Information technology

Last year, the ICT industry demonstrated positive performance, demonstrating growth in all areas. From 2020, demand for the services of the Company's commercial data centers remained high. Cloud services also remained the most popular. The total share of revenue in the ICT sector in 2021 was KZT17.4 billion, an increase of 57% compared to 2020.

Revenue drivers continue to be infrastructure lease services, placement of client equipment and servers in the network of Kazaktelecom Data Centers and a number of cloud services, such as the virtual Data Center (VDC) and security services.

Income from ICT services of Kazakhtelecom JSC

million KZT

Plan	16,611
Actual	17,427

2021	17,427
2020	11,103

Approved Income plan for ICT services in 2021 was completed on

105% (+816)

million KZT

Growth in revenue from ICT services in 2021 amounted to

+57% (+6,324)
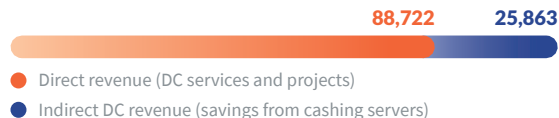
million KZT

Average margin of ICT services

~51%

Basic services for DC	45%
CMSTN project services	51%
IaaS	55%
SaaS	33%
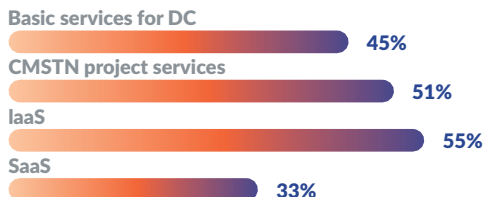
Investment in data center (DC) for the period 2010-2021 paid off by

2.6 times

88,722   25,863

● Direct revenue (DC services and projects)
● Indirect DC revenue (savings from cashing servers)

Total: Income from CD sellings — **KZT 114 585 million**
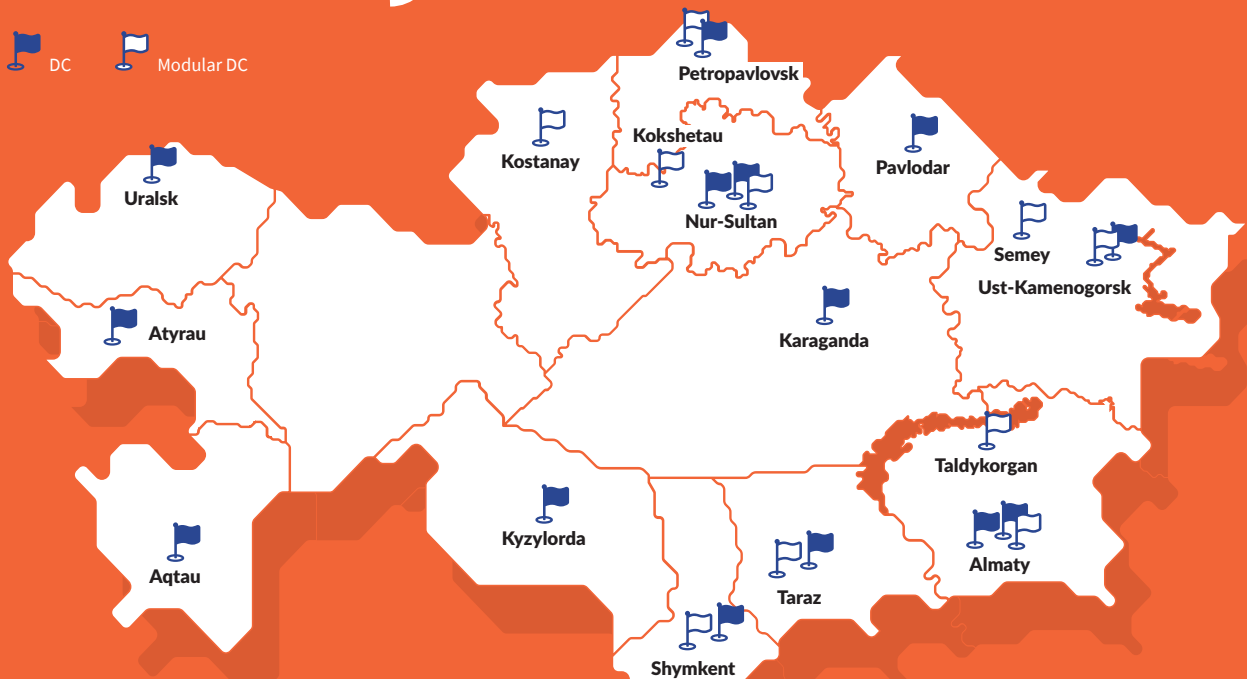Total: Investment projects in CD — **KZT 44 420 million**

Development of a network of data centers

2021 allowed the Company to expand its development horizons and strengthen its position as a leading player in the information storage market. Back in 2020, the accelerated adoption of remote models of interaction and work, as well as the introduction of a full range of technologies allowing the public sector and companies to work in the new environment, showed the importance of having a high-quality and reliable infrastructure, including in terms of storing and processing large amounts of data.

Kazakhtelecom JSC currently has the largest network of 25 Data Centers across the country and offers about 50 different services for the business, from server lease to IT outsourcing. The data centers of the telecom operator holding the largest share of the data storage and processing market are chosen by state companies, large domestic and foreign business. Kazaktelecom Data Centre also has the infrastructure of such giants as Google, Facebook, Akamai, Youtube, Megogo, Wargaming, etc.

DATA CENTERS

DC   Modular DC

Uralsk

Kostanay

Petropavlovsk

Kokshetau

Nur-Sultan

Pavlodar

Semey

Ust-Kamenogorsk

Atyrau

Karaganda

Aqtau

Kyzylorda

Taldykorgan

Taraz

Almaty

Shymkent

25
Dana centers

~1,500
stances

98%
current utilization

OUTLOOK FOR 2022-2023:

LaunchingCD cloud TIER II/III in Almaty for 126 stances.

Expanding CD in Akkol for 106 stances.

Developing of cloud services on the vertical resources basement across Kazakhtelecom JSC and partnership solutions.

One of the strategically important areas last year was the launch of a new modular DPC in Almaty with a capacity of 168 seats with a total area of 180 m2. It consists of several finished structures, which were installed and completed at the construction site. In addition, the Data Center uses a convenient control and monitoring system: the racks are installed in separate boxes with a large physical capacity of 50 units, as opposed to the standard capacity of 42 units.

In order to ensure safety and efficiency of operation, a modern air conditioning system is used in the modular DPC, which makes it possible to reduce electricity consumption costs. External power supply to the DPC is provided from different sections of the same distribution substation along two independent lines. Two diesel generators have been installed for backup power supply to the Data Center. In order to ensure their reliability, a system of automatic inclusion of provisions is stipulated.

Thus, the increased capacity of the data center (3.3 MW) and the high level of protection, and therefore the increased level of fault tolerance, make it possible for companies and entrepreneurs in Almaty to quickly implement digital projects at virtual facilities without overpaying the long-distance data transmission channel.

In view of the needs of clients, the Company provides the opportunity to use the resources of this data center not only to host physical equipment, but also to lease virtual infrastructure (the "Virtual Data Center (VDC)"), thereby focusing on the development of virtual and cloud services.

It is important to note that another 100-seat data center in Kosshi, Akmola oblast, was also launched in 2021. This center ensures the efficient operation of all information systems of the Samruk-Kazyna Group of Companies, and also allows Kazakhtelecom JSC to significantly expand the volume of its clients "services. The technological specifics of the new data center will significantly reduce the occurrence of unforeseen failures in the data center infrastructure, thereby ensuring the security of information systems and increasing the quality of service.
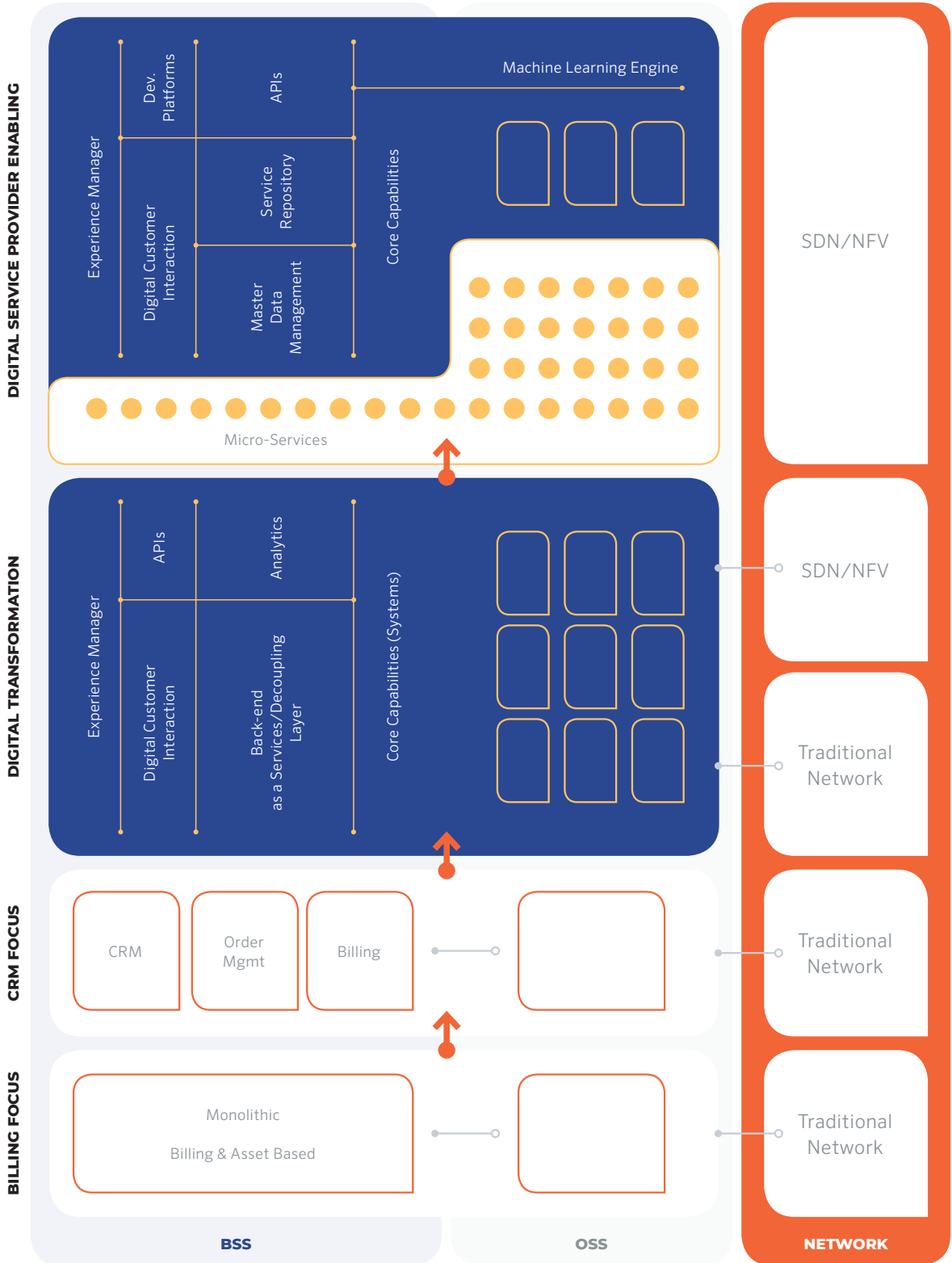
Kazakhtelecom JSC does not stop at the results achieved and plans to continue developing in this area. This year plans to modernize the existing Data Center in Akkol with an expansion of its capacity to 106 desks, and also to perform preliminary work to resolve a number of issues on the further construction of the TIER4 modular data center in Nur-Sultan.

Infrastructure and IT architecture development

2021 was a busy year for the Company's IT business. The panemics have had a huge impact on the development of digital trends, accelerating their growth and forcing business. Over the past two years, the Company has fundamentally changed its client relations formats, and has introduced new digital solutions, which increasingly required a flexible and scalable IT infrastructure from the IT department of Kazakhtelecom JSC, which is the foundation for any digital transformation.

One of the important results of the past year was the transition to a micro-service IT architecture and the implementation of the Development and Operation (DevOps) practice. The recommendations of the international non-profit organization TeleManagement Forum (TM Forum) were used as the basis for the changes and transition to the micro-service architecture, bringing together nearly all the world's telecom operators, providers, system integrators, suppliers of equipment and software. Today this figure is 775 companies from 195 countries.

Transformation stages

DIGITAL SERVICE PROVIDER ENABLING

Machine Learning Engine

Experience Manager

Dev. Platforms

APIs

Digital Customer Interaction

Service Repository

Master Data Management

Core Capabilities

Micro-Services

DIGITAL TRANSFORMATION

Experience Manager

APIs

Analytics

Digital Customer Interaction

Back-end as a Services/Decoupling Layer

Core Capabilities (Systems)

SDN/NFV

Traditional Network

CRM FOCUS

CRM

Order Mgmt

Billing

Traditional Network

BILLING FOCUS

Monolithic

Billing & Asset Based

Traditional Network

SDN/NFV

BSS

OSS

NETWORK

Tomorrow

Today

Yesterday

Kazakhtelecom JSC

The application of the TM Forum methodology and standards allows the Company to increase business efficiency through the optimization of business processes, as well as to transition to a more efficient IT architecture by transferring the entire IT landscape of the Company, including equipment, software and information systems, to a single ABACUS system. This system is a software package used to model the Company's IT architecture. All changes to the Kazaktelecom IT environment are now displayed online in the ABACUS system.

In this way, centralized and continuous development of digital architecture makes it easier to interact not only within the Company, but also to apply to work with clients, developing new digital service channels.

A number of meetings with leading global experts were also held to further modernize the Company's IT architecture. We note separately the consulting company Detecon, which is a subsidiary of T-Systems International, the key brand of Deutsche Telekom, and the international consulting company McKinsey & Company, which specializes in strategic management. In future, Kazakhtelecom JSC plans to adopt their practices and experience in this area.

All the Company's initiatives are aimed at a phased transition to a micro-service IT architecture. In 2021, 15 of 43 information systems were transferred to micro-services. This process will continue. The work performed will allow the Company to accelerate the release of new

Target IT architecture
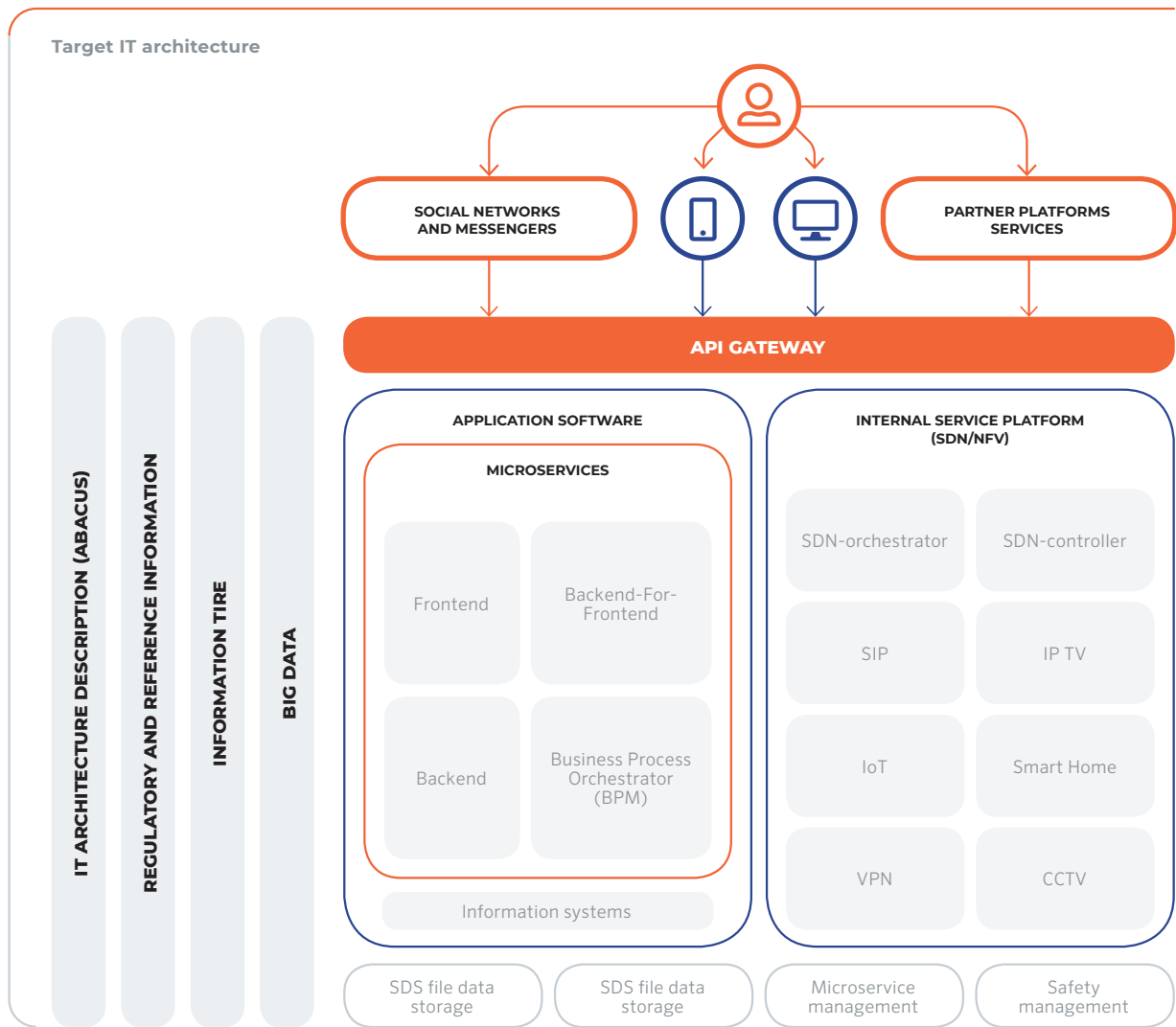
products and services in digital format, improve their quality, and also to more actively respond to client needs in accordance with the new time to market requirements.

Whereas previously development took three to six months, now only three to six weeks will be required with the transition to a micro-service architecture. Accordingly, the time for new services and services to enter the market is reduced. In other words, the Company can quickly implement business ideas and put them into full-scale operation.

In order to apply best practices and ensure the support and operation of IT resources at the level of world

standards, the IT function of Kazakhtelecom JSC is now facing the strategically important task of certification for compliance with the ISO/IEC 20000 international standard.

This is the first international standard to manage the quality of IT services. This certificate will make it possible to obtain an independent assessment of the quality of provision of services and services used by the Company from global practices. This year, IT plans to implement IT service management standards and change existing processes in accordance with the requirements of this standard. It is planned to complete the audit process and obtain international certification in 2023.

Transition to a divisional management structure and key IT focus areas

One of the most important events of 2021 for the Company's IT department is the integration of all structural IT divisions into the IT Division (hereinafter the ITD), and also the creation of a Data Factory on the basis of the Division. This initiative made it possible to improve the structure of the Company and determine a further Work Development Plan, including in the area of Big Data.

It is important to note that the volume of data accumulated by Kazakhtelecom JSC is growing rapidly, and only the proper use and analysis of these data allow the Company to gain a great competitive advantage in the market.

The creation of the Data Factory at Kazakhtelecom JSC has become a strategically important project and the main focus of ITS development for the upcoming period. Today, this

function processes a large volume of information, and on the basis of analytics it builds behavioral hypotheses that will be used in future to provide clients with the opportunity to choose personalized services and products.

In addition, as part of the current digital transformation program, the Company's IT function is also focused on such priority tasks as technological breakthrough, maintenance, world-class support of IT infrastructure and implementation of the ZeroTrust concept, including several information security technologies and processes. The implementation of these focus areas will significantly accelerate internal processes, ensuring the necessary level of reliability and flexibility. The ultimate goal of the Company is to achieve a level of quality in which both clients and employees are satisfied.

Digitalization of client routes B2B and B2C segments

In 2021, Kazaktelecom IT continued to improve digital service for retail and corporate clients through the telecom.kz and ISMET.KZ portals.

For example, in order to service clients of the B2B corporate segment, the ISMET.KZ portal implemented the functionality of submitting requests to eliminate damages for authorized

and unauthorized users. Thanks to the new functionality, the Company's clients can promptly submit service requests for repairing damages, monitor their performance status online, and accurately geo-position of the monter, who is also responsible for repairing damages.

As part of the performance of the B2B segment's focus tasks, a personal account was implemented on the ISMET.KZ portal, through which entrepreneurs from rural areas of the country can apply for partnership with Kazakhtelecom JSC, enter into digital contracts online, issue orders for the development of technical specifications and deploy the network in population centers at their location.

In addition, a new functionality for corporate clients "I Want the Internet" was implemented on the portal in 2021. The Company's clients can now check the availability of the technical possibility to connect the Internet service to the required address, select services from the recommended tariff plans, perform an automated service order, conclude contracts or supplemental agreements online, obtain order statuses on a timely basis, select the date of installation work, and track the exact geo-position of the monter responsible for technical work.

Another result of last year's work is the integration of the ISMET.KZ platform with the platform of the OFD fiscal data operator. Together with colleagues from the Corporate Business Division, work was performed to ensure the functionality of electronic document flow for the clients of the OFD through SSO and an increase in the number of clients on the digital channel.

As part of the work on upgrading the ISMET.KZ mobile application, the main functionality of the web version of the portal was transferred to the application, and the possibility of registering the cash register integrated with the OFD system was implemented. To date, the mobile application has developed functionality for accepting all types of requests and applications from clients of Kazakhtelecom JSC.

It should be noted that last year a number of innovations were also implemented for clients of the B2C retail segment on the portal telecom.kz. In particular, the process of registration and authorization of portal users has been simplified to the maximum extent possible, the interface of the menu and settings of the user account has been updated, the functionality of connecting/turning off additional services and services in one click has been expanded, such as TV+ and Telemedicine, and the view of extended information on offers and names of tariff plans has been expanded.

At the same time, new types of requests from the Company's clients have been digitized. Online subscribers can now assess the quality of provision of basic services and submit an application for withdrawal of a particular service. The possibility to go through the NPS survey directly in your mobile and web versions of the portal has also been developed.

In addition, through the use of big data accumulated by the Company, a mechanism for NPS survey of users of Kazakhtelecom JSC has been launched through SMS newsletters. This tool allows employees of the retail and corporate business to independently supplement the Q&A structure of the questionnaire.

As part of the launch of the new TV+ service and public access points eQoldau the Company's IT specialists also developed landing pages on Kazakhtelecom JSC corporate portals.

The main achievement of the previous year was the integration of the telecom.kz and ISMET.KZ portals with state authorities and the Ministry of Digital Development, Innovations and Aerospace Industry of the Republic of Kazakhstan, the State Database "Individuals", and the Ministry of Justice of the Republic of Kazakhstan.

Plans and objectives for 2022

This year, the IT department plans to continue work on improving client routes through digital channels and services on the Company's corporate portals. To do so, additional focus areas and tasks for the upcoming period have been determined.