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# Digitalisation of Company's Communication With Customer Markets in the Russian Arctic Zone

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**ABSTRACT**
The article presents a case study of a big company operating in the Russian Arctic Zone in order to explain the need for digitalisation of communication between resource suppliers and customer markets. Currently, the main way of communication between the company in question and its customer markets is contractual relations. Their timeliness and quality are becoming particularly important, especially for big businesses. The quality of a resource supply contract directly affects the completeness of the resource supply and performance of the schedule agreed in the contract. Contract performance directly influences the financial and economic performance of the company and, consequently, its competitiveness on customer markets. A contract as a main communication tool is the critical legal instrument, regardless of the annual number and scope of contracts. It applies to various contracts, from several big orders for companies (enterprises) on sectoral customer markets to tens of thousands on a consumer market reaching individuals and households.
***Keywords:*** *digitalisation, Arctic Zone, communication, client market, contractual relations*

## 1. INTRODUCTION

Transition to a digital economy or digitalisation of all activities is prioritised by the Russian Government and President as a strategic development vector for socioeconomic processes [1, 2].

The Kola Branch of the Atomenergosbyt Corporation is one of the biggest companies in Murmansk Oblast, a region located in the Russian Arctic Zone. The company supplies electricity to two customer markets: industrial enterprises and the public. The main goal of the company is to provide electricity in full and on time to the consumer market, i.e. individuals and households, and to the sectoral markets, i.e. legal entities, and ensure efficient energy distribution in each of the customer markets in the Russian Arctic Zone.

The subject is relevant because improvement is needed for information support to the company as a whole and its branches, including the Kola Branch. Digitalising the document flow will help make contractual relations with customer markets more efficient. The main goals of digitalisation is to provide continuous availability of the required information stored in the database, reduce the time it takes to sign a contract or make summaries and reports, and create a state-of-the-art database for record-keeping of supervisory activities.

The goal of the study is to explain the need for digitalisation of communication between resource suppliers and customer markets using a case study of a big company operating in the Russian Arctic Zone.

Among the Russian authors interested in digitalisation challenges in the Russian economy, we can note the following: Belous, A. P. [3]; Bodrunov, S. D., Plotnikov, V. A. [4]; Babkin, A. V., Bespalova, S. V., Senetskaya, L. B., Skotarenko, O. V. [5]; Kelchevskaya, N. R., Shirinkina, E. V. [6]; Charykova, O. G., Markova, E. S. [7]; Frolov, D. P., Lavrentyeva, A. V. [8]. Issues of digitalisation of economies are discussed in works by international authors: F. Gault [9]; E. Horváth, S. Klinkmüller [10]; D. Huo, Y. Chen, K. Hung, R. Ouyang, B. Sun, Y. Cai [11]; G. Popescu, F. Cristian Ciurlău [12]; A. Ramaiah [13]; V. Russo [14]; D. Selvaratnam, Z. Embong, K. Keliwon [15]; P. Xie, J. Wu, H. Du [16]; Z. Yin, X. Gong, P. Guo, T. Wu [17]; L. Zhang, S. Chen [18]

Company-based digitalisation of economic processes is discussed in works by H. Pasandideh [19]; A. Willems, M. Kamau [20].

Changes in European and international legislation in a digital economy are described in studies by A. Ting, S. Gray [21]; C. Trenta [22].

## 2. RESULTS AND DISCUSSION

The Atomenergosbyt Corporation was established in 2001 to provide electricity to nuclear facilities in the regions where Rosatom, the State Corporation for Atomic Energy, was present. In 2014, the company successfully performed the task to develop a new activity: supply business. The

main activity of the company (according to OKVED, the National Classification of Economic Activity Types) is 35.14 «Selling electricity». Some of the additional activities include 33.12 «Repairing machinery and equipment», 35.11 «Power generation», and 35.13 «Power distribution».

In 2015, by Order of the Russian Ministry of Energy No 14 of 23 January 2015, the company was assigned the status of the default supplier of electricity in Murmansk Oblast [23].

The main strategic economic goal of the company and its branches is to raise the profitability of its supply business. It has the following strategic vectors or means to achieve the goal: reduce the scope and growth of debt due from the customers, ensure that payment for the energy supplied exceeds the average for the energy market in the Russian Arctic Zone, and develop and implement new products, services, and work on the respective customer markets.

The goals are achievable by reaching the following programme goals:

- standardise the customer support system;
- promote remote and interactive services on the customer markets;
- raise the competence of the customer service employees;
- standardise the work with the debtors;
- advance the activities aimed at optimisation and reduction of the debt due from the customers;
- unify and automate contractual activities with consumers on the customer markets by digitalising the document flow;
- automate the claim and legal action unit in the billing system for debt collection;
- prioritise goals and criteria for the new Smart Home activity. A dynamic for the total amount of electricity consumers on the consumer market serviced by the Kola Branch is shown in the figure. As seen from the figure, the number of legal entities serviced by the Branch insignificantly decreased over the last three years. However, the number of individuals steadily grew over the studied period. In 2018, the company reached 9.8 thousand legal entities and 341 individuals in Murmansk Oblast.

The Kola Branch revenue figures for selling electricity and capacities in Murmansk Oblast in 2016–2018 show that it was 11,865m RUB in 2016 and 12,544m RUB in 2017. The revenue growth was 105.72% compared with 2016. In 2018, the revenue was 13,948m RUB, showing a growth of 111.19% (1,404m RUB) compared with 2017.

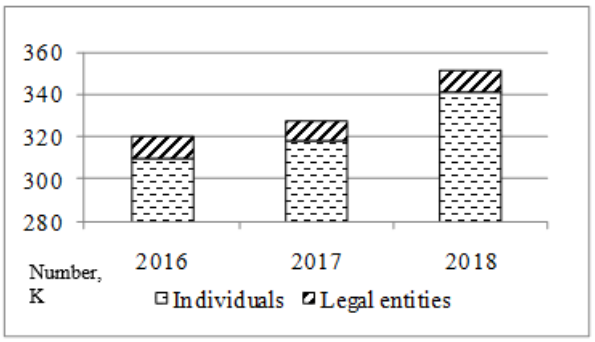


**Figure 1** Number of legal entities and individuals serviced by the Kola Branch in Murmansk Oblast in 2016–2018

The rate of growth had therefore grown from 5,72% to 11.19%, i.e. almost doubled.

Experience has shown that digitalisation and introduction of advanced information technologies is beneficial for any company and its competitiveness on customer markets. The current competition within the sector is medium-level. The Kola Branch is the biggest electricity supplier in Murmansk Oblast, but there are competing companies on the market of electricity supply and distribution. Those are two corporations: Murmanskaya Gorodskaya Elektricheskaya Set and Oboronenergo, as well as Murmanskaya Oblastnaya Elektrosetevaya Kompaniya.

Experts consider it unlikely that new competitors may appear at this sectoral market of electricity resources, since the entry costs are very high. Apart from that, the government management system sets restrictions and imposes regulations on companies

The rate of customers' leaving the company's reach is assessed by experts as medium because the Kola Branch has a considerable capacity to improve its services. It is highly trusted by the target segments of the sectoral and consumer markets because it is the default provider of electricity and capacities.

Experts also assess the strength (degree) of influence from various resource providers on the Kola Branch as medium. However, the company has a high priority for resource providers.

To prevent new competitors from coming up with replacement products, it is necessary to use new service management technologies and digitalisation, raise the quality of service, reduce costs as the power generation increases, set and achieve customer loyalty goals, and encourage activities of intermediaries. It is possible to make up for a certain loss of customers following a marketing study of their needs and reactions to a change in the cost, quality, or properties of a service. It is also necessary to make sure that the Kola Branch is prepared for a timely and adequate response to new needs of the customer markets and fast-emerging demand for services. Despite the high priority level with the existing resource suppliers, the Branch management should analyse their competitive position on the resource and service markets and look for new partners providing the Branch with new

technological, information, labour, financial, and commodity opportunities.

We can therefore conclude that the current competitiveness of the Branch helps it expand its services and increase its share on the customer markets.

An expert analysis of the degree the strengths and weaknesses of the Branch affect its activities has shown that the following opportunities, goals, and activities should be currently prioritised: digitalisation of underperforming contractual relation processes; introduction of state-of-the-art service technologies; increased automation in order to improve major activities and several actions and functions of the staff working with end users.

Importance of the Branch's further development strategies have been analysed to determine their importance factor. The strategies are aimed at adding value and include the following: reducing costs and time (importance factor: 0.36) and increased customer service efficiency (importance factor: 0.16). The analysis has shown that the strategies can be achieved by improving the information support of main business processes (importance factor: 0.39), which includes digitalisation of contractual relations.

The whole process can be divided into four sub-process stages done by the Sales Department and the Contracts Department: «Processing and accounting of application for power supply», «Signing and record-keeping of contracts», «Claims and legal action», «Routine reporting».

The first stage starts at registering applications for power supply services received be the Contracts Department. The applications are assigned a number in the registration logbook in order to track the follow-up work with them.

At the second stage, the registered application serves as a basis for a power supply contract detailing the energy amount and properties, mode of consumption, price, equipment safety and maintenance clauses, and customer number.

The Sales Department calculates and sends the invoices. It also collects customer debt data based on the payment information received from the Accounting.

The debt data are sent to the Legal Department, which uses them to draft claims to be filed to court.

Having studied all of the process stages, we have identified a list of the documents present in the contractual relations (Table 1).

**Table 1** List of documents for contractual relations

| Name | Flow of information |
|---|---|
| 1) Application for power supply services | input |
| 2) Statement of application review | output |
| 3) Power supply contract | output |
| 4) Reporting documentation | output |
| 5) Claims | output |
| 6) Notifications | output |
| 7) Writ of execution | output |

The analysis has shown major time and labour constraints during preparation and submittal of the documents, e.g. most of the claims and legal action activities are done manually, which both extends the procedure and leads to failure to meet deadlines.

In order to determine the sequence of digitalisation of documents and automation of contractual management in the Kola Branch, we have used the ABC (Pareto) analysis method. The analysis has shown that four (67%) documents should be digitalised and automated. They take up 80% of the total document processing.

The quantitative indicators of strategic goals and specific activities in the information support system include the average time it takes to process an application, come up with a decision, prepare the supporting documents, and make reports as well as the number of signed contracts.

The projected distributed information support system aimed at more time-efficient contractual relations, reliability and timeliness of data has to conform to the following requirements:

- flexible and personalised adjustment for each employee of the respective department;
- unification of data processing;
- data backup and restoration to the initial values of a certain work cycle following their modification;
- active information exchange with the existing information system (STEK-Energo calculation and billing system);
- support for reporting to the management;
- scalability and modular design to provide for new modules to be designed and developed without affecting the work logic, data structure, and interaction algorithms of the existing software modules;
- an audit system to control the automated functions, with an error log;
- a united information environment and database for the data now contained in different databases, for the purposes of easy availability of information and eliminating redundancy.

In accordance with the united information environment concept, all elements of the information system have to function under the same rules and principles and unite all of the contractual relations processes. Each task has to start with a certain input document requiring specific

actions: registration, analysis, and decision. Each new action has to follow a strictly-defined sequence, without exclusion of other actions, and cause the next operation to start.

A suggested information system design has to provide for multi-user operation. The client-server technology with a two-tier and three-tier architecture, similar to the existing STEK-Energo architecture, is therefore chosen for implementation.

That architecture conforms to the requirements of reliability, scalability, performance, flexibility, and security.

The main components of the information system to be designed include the following:

– STEK-Energo database containing debtor data (first level);
– digitised paper or electronic documents containing court and financial data (first level);
– united database (second level);
– ASP application receiving user requests for information from employees to be forwarded to the united database and returned with the search results to the users (third level).

Despite the increase in the information system software tasks, the functions of the contractual support staff will not be reorganised. Besides, the expanded software capacity includes storage of full-text documents (contracts, claims, and writs of execution).

In the automated contractual relations system of the Kola Branch, information processing will include collection and registration of input data, data correction in the system, storage of full-text documents, information processing with pre-defined algorithms, and its output.

Information will be collected by manual data entry into the STEK-Energo software complex. Should the user personal data or reference information change, it will need adjustment and recalculation.

If there is a file write or read error, the error code and description is displayed. Writing and reading is done on the all-or-nothing basis: the data are considered transmitted/received when all of the objects have been written without any error.

To ensure integrity and authenticity of the data stored in the system, the project uses the following information checking methods:

– monitoring (visual data check for unacceptable characters upon entry of specific information into the automated information system);
– checksum range or checksum variation (input control using specific checksums);
– syntax check (checking the input data for accurate syntax structures);
– semantic check (assumption of interrelated indicators to be calculated).

All of the documents on the input and output documents list related to contractual relations can be divided into two groups by document form:

1) Documents with a rigid structure and design incapable of modification. Those documents include power supply contracts and court documents (claims, court rulings, writs of execution, enforcement procedure orders, etc.).
2) Documents with a flexible structure and design for internal needs of the Branch. Those are various reports, e.g. company debtors report.

The suggested data check methods will reduce the number system failures and errors.

The project does not aim at complete replacement of hard copies with electronic documents because some input documents will be stored as hard copies, with the required data to be entered into the database manually.

However, one of the main tasks for the information system design was automation of court claims, frequently filed and rigidly structured and designed documents.

The resulting information will be displayed on-screen electronically and as a hard copy at the employee's discretion provided that such a report (table, chart, diagram, etc.) is available in the system.

Introduction of the suggested information system is projected to have a management, social, and economic effect.

The expected management effect is expressed in reduced time loss, faster availability of analytical information, fewer errors in record-keeping, higher reliability of information, lower workload of department staff, reduced paperwork, and, consequently, an improvement of the general management culture.

The social effect can be expressed in increased stability of the Branch's operation, which results in job security and higher quality of service.

The economic effect is expressed in its respective monetary equivalent. To calculate it, we have to assess the amount of time reduction in managing the Branch's contractual relations (in particular, claims and courts) and the resulting cost-saving.

The current time consumption by department staff can be reduced by expanding the functions of the STEK-Energo software complex. The project solution will therefore help find additional time for different, more complex operations. The labour efficiency is projected to increase because of the reduced labour input for document processing, reporting, and compliance.

Table 2 shows a comparison of the labour input for the base and suggested option and a calculation of labour input for each indicator.

Table 2 demonstrates that introduction of the contractual management subsystem will reduce the labour input by 120 hours a month, with the hourly wage of a legal action department employee being about 170 RUB.

Thus, the yearly cost-saving (CS year) from the operation using the designed information subsystem will be:

CS year = 120 hours × 170 RUB × 12 months = 244 800 RUB (1)

No staff will be laid off because the extra time saved by the labour input reduction will be used for analytical tasks.

**Table 2** Labour input

| Process | Labour input, hours/month | | Labour input reduction, hours |
|---|---|---|---|
| | base option | suggested option | |
| Processing input documents | 231 | 198 | 33 |
| Reporting | 120 | 94 | 26 |
| Making court claims | 265 | 204 | 61 |
| Total | 616 | 496 | 120 |

We can therefore calculate the expected annual cost efficiency (CE year) of the project implementation, given the annual cost-saving (CS year) of 244 800 RUB, the annual information system support costs of 50 000 RUB (SC year), and the lump one-off cost (LC) of 157 600 RUB, using the formula:

CE year=(CS year - SC year): LC(2)

CE year=(244 800–50 000):157 600=1,236 RUB/RUB (3)

The expected breakeven period (BP) of the project as the inverse value of the cost efficiency is calculated using the formula:

BP = 157 600 : (244 800 – 50 000 ) ≈ 0.809 yr (4)

Thus, the project will break even in about ten (9,71) months.

## 3. CONCLUSION

In the context of the study, we should note that timely contractual relations help develop the company, create product turnover, build industrial, financial, economic, and social capacity, and satisfy a growing resource demand on customer markets. The growing demand is due to the strategic goal of accelerated development of the Russian Arctic Zone by building new industrial facilities and infrastructure and raising investment for the existing traditional economic sectors. A digitalised contractual relations system gives the company the opportunity to avoid threats, such as economic losses and opportunity costs, and avoid the risks caused by errors and ambiguities in relevant documents. It will significantly reduce default penalties and manage the debts due from the customers and payment deadlines.

That is the reason why digitalisation of the contractual management process in the existing market economy is a priority goal of the management system as a whole. Using technical means, databases, and software for timely and efficient information processing will also help make contractual relations more accurate and less time-consuming.

## 4. CONFIRMATION

The validity and reliability of the study findings is due to using actual input data and modern study methods to assess the expected management, social, and economic effect. The accuracy of the findings has been established by a statistical analysis of the data during the calculation experiment as well as by approbation of the findings in university studies and comparison with the theoretical assumptions and previous studies.

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