

Innovative Development of Telecommunications and Supply Chain Management in Kazakhstan

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Abstract - In telecommunications, there are fundamental changes occurring around the world due to deregulation, new competition and fast innovation. The supply chain offers communication companies watching this change not to eat them the unused weapons to increase competitiveness. In modern conditions of socio-economic development of the Republic of Kazakhstan, one of the main areas is the development of the regional economy, in the context of which the most promising area is the telecommunications system and supply chain management, since the level of competitiveness of local enterprises depends on the introduction of innovations into the global economy. This article provides a literature review of local and foreign authors who conducted research on the issues of innovative development of the Republic of Kazakhstan, including developmental patterns and characteristics of telecommunication systems and the strategies of supply chain management. An economic assessment of the current state as well as innovative development of telecommunications in Kazakhstan are given. As a result of the conducted research, the economic aspects of the research of the supply chain management in telecommunication sphere at the regional level were systematized, on the basis of which the relevant conclusions were made. In telecommunications, important functions of supply chain management are information synchronization and optimization of the management process. Synchronization means that information can be spread throughout the supply chain, while participants in the chain can keep pace with the changing demand.

Key words - national economy, innovative development, telecommunications system, regions, market share, supply chain management.

1. Introduction

Modern world development is characterized by transition to a new stage in the formation of society - the development of the economy, the basis of which is generating, distributing and using innovations. Innovations and innovation activities of enterprises in recent years have acquired particular importance in the socio-economic development of society.

The establishment of the national economy, which indicated the need for the development of innovative supply chain management (SCM) approaches the unresolved problems concerning the most important factor of economic growth made the study of production resources an important component of a particular priority industry - telecommunications systems, studying the modern strategies SCM на enterprise management process based on innovation. The development of telecommunications and SCM in the modern world are a key factor in improving the competitiveness of the country.

At the moment, significant importance must be given to the development of telecommunication systems in the context of world trends at the regional level.

As a result of these evolving changes, organizations are now discovering that improvements to internal processes are not enough. Organizations must therefore get more involved in the management of their supply chain network of all upstream firms that provide the inputs as well as the network of all downstream firms that provide the outputs of the product to the final end customer.

2. Literature review

The concept of supply chain, SCM, and now global supply chain management (GSCM) can no longer be defined at a local level and must be defined in terms of a global network of information systems integrated to include both upstream supplier networks and downstream distribution channels [1].

Unprecedented growth viewers and hasplayed a pivotal role in increasing growthhas invited participation of global telecom service providers in strengthening the telecom service supply chain connecting global customers with cross-boarder information sharing, uniting global networks resulting reduced cost of quality telecom services [2].

Examined the telecom service supply chain's performance under different coordination strategies involving risk and information sharing between the Application Service Provider and the Application

Infrastructure Provider and suggested an effective decentralized mechanism to achieve the goal of maximizing the overall supply chain performance [3].

In the modern academic literature of foreign authors, a lot of attention is paid to the issues of modern management of the region and its enterprises as well as the introduction of innovations from different positions of economic development, for instance:

Arthur A. Thompson Jr., A. J. Strickland III. [4], Jean-Jacques Lambin [5] investigated the issues of strategic management, concept and situation analysis of enterprise activities.

Michael E. Porter [6] studied issues related to competitive strategy, on the basis of which he proposes his own method of analyzing industries and competitors.

Patrick Vigeri, Sven Smith, Merdad Bagai [7] investigated the features of business growth based on innovative management approaches.

Damianova, L.T. [8] the article presents the analysis and evaluation of innovation activities in Bulgaria. It considers the place of Bulgaria in various international rankings based on its innovative ability and technological development; it analyzes innovation activities of the Bulgarian companies; it identifies the existing problems and obstacles to innovation; it determines the prospects for development and elaborates recommendations for improvement of innovation activity in the country.

Robert T. Kiyosaki, Donald Trump [9] identified the patterns and prerequisites of modern thinking entrepreneurs in the field of innovation.

Azher Parvez, Satyanarayana Chary [10], Ravi Kumar [11] studied the issues of telecommunications management at the current stage of national economy development.

Russian researchers: Belov M., Novikov D. [12], Sharikov AF, Babenko V.A. [13], Akmaeva R.I., [14], Rodionova V.N., Fedorkova N.V., Chekmenev A.N. [15] and others, conducted research in the field of modern management and innovative approaches and mechanisms of enterprise management, and others.

Kazakhstani scientists-economists: Alimbetov U.S., Zaynelova G.Z., Krause N.V., Turdieva Z.M. [16], in conducting an analytical assessment, revealed weaknesses and problems in the functioning of the national innovation system and paid attention to finding ways to improve it; Kirdasinova K.A., Tolysbayev B.S., Sabirov R.K. [17] in their studies revealed the conceptual nature of the national economy of Kazakhstan; Daribekov S.S., Akbaev E.T., Mukashev T.A., Erzhanova S.K. [18] studied and conducted an economic analysis of the current state of the telecommunications industry of the Republic of Kazakhstan; Tazhibekova K.B., Hishaueva ZH.T. [19] explored current issues of regional economic development and others.

The analysis of qualitative and quantitative case data and the use of a system dynamics model revealed a number of factors influencing the increase and decrease in service. These factors include the need to

expand the supply chain of services, the bias leading to unrealistic assumptions about scalability and problem solving, the rejection of solutions, the launching of digital services in a beta form, the lack of transparency of opportunities and the lack of training [20].

Nevertheless, the analysis of publications shows that there is a lack of research in this particular area, therefore, the author's research is aimed at studying cutting edge methods and mechanisms in supply chain management from the perspective of innovative enterprise activities.

3. Methods

One of the current research methods in the field of innovative development in SCM is a market share analysis.

As part of the analysis of the market share occupied by the Aktobe branch of JSC «KazTransCom» in the existing business centers in the city, it was revealed that for the period of November 2016 the penetration level was 14%, which is 87 customers out of a total number of lease holders 637 units. In May 2017 during the re-analysis of the proportion in the city's business centers has increased by 3% and amounted to - 17%, it is 111 customers out of 638 existing lease holders (Figure 1).

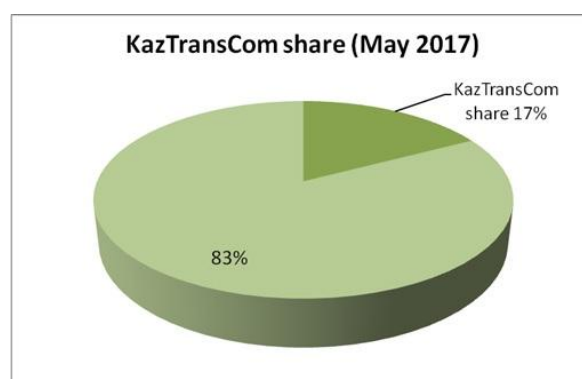


Figure 1. Market share of JSC «KazTransCom» in Aktobe (note: Source: developed by the author)

More detailed information is presented in the context of Aktobe business centers for the periods of November 2016 and May 2017 in tables 1, 2 and in Figure 1, 2.

Table 1. The number of connected clients in the business centers of Aktobe for the period November 2016.

	Name of the object	November 2016		The market share of KazTransCom JSC
		Total number of tenants	KazTransCom JSC	
1	BC "PROGRESS"	37	5	14%
2	BC "Dastan"	20	2	10%
3	BC "Renaissance"	16	0	0%
4	BC "Geobasis"	18	13	72%
5	BC "Capital Plaza"	55	26	47%
6	BC "Grand"	25	0	0%
7	BC "MATRIX"	31	0	0%
8	BC "Dom byta"	51	0	0%
9	BC "Kazyna"	11	9	82%
10	BC "Transenergo"	4	3	75%
11	BC "Mir"	50	0	0%
12	BC "Asan"	14	0	0%
13	BC "Alatau"	90	10	11%
14	BC "POSH"	76	11	14%
15	BC "Sun Sity"	33	3	9%
16	BC "Office Land"	9	0	0%
17	BC "Batys"	13	1	8%
18	BC "Tenke Capital"	11	0	0%
19	TK "CITY" и BC "Dastan Optimum"	45	1	2%
20	LLP "Samson"	11	1	9%
21	BC "Astoriya"	17	2	12%
TOTAL		637	87	14%

Note: Source: materials adopted from JSC «KazTransCom» (2017)

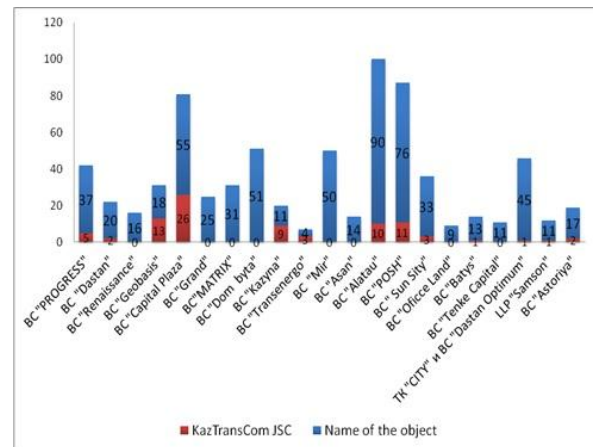


Figure 2. Market share of JSC «KazTransCom» in the context of Aktobe business centers for the period of November 2016 (Note: Source: materials adopted from JSC «KazTransCom» (2017)

Table 2 The number of connected clients in the business centers of Aktobe for the period of May 2017.

	Name of the object	May 2017		The market share of KazTransCom JSC
		Total number of tenants	KazTransCom JSC	
1	BC "PROGRESS"	38	6	16%
2	BC "Dastan"	20	2	10%
3	BC "Renaissance"	16	0	0%
4	BC "Geobasis"	19	16	84%
5	BC "Capital Plaza"	55	32	58%
6	BC "Grand"	25	0	0%
7	BC "MATRIX"	31	0	0%
8	BC "Dom byta"	51	0	0%
9	BC "Kazyna"	11	9	82%
10	BC "Transenergo"	4	3	75%
11	BC "Mir"	50	0	0%
12	BC "Asan"	14	0	0%
13	BC "Alatau"	89	17	19%
14	BC "POSH"	76	14	18%

15	BC "Sun Sity"	33	3	9%
16	BC "Office Land"	9	0	0%
17	BC "Batys"	13	1	8%
18	BC "Tenke Capital"	11	0	0%
19	TK "CITY" и BC "Dastan Optimum"	45	1	2%
20	LLP "Samson"	11	0	0%
21	BC "Astoriya"	17	7	41%
TOTAL		638	111	17%

Note: Source: materials adopted from JSC «KazTransCom» (2017)

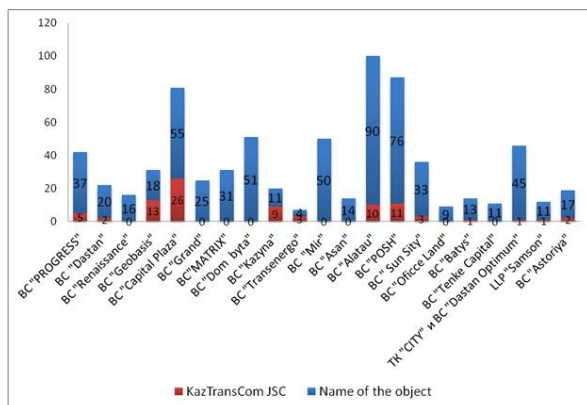


Figure 3. Market share of JSC «KazTransCom» in the context of business centers in Aktobe for the period of May 2017 (Note: Source: materials adopted from JSC «KazTransCom» (2017))

Summing up, within the period of November 2016 and May 2017, 24 more clients were connected to our services, which increased the share of presence in the business centers of Aktobe.

In the context of each individual business center, the market share of the Aktobe branch of JSC «KazTransCom» varies from 0% to 84%. The zero figures are related to the fact that the company has just begun the entry process to this market and hopes for an improvement in the situation. Where the company has a relatively high level of penetration, the work on retaining current and new subscribers have been continuing.

The Boston Consulting Group Matrix (hereinafter - BCG)

The analysis of company customer portfolio will help the company allocate limited resources among the various markets in which it is represented. The task is to classify each market according to attractiveness of the underlying market.

To solve this problem, Jean-Jacques Lambin [5]

recommends considering one of the most popular methods developed by the Boston Consulting Group (Boston Consulting Group, hereinafter - BCG) - the "growth share matrix".

Using the BCG matrix, you can clearly see what position the company occupies in the context of each business center in the city. Analysis by the Boston Consulting Group method is based on two major dimensions: regarding the experience curve effects and the product / service life cycle. Descriptions are given below:

✓ The experience curve effects is based on a substantial market share, in which there is a competitive advantage over costs. Or on the contrary, increased costs are noticeable with a small market share.

✓ Presence in a growing market is based on a high need for financing, and vice versa, services / goods in a market with a low growth rate do not need large financing.

When implementing both hypotheses, 4 groups of good/service markets can be distinguished, corresponding to different strategic goals and financial needs.

✓ «Cash cows».

Description: Low growth/high share. In this case, the goods / services may give more money than it is required to maintain their market share. Generally, cash cows are a source of finance for diversification or research. The strategic goal is "skimming the cream".

✓ «Dogs».

Description: Low growth/low share.

The company has little hope of increasing market share and is making a loss or a very low profit.

✓ «Question marks».

Description: High growth/low share.

Products / services of this group require large investment to support the growth process, but still have chances for success, as the market is still expanding.

✓ «Stars».

Description: High growth/high share.

Products / services are leaders in the fast-growing market. It also requires large funds to maintain growth, but because of their competitiveness give significant profits. Potential is a change of the previous "cash cows".

Since any business can be placed in a similar matrix, the authors carried out an appropriate analysis to determine the possibility of markets in the context of business centers, where the scale can be indicated by a circle with a surface area proportional to the number of connected clients. Further, analysis is planned to be conducted in a dynamic mode, tracing the development of each market over time.

The area of the diagram is visually divided into four parts, each of which includes certain strategic features. The diagram consists of two axes: the market growth rate is vertical and the indicator of relative market share as the horizontal axis.

First of all, it is necessary to collect information from sales managers of the Aktobe branch of JSC «KazTransCom». According to the information received, it was identified that the share of the main

business counterpart belongs to JSC «Kazakhtelecom».

Table 3. Report on connected clients for 2016-2017.

Name	Quantity of clients of KazTransCom JSC		Market share of KazTransCom JSC, %		Major competitor share, %	Market growth index (Im)	Market growth rate % (2017/2016)	Relative market share (Sr)
	Nov. 2016	May. 2017	Nov. 2016	May. 2017				
1 BC "PROGRESS"	5	6	13,5%	15,8%	84,2%	1,20	20%	0,19
2 BC "Dastan"	2	2	10,0%	10,0%	90,0%	1,00	0%	0,11
3 BC "Renaissance"	0	0	0,0%	0,0%	100,0%	0,00	-100%	0,00
4 BC "Geobasis"	13	16	72,2%	84,2%	15,8%	1,23	23%	5,33
5 BC "Capital Plaza"	26	32	47,3%	58,2%	41,8%	1,23	23%	1,39
6 BC "Grand"	0	0	0,0%	0,0%	100,0%	0,00	-100%	0,00
7 BC "MATRIX"	0	0	0,0%	0,0%	100,0%	0,00	-100%	0,00
8 BC "Dom byta"	0	0	0,0%	0,0%	100,0%	0,00	-100%	0,00
9 BC "Kazyna"	9	9	81,8%	81,8%	18,2%	1,00	0%	4,50
10 BC "Transenergo"	3	3	75,0%	75,0%	25,0%	1,00	0%	3,00
11 BC "Mir"	0	0	0,0%	0,0%	100,0%	0,00	-100%	0,00
12 BC "Asan"	0	0	0,0%	0,0%	100,0%	0,00	-100%	0,00
13 BC "Alatau"	10	17	11,1%	19,1%	80,9%	1,70	70%	0,24
14 BC "POSH"	11	14	14,5%	18,4%	81,6%	1,27	27%	0,23
15 BC "Sun Sity"	3	3	9,1%	9,1%	90,9%	1,00	0%	0,10
16 BC "Oficce Land"	0	0	0,0%	0,0%	100,0%	0,00	-100%	0,00
17 BC "Batys"	1	1	7,7%	7,7%	92,3%	1,00	0%	0,08
18 BC "Tenke Capital"	0	0	0,0%	0,0%	100,0%	0,00	-100%	0,00
19 TK "CITY" и BC "Dastan Optimum"	1	1	2,2%	2,2%	97,8%	1,00	0%	0,02
20 LLP "Samson"	1	0	9,1%	0,0%	100,0%	0,00	-100%	0,00
21 BC "Astoriya"	2	7	11,8%	41,2%	58,8%	3,50	250%	0,70

Note: Source: materials adopted from JSC «KazTransCom» (2017)

The calculation of the growth rate index (Im) is taken as the ratio of the relative market share (St [k]) to a specific business center in the current period (St-1 [k]). In the research section – number of clients in May 2017/ number of clients in November 2016.

$$Im[k] = S_1[k]/S_{t-1}[k] \quad (1)$$

where k – business center;
t – current period

The relative market share (Sr) is considered as the ratio of the company's market share (Sf [k]) to the share of the main competitor (Sc [k]).

$$Sr[k] = Sf[k]/Sc[k] \quad (2)$$

In the research section – number of clients in May 2017_Г/ Share of the main business competitor.
Thus, based on the indicators of the connected customers/clients Report for 2016-2017, the authors

built a BCG matrix in the context of business centers, where the company has the technical capability to provide services.

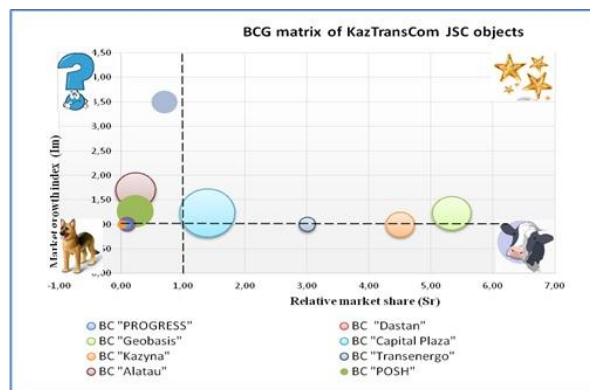


Figure 4. BCG matrix in the context of business centers (Note: Source: materials adopted from JSC «KazTransCom» (2017))

Based on the analysis of the BCG matrix (Figure 4) in the context of business centers, where the company has the technical capability to provide telecommunications services, the following business centers have the market growth rate (over 10%):

BC "PROGRESS", BC "Geobasis", BC "Capital Plaza", BC "Alatau", BC "POSH", BC "Astoriya". All the other business centers are located in the area of low market growth, or there is even no growth at all. At the same time, BC "Geobasis" and BC "Capital Plaza" took place in the "stars" section. The above data show that expectations about economic efficiency have been confirmed. At present days these business centers have active sales, and there is also a great potential for their further development.

BC «Kazyna» and «Transenergo» are located between the «stars» and «cash cow» sections, which indicates that the situation is not stable. If the current marketing tools will be weakened or if the sales managers work weakly, the market growth rate may slow down or stop, and also transition to a segment "cash cows" could be possible too. In this case, there may be expenses for holding positions lower than making profit.

In the "question marks" section, the followings were designated: BC «PROGRESS», BC «Alatau», BC «POSH», BC «Astoria». It indicates the beginning of market growth, a high sales rate, but resources for support and development are also required. The low rate of profit in the short term can also be considered as the main feature.

It is necessary to pay attention to the location of such business centers in the BCG matrix as: BC "Dastan", BC "Sun Sity", BC "Batys", TC "CITY" and BC "Dastan Optimum", which can be found under a risk of low profits or unprofitability, limited opportunities for sales growth, market decline, as they are on the border between the "question marks" and "dogs" sections.

The BCG matrix did not reflect nine business centers,

where there are no subscribers of JSC «KazTransCom» yet due to the fact that the process of setting fiber-optic cable to these buildings has not been finished by the time of this study, as such there was no technical possibility of providing services to those companies. The authors qualify these objects as "temporarily undefined", since today they are entering new markets and there are no results from the work.

4. Results

The main advantage of the Aktobe branch of JSC "KazTransCom" is the service provided to their users. JSC "KazTransCom", along with telecommunications services, also provides services for the maintenance of cables, equipment and various internal infrastructure. For these purposes, employees of the company have been working on a rotational basis for many years, this allows the staff to eliminate accidents for several hours and at any time of the day.

Having telecommunication networks in oil and gas fields in such regions like: Kandagash, Kenkiyak village of Temir district, Zhanazhol town of Mugalzhar district, Mugalzhar village, Shalkar, Aralsk, Kazalinsk, Baikonur towns, JSC "KazTransCom" has its own fiber-optic communication lines along the oil and gas pipeline of major companies in the region as:

- JSC «CNPC-Aktobemunaigas»;
- JSC «Intergas Central Asia»;
- WB JSC «KazTransOil»;
- JSC «KazTransOil»;
- LLP «Kazakhoil Aktobe»;
- JSC «Northwest pipeline company Munai Tas»;
- JSC «TNC Kazchrom» etc.

In this regard, the tariff policy of the Aktobe branch of JSC "KazTransCom" on connecting new customer sites is much more flexible than those of counterparts. JSC "KazTransCom" closely works out each technical specification with both customers and potential customers at the project development stage, SCM by doing so, lays down their equipment and necessary type of connection in advance – all of these give a great advantage over a counterpart in the procurement formation process.

Quality services/works provided to customers result in great achievements for JSC "KazTransCom". In this context, a short-term agreement turns into long-term mutually beneficial relations and opens up opportunities for new joint projects. Figure 5 shows the biggest implemented projects of the company.

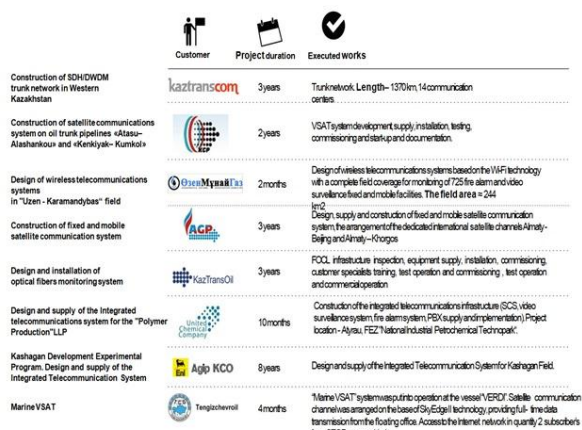


Figure 5. The biggest implemented projects of the company (Note: Source: materials adopted from JSC «KazTransCom» (2017))

5. Discussion

The development of any society always depends on its territory. Regional economics is a field of scientific knowledge that studies the development and placement of productive forces, social and economic processes in the country and its regions.

It should be noted that an important function of supply chain innovations in the field of telecommunications is to synchronize services with the client. Another important function is to optimize the management process: the management system significantly reduces dependence on employees. Thus, the entire supply chain will function with higher efficiency and with a lower risk of errors.

The regional socio-economic system studied by the regional economy is an integral set of interrelated and interacting social and economic institutions (subjects) as well as relations regarding the distribution and consumption of material and intangible resources, production, distribution, exchange and consumption of goods and services (2009).

Regional SCM as a type of special management is a set of principles, methods, forms and means of influence on the regional economic activity. For more effective management of the national economy, in 2014, the Republic of Kazakhstan adopted the Regional Development Program until 2020, which aims to create favourable conditions for the

development of the socio-economic potential of the regions through the formation of a rational territorial organization in the country, stimulating the concentration of population and capital in economic growth centers. The use of information and communication technologies in supply chain management at the regional level allows companies to compete in the product supply speed. Through the information flow management, capital flow, and information transfer logistics, an intelligent supply network helps enterprises identify material procurement lines, reduce inventory, warehouse costs, and optimize product transportation.

According to the Regional Development Program until 2020, the Aktobe city agglomeration is classified as a promising “first-tier” city with a population of 622.7 thousand in 2019.

Aktobe region - II in Kazakhstan region by the territory where

- all stocks of domestic chromium
- 55% of nickel;
- 40% of titanium;
- 34% of phosphate are mined.

Aktobe region has a convenient geographical location. Therefore, regional services in the field of transport and logistics are at a high level. This factor also enhances the competitive advantages of the manufacturing industry in terms of product promotion abroad, and the chemical, food and metalworking industries are developing on the basis of local raw materials.

Aktobe region is the second largest region of Kazakhstan. According to the administrative-territorial unit, the region is divided into 12 districts and 142 rural districts. There are eight towns located on the territory: seven small towns (Alga, Zhem, Kandygash, Temir, Khromtau, Shalkar, Emba) and Aktobe, as well as 372 villages.

Population of Aktobe on July 1, 2016 amounted to 839,151 people, compared with last year increased by 10,851 people or 1.3%. The proportion of the population of Aktobe region in the structure of the Republic of Kazakhstan is 5% (Table 4).

Table 4. Population of Aktobe city

Indicators	half year 2013		half year 2014		half year 2015		half year 2016		In comparison with the Republic of Kazakhstan
	Aktobe region	The Republic of Kazakhstan	Aktobe region	The Republic of Kazakhstan	Aktobe region	The Republic of Kazakhstan	Aktobe region	The Republic of Kazakhstan	
Population	801300	17 028 600	815 797	17 285 000	828 300	17 541 200	839 151	17 753 200	5% - specific gravity
Unemployment rate,%	5,2	5,2	4,9	5,1	4,7	5	4,9	5	-0,1
Average monthly wage, tenge	973 30	109 962	108 318	124 780	108 007	124 227	107 596	133 504	-25908

Note: Source: Committee on Statistics (2017)

Taking into account the competitiveness of the Aktobe agglomeration, it is planned to take the following actions aimed at making the city an industrial-innovative center:

- ✓ to organize the production of further processing in metallurgical and chemical industries as well as developing the production of constructional materials and structures
- ✓ technological re-equipment of existing production
- ✓ to reorganize technopark activities in the zone of high technology in Aktobe region (with the relevant production facilities, laboratory equipment)
- ✓ to develop research and innovation infrastructure with skilled workers to provide current and new products
- ✓ to establish an industrial zone

The enterprise JSC «KazTransCom» is operating quite successfully in the region of Aktobe.

JSC «KazTransCom» is a leading telecom operator providing a wide range of services in the field of telecommunications and information technologies. The company offers not only a fixed set of products, but also the creation of modern info-communicative solutions CSM by individualizing the customer. The company has a full range of services: system integration, to carry out any turnkey projects, various kinds of communication and maintenance of telecommunications equipment.

Aktobe Branch was established on the basis of Aktyubinsk Operational and Technical Telecommunications Office (later since 1986, the West Kazakhstan Communications Department and JSC «Aktyubneftsvyaz»), which provided services to the largest oil producing company in the region. Then, after the collapse of the USSR and through transformations, in 2001, OJSC «Aktyubneftesvyaz» was merged with OJSC «KazTransSvyaz», as a result of which became the Aktyubinsk Branch of JSC «KazTransCom».

The main activities of the company.

Telecommunications:

- Internet access services;
- telephone services;
- IP-VPN Virtual Private Networks;
- transparent highlighted channels;
- delivery, installation and configuration of telecommunications equipment;
- satellite services;
- trunking services;
- multimedia intellectual services;
- equipment placement in data centers.

Cloud services:

- virtual automatic telephone station;
- network virtualization;
- installation of cloud servers;
- cloud video surveillance systems;
- cloud software.

6. Conclusion

The following conclusions can be drawn based on the results of the study.

The main advantage of the Aktobe branch of JSC «KazTransCom» in comparison with Aktobetransstelecom is highly qualified staff in the field of communications and SCM. Aktobetransstelecom does not have enough telecommunication networks in the oil and gas fields in such regions as Temir district, Kenkiyak village, Mugalzhaz district, Zhanazhol village, where the main oil and gas reserves are concentrated. JSC «KazTransCom» achieves great results through high quality services/works provided to their customers. In this research, the sustainable supplier selection problem of the telecom industry in the southern part of Iran was investigated, showing the effectiveness and applicability of this proposed integrated approach. The regional management of an information supply chain, as a type of special management, was defined to be a set of principles, methods, forms and means of influence on the economic activity of a region. Through the information flow management, capital flow, and information transfer logistics, an intelligent supply network helps enterprises identify material procurement lines, reduce inventory, warehouse costs, and optimize product transportation.

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