



THE EFFECTIVENESS OF INNOVATIONS IN THE MANAGEMENT OF INFORMATION AND COMMUNICATION TECHNOLOGIES IN THE REPUBLIC OF UZBEKISTAN

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ABSTRACT: *This article describes a number of research on the development of information and communication technology enterprises, the management of innovative processes in the field of ICT in the context of globalization and the factors influencing this area. Formation of an integrated indicator of effective management of innovative processes in the field of ICT. Methods for evaluating the effectiveness of management of innovative processes in the field of information and communication technologies. The number of Internet users in Uzbekistan has exceeded 23 million, despite the slowdown in recent years. It also highlights the advantages of the regression model, in which the net profit of Uzbektelecom JSC depends on the amount of investment in innovation.*

KEYWORDS :information and communication, innovation, internet, investment, e-government, computer literacy, human intellectual and creative activity, discoveries, inventions and innovators, global network, telecommunications, computer technology.

INTRODUCTION.

An important aspect of economic reforms in the world is the development of the digital economy based on information and communication technologies, which are one of the most important elements of a market economy in the era of globalization. In the world, almost 60% of the total cost of innovation is in the field of information and communication technologies.¹

A number of research projects on the development of information and communication technology enterprises in the context of globalization, including the role of infrastructure in the provision of products and services, the impact of ICT on the world

¹<https://www.itu.int>



market and the digital economy, e-government, online services Extensive research is being conducted to study the management of innovative processes in the field of ICT. In this regard , special attention should be paid to the application of experience gained in international practice and the management of the infrastructure of enterprises in the field of ICT in the country.Improving the scientific basis for improving efficiency, developing a methodology for evaluating the effectiveness of management of innovative processes is one of the most pressing issues today .

ANALYSIS OF THE LITERATURE ON THE SUBJECT:

Ilenkovoy S.D. According to him, innovation processes are considered as a process of preparation and implementation of innovative changes, consisting of interrelated stages as a result of the emergence of current innovations.

Zavlina P.N. An innovation process is a process of transforming scientific knowledge into innovations, in which innovations can be expressed as a chain of events that transitions from an idea to a specific product, technology or service and is disseminated in practical use.

Stig Ottosson The process from idea to commercial product is called innovation process.

Approaching the above considerations, we have interpreted the economic classification of the term innovation process as follows: Innovation process is the process of translating scientific knowledge into practical application of an innovative idea with human intellectual and creative activity, discoveries, inventions and rationalization proposals.²

RESEARCH METHODOLOGY:

With the development of the Internet during the pandemic, the development of the ICT sector is accelerating. The widespread use of ICT in various sectors of the economy has become one of the key factors in improving the socio-economic status of society, stabilizing economic growth. The rapid growth of the global Internet has led to an increase in computer literacy among the general population, the widespread popularity of telecommunications, computer technology and other new means of communication, as well as effective means of exchanging information through the global network. The rapid growth

²Author's development.



of the process of implementation of innovative products and services has confirmed the expediency of considering the effective management of this sector. Modernization of the ICT sector and the development of innovative processes will allow the construction of e-government, the development of the digital economy, increase the efficiency of government and increase the competitiveness of the country's economy.

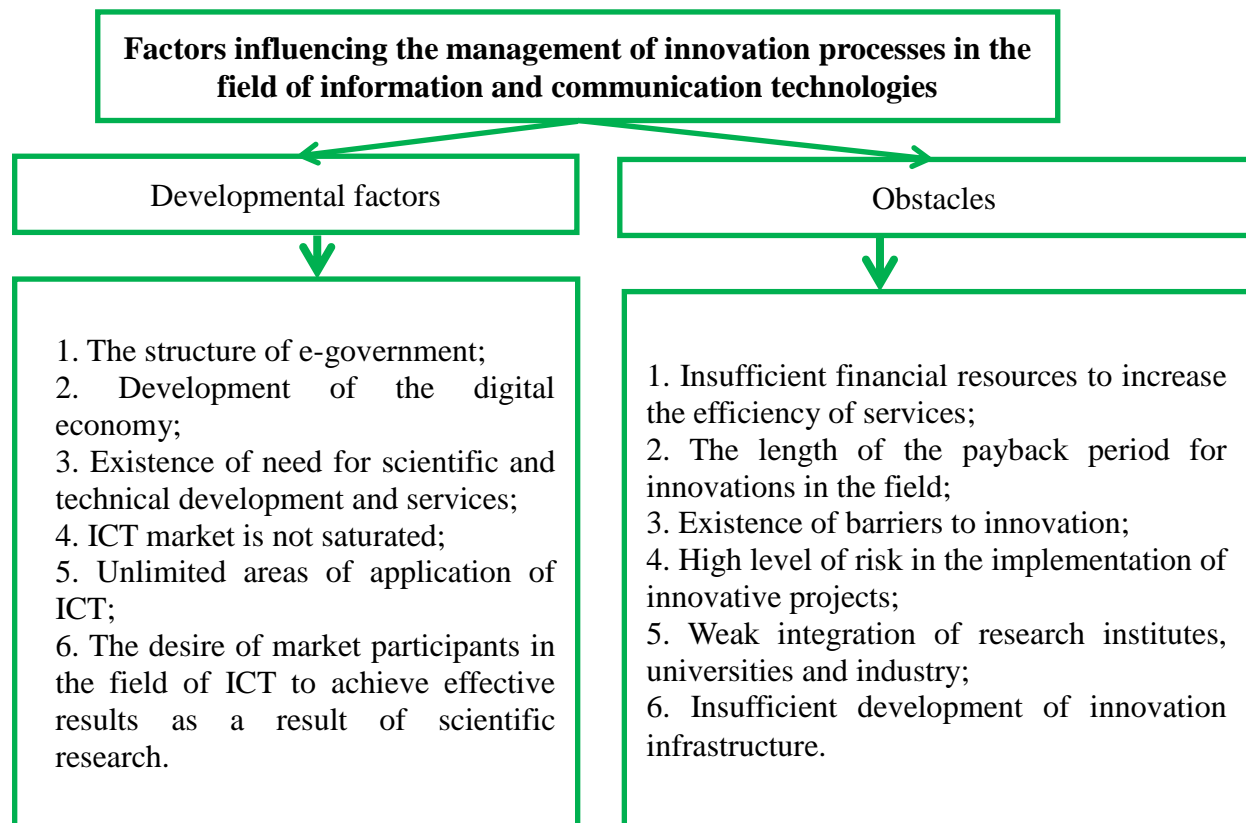


Fig. 1 Factors influencing the management of innovation processes in the field of information and communication technologies³

these factors will help to identify areas that affect the development of innovative activities in the field of ICT, as well as management approaches.

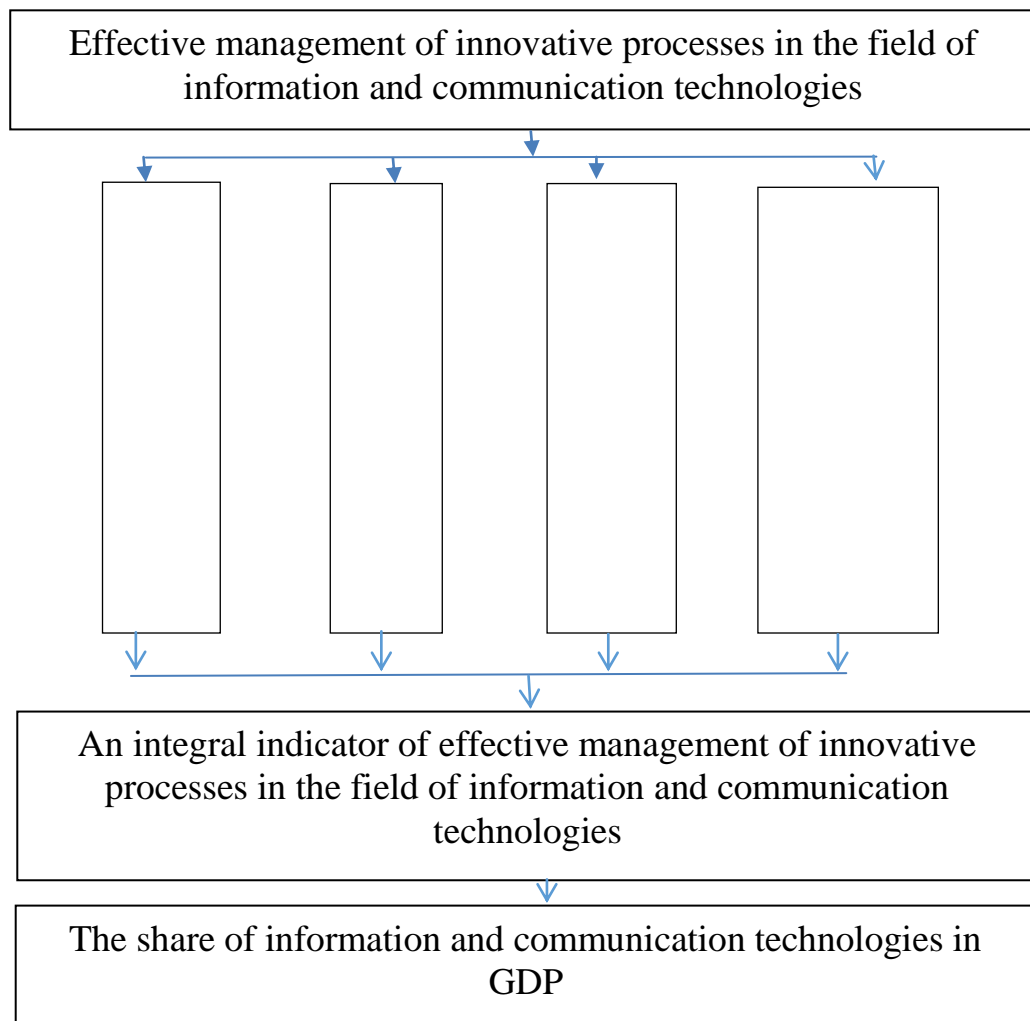
Today, the structure of innovative processes in the field of ICT includes: the emergence of mobile communications and the Internet; mobile internet development; development of mobile applications; creation of cloud technologies; e-commerce and e-

³Developed by the authors



business development; 3G and 4G mobile internet development; Introduction of Wi-Fi technologies; mass introduction of intelligent platform services; IoT - (Internet of Things) Internet of Things; BigData popularity; proliferation of chat bots and corporate information systems; 5G will be introduced; development of the digital economy.

In recent years, the world experience has a number of ways to assess the innovative development of countries, in which the development of the ICT sector plays an important role. However, there are no indicators of innovative development of the ICT sector. In order to assess the management of innovation processes in the field of ICT, the author selected a number of international indices that reflect the state of management of innovation



processes in countries and the results of management in the field of ICT.



Figure 2. Formation of an integrated indicator of effective management of innovative processes in the field of ICT⁴

In the management of innovation processes in the field of ICT, the indicators in the structure of international indices are assessed by determining the integral indicator and comparing it with the share of the ICT sector in GDP. It should be noted that the country does not have a perfect index that reflects the management of innovation processes in the country, especially in the field of ICT, one of the reasons is that constantly introduced new technologies are evaluated by new criteria and reflected in different countries.

ANALYSIS AND RESULTS:

The obtained data form the management of innovation processes in the field of ICT based on the indicators of the global index of cybersecurity, the level of readiness for e-government, the level of global innovation development and ICT development. It should be noted that each of these indices to some extent covers the innovative development of ICT in the country, and as a result, these ratings reflect the effectiveness of the management of innovation processes in the ICT sector of the country. By studying these indices, the author developed indicators to assess the effectiveness of innovation process management in the field of ICT and proposed an assessment methodology.

⁴Developed by the authors

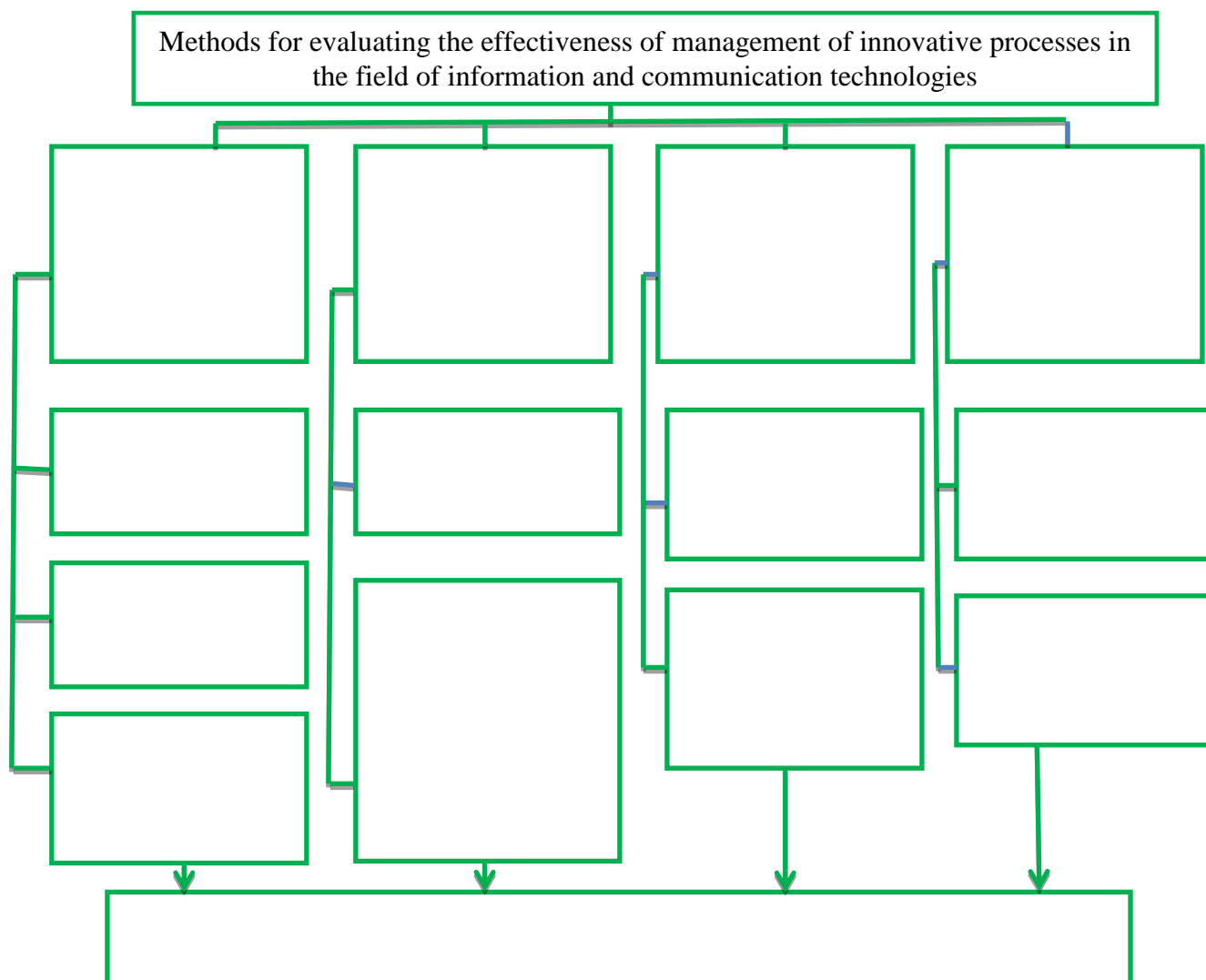


Figure 3. Methods for assessing the effectiveness of management of innovative processes in the field of information and communication technologies in Uzbekistan⁵

Indicators for assessing the effectiveness of innovative processes in the field of ICT in Uzbekistan include indicators of innovative communication, indicators of human capital involved in innovation processes, indicators of digital business, indicators of innovative goods and services.

⁵Developed by the authors



Indicators and methodology for assessing the effectiveness of innovative process management in the field of information and communication technologies were developed by the author and researched in the second chapter of the dissertation.

We can know the management of innovation processes in our country by evaluating the results of innovative activities. In the previous section, we looked at evaluating innovation through global indexes and rankings. Innovative activity in the country is assessed by a number of indicators. In the field of ICT, the dynamics of the development of ICT infrastructure can be cited as a result of the management of innovative processes. This is due to the fact that through the regulation and introduction of innovative activities, many results can be achieved, such as increasing the speed of the Internet, attracting the wider use of Internet and mobile services, the development of digital television, the provision of electronic services.

Table 1

Development of ICT infrastructure in our country⁶

№	Indicators	2017	2018	2019	2020	2021
1	Mobile coverage	45	70	86	96%	98%
2	Broadband coverage of mobile communication	23	44	58	70%	72%
3	Number of mobile users	20.6	21.4	22.8	23.8 mln	24 mln
4	Number of Internet users	17	18	20	22 mln	23 mln
5	Number of mobile Internet users	11	14	17	19 mln	21 mln

⁶Based on data from the Ministry of Information Technologies and Communications of the Republic of Uzbekistan



As for the results of 2021, mobile coverage has reached 98%, while broadband coverage has reached 72%. The number of Internet users has also exceeded 23 million to date, despite a slowdown in growth in recent years.

As a result of the research, the current situation was analyzed in accordance with the methodology proposed by the author to assess the effectiveness of management of innovative processes in the field of information and communication technologies.

Table 2

Current situation analysis on the methodology for assessing the effectiveness of management of innovative processes in the field of ICT⁷

T / r	Indicators	2017	2018	2019	2020	2021
1	Innovative communication indicators	6	6.5	8	10.5	11
2	Indicators of human capital involved in innovation processes	5.5	5.5	5.5	5.5	7.5
3	Digital business indicators	5	5	5	6	6
4	Indicators of innovative goods and services	5.5	5.5	5.5	6	7
5	Integral indicator	22	22.5	24	28	31.5

The table below provides an analysis of the current situation in the field of ICT in the field of innovation process management effectiveness assessment methodology. According to the methodology proposed by the author, the integral indicator for the current situation is 31.5.

In foreign countries, ICT indicators are reflected in many international rankings of the country and determine the level of development of the country. At the same time, the share of the ICT sector in the country's GDP reflects the level of development of the country. A comparative analysis of these indicators is given in the table below. (Table 3)

⁷Analyzed by the authors



Table 3

Analysis of ICT rankings in foreign countries and the share of ICT in GDP

States	2017		2018		2019		2020		2021	
	U _{yaim}	X _{ro}	U _{yaim}	X _{ro}	U _{yaim}	X _{ro}	U _{yaim}	X _{ro}	U _{yaim}	X _{ro}
Korea	11.8	3	12	3	12.3	4.3	12.5	4.6	12.7	5.3
United States	6.8	8	7.4	6.3	7.7	6.3	8.2	6	8.6	6.3
United Kingdom	6.9	10.3	7.1	10.6	8.6	11.6	0.7	11.3	12.4	11
Sweden	7	6.6	8.6	7	8.8	4.3	9.1	4	9.2	5.5
Finland	7.9	12.6	8.3	12.3	8.7	11	8.9	11	9.1	15.3
Denmark	4.8	47.6	5.3	46.6	5.6	44.6	6.1	45.6	6.6	43.6
Germany	4.1	40.3	6.3	41	8.15	41	8.45	41	8.6	42.6
Russia	2.1	103.5	2.5	103	2.8	98	2.8	96.6	3	95.3
Kazakhstan	2	53	2.1	53.3	2.8	55	3.1	56.6	3.9	52.6
Uzbekistan	1,2	91.5	1.5	87.5	1.7	88	2.2	88	2.3	91.6

Note: here

It is its_{share} in GDP

X_{ro} -Average place in international rankings

The analysis of the rating indicators of the ICT sector in foreign countries and the share of the ICT sector in GDP shows that the internationalThe share of the ICT sector in the country's GDP is also high in the countries ranked high in the rankings.

The author analyzes the share of ICT in GDP in the country and international rankings. (Table 4).



Table 4

**Analysis of integrated indicators of effective management of innovative processes
in the field of ICT⁸**

Show small	GII	IDI	EGDI	GCI	Integral indicator	GDP billion	ICT share%	GDP
2017	2 1, 80	4.48	0.48	0.27	6 , 75	81,779	1,2	
2018	2 2, 49	4.90	0.56	0.27	7, 05	59,16	1.5	
2019	2 3, 12	4.90	0.62	0.46	7, 2 7	50,393	1.7	
2020	2 3, 84	4.92	0.66	0.56	7, 49	57,921	2.2	
2021	24.54	4.95	0.69	0.66	7.71	60,374	2.3	

The authors conducted a series of analyzes to study the management of innovation processes of Uzbektelecom JSC as an object of research and the impact of investments in innovation on the net profit of the company. Net profit (u) depends on a number of factors that affect it, including innovation processes. Using correlation-regression analysis, we analyze the factors influencing innovation processes and, ultimately, the positive or negative impact of innovation processes on net profit.

⁸Developed by the authors



Table 5

Forecast indicators on the methodology for assessing the effectiveness of management of innovative processes in the field of ICT⁹

T / r	Name of indicators	2022	2023	2024	2025	2030
1	Innovative communication indicators	14.7	15.5	18.5	20	22
2	Indicators of human capital involved in innovation processes	7.5	8	9	15	23
3	Digital business indicators	11	13	15	15	20
4	Indicators of innovative goods and services	7.5	9	14	16	22
5	Integral indicator	40.7	45.5	56.5	66	87

According to the forecast, the integrated indicator in 2030 will be 87 points, which is an increase of 2.5 times compared to the current situation.

As a result of managing the innovative activities of Uzbektelecom JSC, the authors have developed forecast indicators of net profit until 2030.

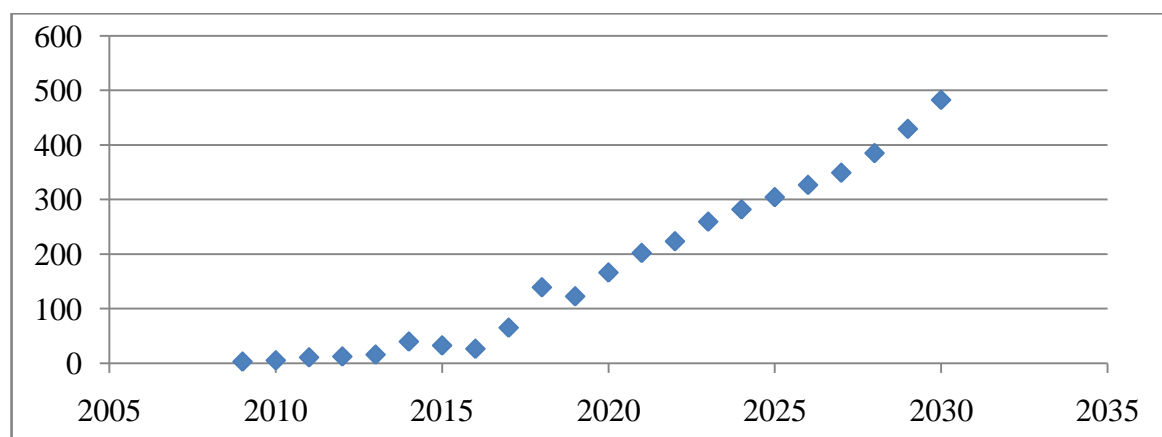


Figure 4. Forecast indicators of net profit of Uzbektelecom JSC until 2030¹⁰

Figure 4 shows the forecast of net profit of Uzbektelecom JSC until 2030. In 2030, net profit will increase 2.8 times compared to 2020.

⁹Developed by the author

¹⁰Developed by the author



CONCLUSIONS AND SUGGESTIONS:

It can be seen from the regression model that the net profit of Uzbektelecom JSC depends on the amount of investments in innovations. If innovations are not introduced into the company's operations, net profit will decrease.

“ Information and communication technologies in Uzbekistan **The authors** proposed a model for the formation of a group of indicators that are sources of information in the provision of information at each stage of the management of innovation processes in the field of information and communication technologies and used to monitor the management of innovation processes .

In this model, the following indicators are used for monitoring:

1. Indicators of the stage of problem identification and formation of an innovative idea:

- Analysis of online applications and problem identification;
- study of competitors;
- Analysis of the activities of foreign companies;

2. Indicators of the stage of development and preparation of technical documentation:

- Percentage of innovation process management concept planning;
- Percentage of development and organization of the management concept;
- Percentage of documentation to start the implementation of innovation processes;

3. Indicators of the management phase of the implementation of innovation processes:

- Choosing the form of management of innovation processes - the formation of a working group and the appointment of officials;

- Control and regulation of innovation processes;
- Presentation of the results of innovative processes in production;

4. Indicators of presentation of results of innovative processes:

- launch the demo version;
- conducting marketing research in test mode;

5. Technology transfer and commercialization indicators:



- determine the directions of public presentation;
- attract investment in transfer and advertising costs.

Management of innovative processes of Uzbektelecom JSC determines the directions of their future efficiency:

1. Mastering new technologies. Leadership in transport networks, network ownership and information technology infrastructure.
2. Development of innovative products and services. Unified content management system: cloud technologies, distributed infrastructure services and other similar modern services.
3. Innovations in management. Increase competitiveness in the global market and reduce large costs.
4. Energy efficiency and ecology. Leadership and high social responsibility in cost management.

The stages of the roadmap for the management of innovation processes of Uzbektelecom JSC will be implemented in three stages.

Step1. System formation. Implementation period is 2021-2023. During this period, the company will modernize the material and technical base, make changes in the organizational structure of the company, improve production and services, develop a system of employee incentives, develop and implement innovative processes and related information. measures will be developed.

Step2. The stage of achieving results. Implementation period is 2023-2025. This stage includes the effective use of existing opportunities, the training of personnel with the skills and competencies to work with competitive, modern equipment and technology, the integration of science and industry, as well as cooperation with foreign companies.

Step 3. The transition to a new era. Designed for 2025-2030.

A software product of the methodology for assessing the effectiveness of innovation process management in the field of ICT has been developed. This software product allows you to manage and monitor innovation processes. These indicators allow us to monitor the dynamics of changes in the results of innovation process management each year.



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