhty) assembled gathering and signed a document in which were claims to the railroad:

- Rail road cuts the stanitsa from the river navigable;
 - Rail road cuts the fields and pastures from the water (on the north side of town);
 - Rail road prevents delivery of goods (food and wood), animal-drawn transport from neighboring towns;
 - Rail road disrupts the work of timber exchange.
- The document was signed 364 inhabitants.

What is the significance of the invention and construction of railways in the 19th century? Compare the reactions of American citizens and Russian peasants in the construction of the railway. What was the reason for the negative attitude to the innovation? Do all inventions meet with resistance? Can you give other examples? What can be done to reduce the resistance of innovation?

Self-assessment

Question 1.1

J. Schumpeter was the first scientists who used the term:

- a) competition;
- b) discovery;
- c) invention;
- d) innovation.

Question 1.2

Diffusion of innovation is:

- a) Sale of intellectual property;
- b) sharing of best practices;
- c) spread and reproduction of innovation;
- d) receptivity to innovation.

Question 1.3

Innovative activity and scientific activity – it is the same things?

- a) Yes;
- b) No.

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Unit 2. Scientific and technological forecasting

The learning outcomes

On completing Unit 2, students should be able to:

- explain the importance of scientific and technological forecasting for business;
- give examples of trends in some sectors;
- list the methods of scientific and technological forecasting.

Activity 2.1

10-15 years ago, many products have not been on the market, because they have not yet been invented, for example, Wi-Fi routers. Name similar examples and write them into the left column of Table. Do you name products, which existed on the market 10-15 years ago, but absent now? For example: pagers. Write your results into the right column of Table 2.1. Make a conclusion about the impact of innovations on the market of goods and services.

Table 2.1 - Obsolete and modern products

Modern products	Obsolete products

Activity 2.2

The two main sources of ideas for new products is a scientific and technical achievements, as well as the desires and demands of consumers. Think about what products you would like to see on the market in the next 15-20 years. May be a flying cars or robot-driver? Compare your desires and ability of science and technology, which were described in the forecast by National Institute of Science and Technology Policy (NISTEP), Japan. This information can be obtained from the teacher or on the NISTEP website (report #145).

Activity 2.3

A space elevator is a proposed type of space transportation system working without the use of large rockets. Its main component is a ribbon-like cable anchored to the surface and extending into space.

In February 2012, a Japanese construction firm Obayashi Corporation announced that in 38 years it could build a space elevator using carbon nanotube technology. 30 passengers will be able to reach the satellite which is 35,786 kilometers up high after a 7.5 days trip. No cost estimates, finance plans, or other specifics were made.

Try to name variants of the commercial application of this object. Do you think the company Obayashi Corporation will be able to make a profit in the implementation of this project?

Activity 2.4

Here are averaged data on the speed of aircraft in the period from 1903 to 1976 (see Table 2.2.). Plot the dependence of the speed and time (use Figure 2.1.). What can you say about the resulting curve? What is its name, why? What is a classical form of those curves? Why is the curve not quite the classical form? (*Recall, after the Second World War were made jets.*)

Table 2.1 – Speed of aircraft, km/h

Year	Speed	Year	Speed	Year	Speed
1903	11	1923	400	1952	1124
1906	41	1924	448	1953	1187
1907	53	1927	479	1955	1323
1909	69	1928	513	1956	1822
1910	98	1929	559	1957	1944
1911	124	1931	656	1958	2260
1912	164	1933	682	1959	2422
1913	192	1934	709	1961	2585
1914	217	1945	976	1962	2681
1920	296	1946	991	1965	3332
1921	330	1947	1027	1976	3530
1922	359	1948	1080		



Figure 2.1 - The speed of aircraft

Self-assessment

Question 2.1

What is the essence of the Kondratiev's theory?

- a) study of changes in the organization of production;
- b) study the problems of innovation statistics;

c) develop a model of cyclical fluctuations.

Question 2.2

Duration of Kondratiev waves (long waves) is:

- a) 7-10 years ;
- b) 20-40 years;
- c) 40-60 years;
- d) 60-80 years;
- e) About 100 years.

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Unit 3. Innovative potential and innovative climate

The learning outcomes

On completing Unit 3, students should be able to:

- list of indicators used to access the innovative climate and innovative potential;
- characterize the country (region, company) innovative potential;
- characterize the innovative potential of the enterprise.

Activity 3.1

Compare the structure of the two main indices, reflecting the innovative potential in the country (Table 3.1). Find general and specific factors included in each of these indices.

Table 3.1 - The structure of the innovative indices

ICI (Innovation capacity index)	GII (Global Innovation Index INSEAD)
1.Research and developments: <ul style="list-style-type: none"> - R&D infrastructure; - Patents and trademarks; 2.Institutional environment: <ul style="list-style-type: none"> - Country policy assessments; - Good governance; 3.Regulatory and legal framework. 4.Human capital, training and social inclusion: <ul style="list-style-type: none"> - Education; - Social inclusion and equity policies; 5.Usage of ICT: <ul style="list-style-type: none"> - Quality of the infrastructure; - Government ICT usage; - Telephone, mobile cellular communications, Internet, computer, TV. 	1.Innovation Output <ul style="list-style-type: none"> - Science outputs (Knowledge creation, knowledge application, exports & employment); - Creative outputs (Creative Outputs, benefits of social welfare); 2.Innovation Input <ul style="list-style-type: none"> - Institutions (Political environment, regulatory environment, condition for business, provided by public institutions); - Human Capacity (Investment in education, quality of educational institution, innovation potential); - Market sophistication (Investors & Credit conditions, assess to private credit); - Business sophistication (Innovation environment in firms, Innovation Ecosystems, opening to foreign & domestic competition); - ICT & uptake of infrastructure (ICT infrastructure, general infrastructure, uptake & use of infrastructure)

Activity 3.2

Analyze the rankings of countries (Top 15) determined with the help of indices ICI and GII INSEAD (Table 3.2). What trends are you could find?

Table 3.2 - Innovative Ranking

Rank	ICI 2003	ICI 2010-11	GII INSEAD 2003	GII INSEAD 2011
1	USA	Sweden	USA	Switzerland
2	Finland	Switzerland	Sweden	Sweden
3	UK	Singapore	Finland	Singapore
4	Japan	Finland	Japan	Hong Kong
5	Germany	USA	Switzerland	Finland
6	Singapore	Denmark	Iceland	Denmark
7	Sweden	Canada	Denmark	USA
8	Denmark	Netherlands	Germany	Canada
9	Switzerland	Taiwan	Canada	Netherlands
10	France	Luxemburg	UK	UK
11	Netherland	South Korea	France	Iceland
12	Canada	Norway	Norway	Germany
13	Taiwan	Hong Kong	Belgium	Ireland
14	Israel	New Zealand	Netherlands	Israel
15	Australia	UK	Ireland	New Zealand
16...				South Korea
18...			South Korea	
20...	South Korea			

Select two - three of the countries. Examine the change in their ranks over the period 2003-2011. Analyze and compare the factors by which this change occurred. When performing the task, use Table and The Innovation for Development Report (see Table 3.3).

Table 3.3 - Innovation Capacity Index and their Pillars.

Pillars	Countries		
	1	2	3
1. Research and developments: - R&D infrastructure; - Patents and trademarks;			
2. Institutional environment: - Country policy assessments; - Good governance;			
3. Regulatory and legal framework.			
4. Human capital, training and social inclusion: - Education; - Social inclusion and equity policies;			
5. Usage of ICT: - Quality of the infrastructure; - Government ICT usage; - Telephone, mobile cellular communications, Internet, computer, TV.			

Activity 3.3

In Russia measurements of region innovation potential are performed by The National Center for Development of Innovative Technologies (NC DIT). NC DIT uses instruments similar to those that apply European Commission since 2000 (European Innovation Scoreboard). NC DIT index includes three pillars: innovation environment, regulatory environment, production and usage of innovation.

Analyze the ranking of Russian regions (Table 3.3) and mark on a Russia map (Figure 3.1) regions are included in the Top 10 of this ranking (red color for 2011; vertical shading for 2010; horizontal shading for 2009).

Table 3.3 - NC DIT index

Rank	2009	2010	2011
1	Moscow - fed. city*	Moscow – fed. city	Moscow – fed. city
2	St.Petersburg – fed. city	Moscow obl.	Tatarstan rep.
3	Tver obl.*	Nizhny Novgorod obl.	St. Petersburg – fed. city
4	Nizhny Novgorod obl.	Tatarstan rep.	Nizhny Novgorod obl.
5	Penza obl.	St. Petersburg – fed. city	Tomsk obl.
6	Moscow obl.	Tomsk obl.	Samara obl.
7	Khabarovsk kr.*	Tver obl.	Novosibirsk obl.
8	Samara obl.	Altai kr.	Bashkortostan rep.
9	Altai kr.	Bashkortostan rep.	Altai kr.
10	Tatarstan rep.*	Novosibirsk obl.	Penza obl.

- Federal subjects: fed. city – federal city, obl. – oblast (province), kr. – krai (territory), rep. – republic.



Figure 3.1 - Administrative map of Russia

Activity 3.4

Here are some questions that are used to characterize the company innovation potential /4/. For each question have four answer choices. Carefully review the answers and make a guess: what should be the companies who have chosen each of the above options.

Variant 1

Marketing

Market information flow inside the company:

- a) Existing knowledge gained from the practice is sufficient and known to all responsible employees and for that reason it is not necessary to pay systematic attention to further collection and processing of information;
- b) Responsible employees usually follow the information about market, consumers and competition; they are not systematically shared within the company;
- c) Information about the market is registered in the company's information system, the employees do not fully use it;
- d) The company has a sophisticated information system that is used by responsible employees.

Variant 2

Technological process

Changes of used technologies:

- a) The company cannot afford to change its technologies at the time being;
- b) Changes are introduced under the pressure from outside, mostly randomly;
- c) Changes are introduced in accordance with the plan, after their introduction their contribution is not any more specifically monitored or evaluated;
- d) Technology changes are planned and their effectiveness is always evaluated.

Variant 3

Organization and human resources

Company information system:

- a) It is difficult to get information necessary for the operative management;
- b) Information system collect the information, but at present does not allow its effective use for the improvement of the company performance ;
- c) The company information system is suitable for the operative management, but it does not contain processed information for the strategic management;
- d) The company information system contains easily accessible information for both operative and strategic management.

Self-assessment

Question 3.1

The company innovation potential is:

- a) Company's ability to develop and implement innovations in various areas of its activities;
- b) Level of production organization and management organization.

Question 3.2

The company innovation potential includes:

- a) intellectual resources;
- b) material resources;
- c) financial resources;
- d) human resources;
- e) infrastructure resources;
- f) all of the above.

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Unit 4. Innovative business strategy

The learning outcomes

On completing Unit 4, students should be able to:

- classify innovative strategies;
- understand risks of different innovative strategies;
- analyze the firm's innovative strategy.

Activity 4.1

According to the theories Ramensky L.G. and Frizevinkel H. can distinguish four types of competitive behavior. Each type of behavior associated with any animal. In the Table 4.1 you see the classification of the types of competitive behavior and the parameters that can be used to characterize each type of competitive behavior. Explain the choice of animal for each type of competitive behavior.

Table 4.1– Four types of competitive behavior

Parameter	“Violent”*			“Patient”	“Explerent”	“Commutant”
	Proud lion	Mighty elephant	Hulking hippo	Sly fox	Swallow	Gray mouse
1.Size of enterprise						
2.Stability of the company						
3.Expenditure on R&D						
4.Competitive advantage						
5.Quality of products						
6.Range						
7.Distribution network						
8.Advertising						
9.Scale of production						
10.Presence of branches						

* If you think that the selected parameter is characterized by the same way for lions, elephants and hippos, write only one answer for the three subgroups.

Activity 4.2

Determine the type of competitive behavior, used by the company at various stages of existence.

Example 1

The Company was founded in 1996 by four young programmers. It offered the market a program to exchange instant messages over the Internet. The program was developed by the founders of the Company directly. Against the background of attempts to other companies trying to develop such software products in the same period, this firm offered the high quality and free distribution of its products. The number of users grew with enormous speed. In 1998 the right to purchase the business became the subject of a dispute between such giants as Microsoft and AOL. As a result of negotiations the Company was sold for \$287 million.

Example 2

The company was established in 1911 when merging several small firms. One of these firms was founded by the inventor of the electric machine for processing statistical data and engaged in the production of this equipment. The new company produced a wide range of electrical equipment and had significant sales in different parts of the world. Even in the most difficult times the company has continued to fund their own research. The result was a number of revolutionary developments in hardware and software that sets the standard for the industry. The company now occupies a leading position in the market for many items of a very wide range.

Example 3

The company was founded in 1990 by a group of chemists. Initially, they used their design to search for toxic substances in the environment. The solution to this problem has led to the need for production of high quality laboratory equipment, which became the basis of the range of the company. Gradually, the company moved to the complex equipping of laboratories, including laboratory furniture. Now the company successfully operating on the Russian market, it has regional offices in Russia and CIS countries. Currently, the Russian market includes more than 250 manufacturers of laboratory equipment.

Activity 3.3

This fragment was published on the website of P&G.

“P&G's Purpose is to improve more lives in more parts of the world more completely, with an unrelenting focus on innovation. We want to partner with the best innovators everywhere, and we employ a number of approaches to connect with a network of top innovators around the world. We call our approach to open innovation Connect + Develop.

We're very proud that more than half of new product initiatives at Procter and Gamble involve significant collaboration with those outside our walls. We partner with small companies, multi-nationals, individual inventors, and in some cases, even our competitors, to bring game-changing innovations to market. Connect + DevelopSM is at the heart of how P&G innovates.

This site has been created to help external innovators and companies learn how Connect + Develop works. Here you can read about our past successes, our current needs, and what we look for in an innovation partnership. And if you are the owner or representative of an innovation that might help improve the lives of our consumers,

this site can help you to reach out by submitting your innovation for review by our Connect + Develop Team.”

What do you think, why the company proposed a similar initiative? What terms can be used to describe such a strategy? Apply any other similar types of strategies? Read the summary of the book by Henry Chesbrough /2/. The company's strategy corresponds to the ideas expressed by them in this book?

Activity 4.4

Select a pioneer firm:

a)diapers:

1. Proctor & Gamble;
2. Kimberly-Clark Corporation (Huggies);
3. Svenska Cellulosa Aktiebolaget – SCA (Libero);
4. Chux.

b)personal computers:

- 1.Apple Inc.;
- 2.IBM;
- 3.Dell Inc;
- 4.Micro Instrumentation and Telemetry Systems.

c)laser printers:

- 1.Hewlett Packard;
- 2.Samsung Electronics;
- 3.Lexmark International Inc.;
- 4.Xerox Corporation.

If your answer is 4-4-4, you are right. This test is based on research /1/ by G. Tellis and P. Golder (“Will and Vision. How Latecomers Grow to Dominate Markets?”) They analyze 50 kinds of goods (beer, safety razors and other) and conclude about role of pioneering firms and pioneer advantages. What are their conclusions? Do you agree with them?

Self-assessment

Question 4.1

For each strategy, select the appropriate features (by Mark Dodgson, David M. Gann, Ammon Salter).

Strategies:

- a) proactive;
- b) active;
- c) reactive;
- d) passive.

Features:

- 1)defending existing technologies and markets:
- quickly reaction to the changes of markets and technologies;

- incremental innovation with in-house applied R&D.
- 2) waiting until customers demand a change in products or services.
- 3) copying proven innovation.
- 4) strong research orientation:
 - first mover advantage;
 - technology market leadership.

Question 4.2

What is the size of the violent – firm:

- a) large;
- b) medium;
- c) small.

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Unit 5. Innovative infrastructure

The learning outcomes

On completing Unit 5, students should be able to:

- give definitions of basic elements of the country's (region's) innovative infrastructure;
- give some examples for important elements of innovative infrastructure;
- summarize trends of innovative infrastructure development in firms.

Activity 5.1

Determine which type of object of innovation infrastructure is shown in Figure 5.1. What are the synonyms of the names of such objects? What other services (other than those listed) may be offered to residents in the area? Discuss the features of the existence of similar facilities in Russia.

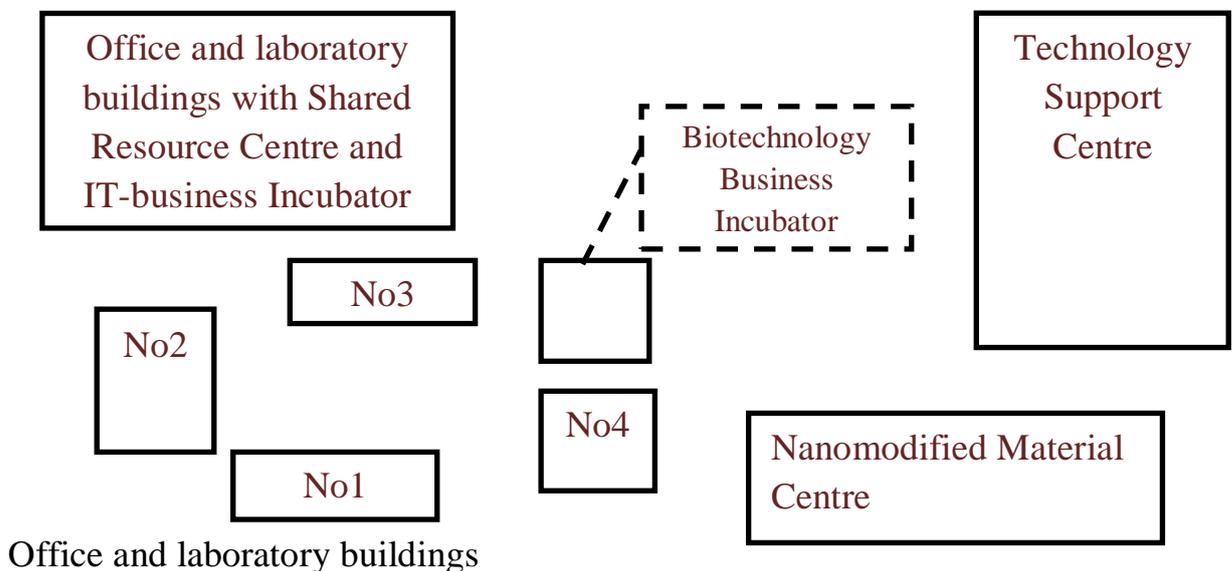


Figure 5.1 - An object of innovation infrastructure (Russia).

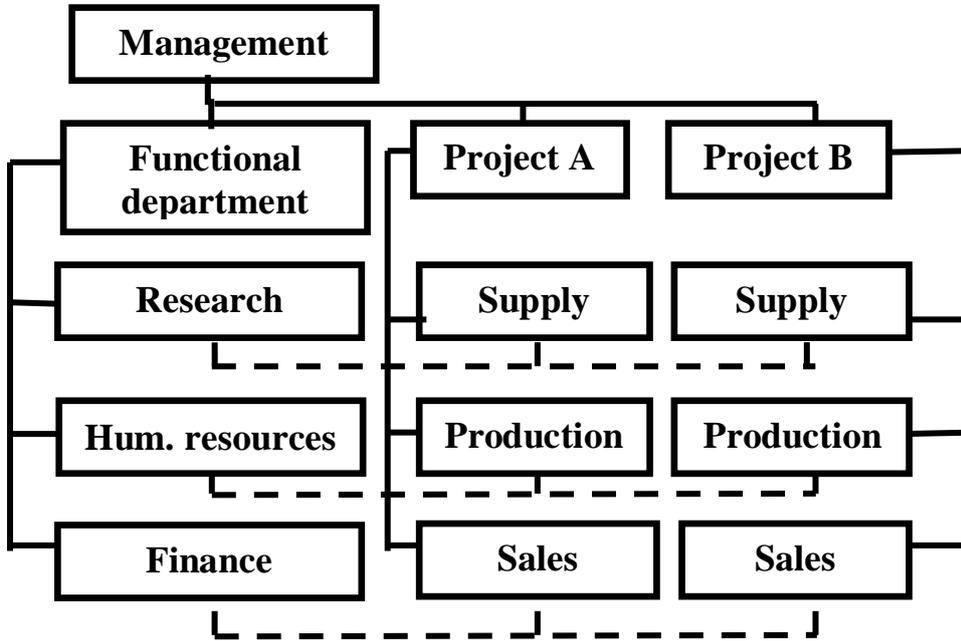
Here, innovative companies are also invited to:

- lease / purchase of premises;
- design and technology services;
- facilities for manufacturing of mechanical components;
- support for radio and electrical installation technologies;
- testing laboratories;
- printing, copy center, and packing services;
- lecture rooms, conference halls.

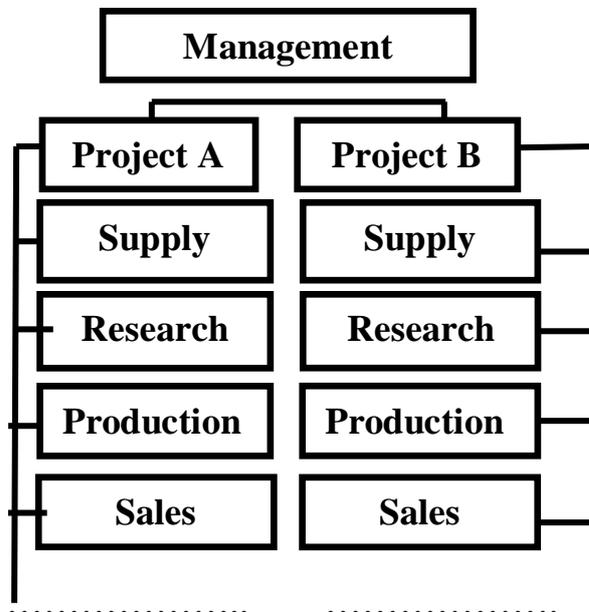
Nearby are a large number of university and research institutes.

Activity 5.2

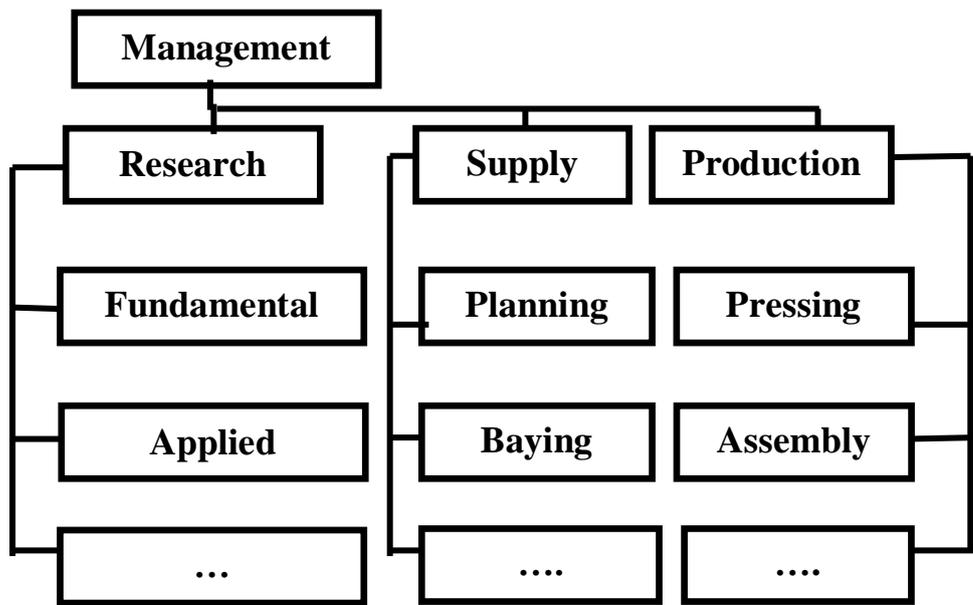
The Figure 5.2 shows four types of organizational structures of an innovative enterprise: functional, divisional, matrix, project. Determine what type of structure is shown in each figure.



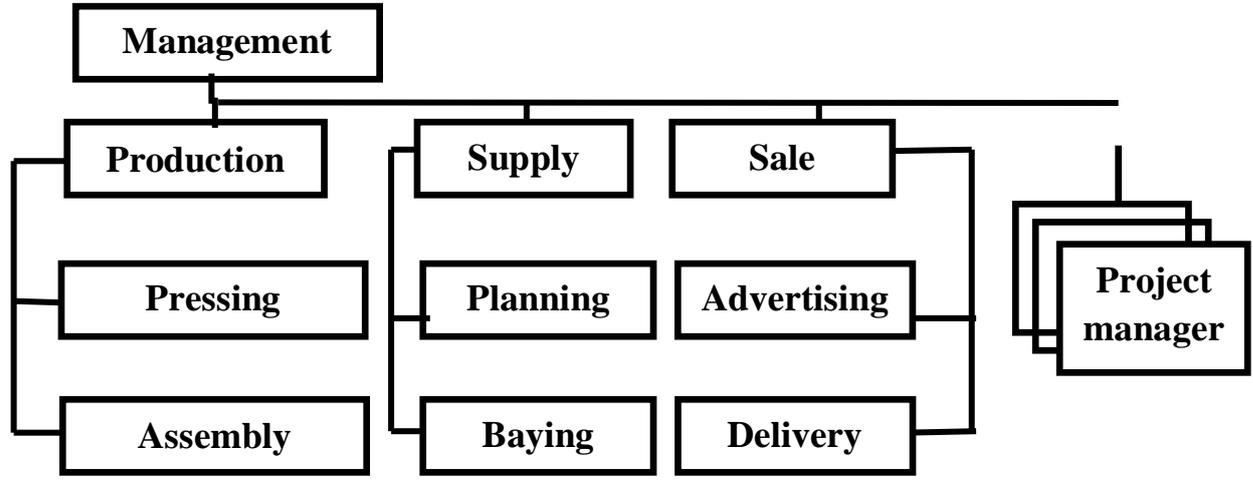
a)



b)



c)



d)

Figure 5.2 - Types of organizational structures of an innovative enterprise.

Try to choose from the list (Table 5.2) strengths and weaknesses of each structure.

Table 5.2 - Strengths and weaknesses of organizational structures

Description	Strength (+) or weakness (-)	Type of structure
acceptance of compromise decisions		
decrease in personal responsibility for the outcome		
difficulty of implementing a uniform policy		
difficulty of monitoring the progress of the process		
double subordination		
duplication of functions		
ease of formation of overall innovation policy		
flexibility of the system		
specialization managers		

Activity 5.3

Text 1

In early 1980, 3M has set a goal: sales of products developed over the past 5 years should be at least 25% of the income of each division. It allows employees to devote 15% of their working time to implementation of individual projects. This often gives good results. Engineer Arthur Fry worked at 3M, and sang in the church choir. He was looking for a way to simplify the use of prayer-book during the singing. This problem was not related to his main job. However, he recalled that his colleague has developed special glue. Sheet of paper covered with such glue peel easily. In addition, the glue does not leave traces. Up to this point, the invention of the glue was considered a failure for the company. Solving your own task, Fry invented a product called Post-it note. Sales volumes of Post-it are unknown, but there is evidence that it is about 15% of the total revenue of the company, i.e. billions of dollars. Arthur Fry is now working in the company 3M. He is the most honorary employee.

Could Arthur Fry start his own business? What are the advantages of this way? What are the disadvantages of this way? Which way would you prefer?

Text 2

The company IBM has developed the concept of an independent division. Each division was seen as a separate organization. Each division had its own mini-board of directors and was able to make decisions about production and sales. The company had more than 10 such divisions. One of them (IBM Entry Systems Division, 1983) was headed by Philip Don Estridge. His goal was developing a low-cost personal computer to compete against increasingly popular offerings from the likes of Apple Computer, Commodore International. The result was the creation of IBM PC.

What are the similarities in the situations described in the texts? What term can be defined this way of innovation?

Self-assessment

Question 5.1

The main purpose of business incubators is:

- a) training employees;
- b) advising companies on accounting;
- c) products promotion of new businesses;
- d) support the successful development of entrepreneurial companies.

Question 5.2

What is a business model or function that relies on a large group of users as third parties for outsourcing certain tasks?

- a) Spin-off;
- b) Crowdsourcing;
- c) Reengineering;
- d) Industrial park.

Question 5.3

Who first used the terms ‘intrapreneur’, and ‘intrapreneurship’?

- a) Maslow;
- b) Schumpeter;
- c) Drucker;
- d) Pinchot.

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Unit 6. Funding for innovation

The learning outcomes

On completing this Unit 6, students should be able to:

- describe financing needs of innovative enterprises;
- list sources of finance for innovative firms;
- give basic characteristics of these sources.

Activity 6.1

Each innovative enterprise passes through several financing stages: the seed stage, the start-up stage, the early-growth stage and the expansion stage. You can see a number of statements that characterize the innovative enterprise at different stages. For each of these statements indicate the most appropriate stage.

1. Production is expanded.
2. Profit is unstable.
3. Production is small-scale.
4. Laboratory tests are conducted.
5. Company is in the process of creating.
6. Company has a prototype.
7. Company has recently established.
8. Company has a business-idea.
9. Company owns a certain share of the market.

Now read brief overview on the development of several Russian innovation companies. What kinds of stage can you find in their development?

Yandex

Yandex is a Russian internet company which operates the largest search engine in Russia. Yandex ranked as the 5th largest search engine worldwide. A company "Comptek" was founded by A. Volozh in 1988. In 1993-97, years "Comptek" worked to develop search software. The search engine yandex.ru was launched in 1997. A company "Yandex" was founded in 2000 as an independent organization. In 2002, Yandex reached self-sufficiency. In 2010, the share of Yandex for search queries in Runet the first time in four years has exceeded 60%. Yandex is constantly increased the number of services offered. In 2011, Yandex raised \$1.3 billion in an initial public offering on the NASDAQ. It was the biggest U.S. IPO for a dotcom since Google Inc. went public in 2004.

First Quarter 2012 Financial Results:

- revenues of RUR 5.9 billion (\$200.3 million), up 51% compared with Q1 2011;
- net income of RUR 1.3 billion (\$42.9 million), up 53% compared with Q1 2011;
- share of Russian search market averaged 59.4% in Q1 2012 (according to LiveInternet).

Activity 6.2

Various stages of development of innovative companies require the use of different types of investors. What kinds of the sources of funds were attracted by Google Inc.? What are the characteristics of each type of investors (the time of investment, investment amount, size and form of the expected results, and so on). Is the Google's history typical for successful innovative firm?

The company was incorporated in 1998. But the domain name was registered earlier, in 1997. And their research project the company's founders began in 1996. Their work within the Stanford Digital Library Project was funded through the National Science Foundation. For incorporated of company was used a \$100,000 contribution from Andy Bechtolsheim, co-founder of Sun Microsystems. Then were received funding from several investors who have decided to follow the example of Bechtolsheim (commonly referred to five of these investors).

In 1999 the founders and owners of companies have tried to sell it for around \$1 million, but to no avail. But in this year Google received \$25 million from firms Kleiner Perkins Caufield & Byers (KPSB) and Sequoia Capital.

KPSB has traditionally focused on early-stage investments, but also does later-stage investments. Since 1972, KPSB has backed entrepreneurs in more than 500 firms including AOL, Amazon.com, Citrix, Compaq, Electronic Arts, Genentech, Genomic Health, Intuit, Juniper Networks, Netscape, Sun, Symantec. More than 150 of the firms, financed by KPSB, have gone public. Sequoia Capital was founded in 1972 and has funded companies including Apple, Aruba Networks, YouTube, PayPal, Cisco Systems, Oracle, Yahoo!, Green Dot. It invests between \$100,000 and \$1 million in seed stage, between \$1 million and \$10 million in early stage, and between \$10 million and \$100 million in growth stage.

Google's (IPO) took place in 2004. The Google's market capitalization was more than \$23 million.

Activity 6.3

Read the materials prepared based on the Russian edition of Forbes magazine.

Gleb and Igor (two Russian students) live in America. they invented an inexpensive, high-quality coffee machine. It is almost two times cheaper than existing counterparts. The inventors did not use traditional ways of finding investment. They were against the transfer to investor a part of their business. Gleb and Igor posted a message on the site Kikstarter. They pointed out that the retail price of coffee machines is \$ 400 and offered to order it at a price \$ 200. The report aroused the interest of users. They actively make orders. As a result, the cost of coffee machines has been increased to \$ 300 first, and then to \$ 350. Even the inventors did not expect so many orders. Within 45 days they received \$ 370 000 from 1500 users worldwide. Investments have been found. The inventors of the concept of business partially revised in the light of increased demand for their invention.

Which method was used by the inventors to search for investment? What are the advantages of this approach? Do you know of any projects that were financed in the same way? What other sites publish similar reports about inventions? Did you participate in similar projects?

Self-assessment

Question 6.1

Find features of the venture capital firm in a list. You can mark more than one answer.

- a) venture capitalist invests for a period of 10 years or more;
- b) venture capitalist assumes all risks, including technical risk;
- c) venture capitalist assumes only commercial risk;
- d) venture capitalist invest for a period of not more than 5-7 years;
- e) venture capitalist seeks to controlling interest;
- f) venture capitalist doesn't seeks to controlling interest;
- g) venture capitalist requires collateral.

Question 6.2

What is the risk of a venture capitalist?

- a) Financial;
- b) Managerial;
- c) Technical;
- d) Market.

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Unit 7. Intellectual property management

The learning outcomes

On completing this Unit 7, students should be able to:

- distinguish between the basic terms: patent, license, intellectual property, industrial property, copyright etc.;
- have an understanding of license agreements;
- know the international organizations dealing with intellectual property.

Activity 7.1

Russia is a member of World Intellectual Property Organization (WIPO). In accordance with international and Russian law, the results of intellectual activities can be divided into several groups (see Table 7.1)

Table 7.1 – Results of intellectual activities

Industrial property	Copyright (author's rights)	Related rights	Results are not Intellectual property
1.	1.	1.	1.
2.	2.	2.	2.
...

Distribute the following examples among these four groups: architectural designs, discoveries, drawings, films, geographic indications; industrial designs, inventions, mathematical methods; musical works, novels, paintings, performing artists in their performances, photographs, poems, producers of phonograms in artists recordings, scientific theories, sculptures, secret inventions trademarks, define inventions as new solutions to technical problems.

Activity 7.2

Consumers have the opportunity to buy "old" product. Price of the "old" product is P_1 . Consumers are willing to buy this product in an amount Q_1 . Innovator offers a "new" product, produced by new technology. The cost of producing a "new" product is lower. It can be sold at a price P_2 (lower than P_1). In this case consumers are willing to buy a "new" product in an amount Q_2 (greater than Q_1). But invention is patented. Other companies can produce only an "old" product.

Draw the demand and supply curves, if:

- "old" product is only sold;
- "new" product is sold. Innovator (inventor) has a patent;
- "new" product is sold. Innovator (inventor) hasn't a patent;

In each of these cases compare the results obtained by the innovator (inventor) and by the society.

Activity 7.3

Royalties are usage-based payments made by one party (the "licensee") to another (the "licensor") for the right to ongoing use an intellectual property. Below (see Table) are factors that affect the royalty rate. Indicate how each of these factors affects the size of the royalty rate. May be do you know other factors?

Table 7.2– Factors affecting the patent royalty rate.

Factor	Affect
Legal protection (patent license/non-patent license or know-how)	Royalty rate of patent license higher than it of non-patent license
Transferable rights (non-exclusive license/exclusive license)	
Term of license agreement (short-term/long-term)	
Area of license agreement (small/large)	
Dependence of the licensee to the licensor in the raw materials, equipment etc. (strong/weak)	
Investments for the creation of production (high/low)	
Transmitted documents (complete/incomplete)	
Volume of licensed products from the licensee (large/low)	
Industry or type of product	
...	

Self-assessment

Question 7.1

International organization encourages creative activity, to promote the protection of intellectual property throughout the world. Its name is:

- a) UNIDO - United Nations Industrial Development Organization;
- b) UNESCO - United Nations Educational, Scientific and Cultural Organization;
- c) WIPO - World Intellectual Property Organization;
- d) EPOrg - European Patent Organization;
- e) EAPO - Eurasian Patent Organization.

Question 7.2

The maximum term of a patent for an invention is:

- a) 5 years;
- b) 10 years;
- c) 15 years;

- d) 20 years;
- e) indefinitely.

Question 7.3

License price increases due to:

- a) the difficulties in preparation of contract;
- b) the difficulties of translation of large volumes of technical documentation;
- c) the inability to demonstrate the object of the license in an industrial environment;
- d) the permission to use the licensor's distribution network.

Question 7.4

The licensor is:

- a) a person who holds a patent;
- b) a person purchasing the license;
- c) a person selling the license.

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Unit 8. Government regulation of innovation

The learning outcomes

On completing Unit 8, students should be able to:

- list methods of government regulation of innovation;
- understand what state agencies regulate and support innovation;
- describe the features of state policy to support innovation in different countries.

Activity 8.1

Below are the functions of state bodies that regulate activities in the field of science and innovation. Read and find out which state body is implementing each of these functions. A list of state bodies is also given in the text of this activity.

List of function

Addressing issues related to developing state policy with regard to the modernization and technological development of Russia's economy, coordination work of federal executive authorities, regional executive authorities, bodies of local self-government, business and expert communities with regard to the modernization and technological development of Russia's economy, and identification priorities, forms and methods of state regulation aimed at modernizing and technologically developing Russia's economy.

Creation conditions for energizing of innovative activity.

Development the Russian nanotechnology industry through co-investment in nanotechnology projects with substantial economic potential or social benefit.

Encourage innovation in existing enterprises, promotion innovative new companies, increase demand for innovative products and support the innovative orientation of the sector of science and education.

Implementation of state control (supervision) over observation of the requirements of technical regulations and obligatory requirements of standards.

Registration of intellectual property rights and also license agreements and assignment agreements in the sphere of intellectual property and publication of data on the registered intellectual property rights.

List of state bodies.

The Federal Agency on Technical Regulation and Metrology.

The Federal Service for Intellectual Property (Rospatent).

The Ministry of Economic Development of the Russian Federation.

The Ministry of Education and Science of the Russian Federation.

The open joint-stock company Rusnano.

The Presidential Council for Economic Modernization and Innovative Development.

Activity 8.2

The company is implementing an investment project. To do this it buys a new and modern equipment to replace the old. The cost of the modern equipment is 800000 rub. The company's pretax profit will be 1000000 rub in the first year; 1500000 rub in the second year and 3000000 rub in the third year and 4000000 rub in the fourth year. Profit tax rate in Russia is 20%. Calculate the amount of profit tax (Table 8.1)

Table 8.1- Profit tax, rub

	1 year	2 year	3 year	4 year
1.Pretax profit				
2.Profit tax (20%)				
3.Net profit				
4.Amount of tax credit				
5.Profit tax (with tax credit)				
6.Net profit (with tax credit)				

The company decided to exercise the right to an investment tax credit (articles 66-67 of The Tax Code). The amount of credit is 100% of the cost of the equipment. Loan term is 3 years. The company has the right to reduce by 50% the amount of profit tax, which transferred to a budget of a subject of the Russian Federation. Companies transfer profit tax calculated at a rate of 18% in a budget of a subject of the RF. Calculate the amount of profit tax with using an investment tax credit.

The rate of investment tax credit ranges from 50% to 75% of the Central Bank of Russia refinancing rate. As of July 2012 the central bank's refinancing rate is 8%. Compare rates on the investment tax credit to rates on other types of loans.

Answer the questions.

- What is the investment tax credit?
- Why an investment tax credit is beneficial for the enterprise?
- Why an investment tax credit is beneficial for the state?

Self-assessment

Question 8.1

The phrase 'NASA spin-off technologies have been produced for over forty years' means that:

- NASA technologies has been commercialized;
- NASA technologies hasn't been commercialized;
- any NASA technologies were secret and they remain secret now.

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N.G. Kopasovskaya

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