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# DIGITAL LIFE OF RUSSIAN MEGAPOLISES

## MODEL. DYNAMICS. CASES

SKOLKOVO Institute for Emerging Market Studies (IEMS)
2016

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# Content

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Digitalisation is not only a source of opportunities for federal and local businesses, it is a factor in the global competition for human capital, the main development resource of the 21st century.

Dear colleagues,

We would like to present the report *Digital Life of Russian Millionaire Cities. Model. Dynamics. Examples*. This study is dedicated to the issues of penetration of the modern digital technologies into all aspects of daily life in major Russian cities. The report was prepared by the experts of the SKOLKOVO Institute for Emerging Market Studies with the participation of professors of IESE Business School (Barcelona, Spain).

The publication focuses on the transition from the primary – quantitative – stage of digitalisation to the secondary – qualitative – stage, from the creation of infrastructure to its use. The findings show that the major Russian cities have already made considerable progress in this respect, and the interesting cases of regional digital projects prove it.

In this study, secondary digitalisation is seen not only as a source of opportunities for federal and local businesses, but also as a way to improve the quality of life in a region, a significant factor in the competition for human capital, the main development resource of the 21st century. It is exceedingly important for regional administrations to realise the role of digital technology, since they are responsible, one way or another, for the creation of appropriate approaches and policies. More and more often, researchers all over the world refer to the concept of a "city as a platform", that is, an open system that ensures socioeconomic development through the integration of multiple independent players based on a unified infrastructure of systems and data.

We believe that the report we are presenting will draw renewed attention to the possibilities of the digital economy in the Russian regions, help businessmen and municipal administrations in the planning of their activities, and, ultimately, make Russian cities strong players in the global competition for human capital.

ANDREI SHARONOV,

President of the Moscow School
of Management SKOLKOVO

As information technologies evolve, the world is going digital, and this transformation is changing everything: our way of thinking, living, working and of course doing business. We simply cannot ignore this trend when making business decisions in any area, whether it be markets, sourcing, production, staffing or financing. To manage business effectively today, we have to take into account all available qualitative insights and quantitative measures associated with the digital transformation.

For this reason, we are very interested in the efforts of SKOLKOVO IEMS to understand and analyze the phenomenon of digitalization. The digital transformation is ubiquitous, affecting corporations, individuals and also living environments – cities first of all. Digitalization creates numerous business opportunities for both national market leaders and international corporations, as is evident from this report. Many of our clients in the CIS have already embarked on the journey of digital transformation, and we expect that the data and insights in this report will provide better mapping of the opportunities and challenges that lie ahead and help in formulating the right strategies for business development.

Alexander IVLEV

Country Managing Partner for Russia
EY

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See EY reports “Digitization of everything” and “Disrupt or be Disrupted” for global insights on the effective digital business strategies

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# Executive Summary

Cities are at the foundation of the socioeconomic order in almost all developed countries of the world. Moreover, in the 21st century global competition is moving from the level of countries to that of cities. More and more often people and corporations make strategic choices between, say, Houston, Shanghai, and São Paulo rather than between the USA, China and Brazil. At the same time, global digital transformation is changing the daily lives of people, their environment, and the companies in which they work. As a result, the concept of a Smart City, an environment based on effective interaction between people and computer systems, which finds and retains technological solutions that ensure harmony, comfort, and development for its residents – is becoming increasingly prominent in the global agenda.

While the initial phase of digital transformation – primary digitalization – was associated with the creation of omnipresent infrastructure for Internet access with sufficient bandwidth, today the key issue in big cities in emerging markets is the quality of the use of this infrastructure. The emergence of a growing number of individual solutions results in the creation of holistic multidimensional systems, in which we can observe the so-called network effect, i.e. the growth in value for users, which is faster than the growth in the number of participants in the system. These processes, which create a new quality of life in urban areas, can be called secondary digitalization.

The **Digital Life Index of the Russian Regions** provides a quantitative measurement of the progress of secondary digitalization in the Russian cities, covering the key aspects of modern urban life, such as transportation, finance, retail, healthcare, education, media, and administration. A separate measurement of the development of supply, and helps to reveal the gaps between them, mapping out areas of possible action for businesses and administrations. The study focused on 15 Russian cities with populations of over 1 million people; the measurements were carried out in two waves: in the end of the years 2014 and 2015.

The current situation in Russia is characterised by a significant difference in the economic opportunities of the capital (Moscow) and most of the other regions, whose average per capita GRP is four times less than in Moscow. Certain disparities can be observed in the penetration of digital technologies: in Moscow more than 90% of the population regularly use the Internet, while in Perm and Volgograd – just over 70%. At the same time, Russian millionaire cities completed the primary digitalization stage in 2015, reaching a penetration rate of digital infrastructure that allows expecting for manifestations of significant positive network effects and the creation of holistic multidimensional ecosystems in the digital economy. The study shows that the economic resources of the regions largely determine the development of digital supply, but have very little effect on the digital demand. The latter, however, depends to a large degree on the perceived quality of life of the region.

Secondary digitalization of major Russian cities is developing very rapidly. The three leading cities stayed the same for two years – Ekaterinburg, St. Petersburg and Moscow; Kazan and Novosibirsk rank fourth and fifth, respectively, having left Perm, Krasnoyarsk, and Samara behind. Volgograd and Voronezh remained at the bottom of the rating, but they have changed places between the 2014 and 2015 waves. Rostov-on-Don is currently the most dynamically developing city. The growth of digitalization is mainly due to the growing demand, whose average index for the year has increased by almost twofold, while the supply at the end of 2015 was even slightly lower than a year earlier.

The dimensions of urban life with the most dynamic processes of secondary digitalization are healthcare, education, and administration. At the same time, there was a significant reduction in regional digital supply in the area of finance due to the economic stagnation and the policy of the national regulator, aimed at the consolidation of banks, as a result of which a number of smaller banks with developed digital services left the market.

It is important that the diverging dynamics of supply and demand resulted in the reduction of the correlation between them; this was observed in 10 of the 15 cities, and in seven of the cases the change was dramatic. A significant increase in the correlation happened only in two cities – Moscow and St. Petersburg. As to the dimensions of digital life, correlation substantially declined in finance, administration, and education; the only element in which the correlation increased is the media.

The growing gap in the demand and supply correlation is a reflection of the relative weakness of the local digital entrepreneurial initiative and the insensitivity of the federal network players (banks, retailers, etc.), as well as local administrations to the peculiarities of the local demand. Despite the fact that there are interesting cases of digital businesses in the regions, in general, the number of regional companies that actively use the benefits of digital transformation is relatively small, considering the size of the country. So far, supply in the digital economy is characterised by approximately the same degree of centralisation in the capital regions as in the traditional industries and demonstrates a strong dependence on the region's economic performance: the higher the per capita GRP in the region, the higher the digital supply.

As the development of digitalization in Russia is characterized by uneven growth of supply and demand for certain aspects of urban life, local and federal businesses have two possible strategic approaches:

- to ride the wave, that is, to create projects in the areas that have developed the strongest in the region in terms of digitalization. In this case, businesses are likely to find themselves in tough competitive situation; however, they can benefit from the established markets; and
- to conquer a niche, that is, to work on supply in the undeveloped areas in the region, where competition is low, but demand must be created and expanded.

The choice of a specific strategy is a combination of resource capabilities, corporate culture, and the overall business vision of each individual company. At the same time, administrations should seek to equalise the digital profile of the cities and ensure a balance of supply and demand.

The study confirmed a considerable interrelation between the development of digital demand and the integral quality of life in the region. The intensity of regional digital life is becoming an important tool in the competition between regions for human capital – the most valuable resource in the 21st century economy. The digital competitiveness of the Russian regions on a global scale can be considered one of the most important strategic objectives of socioeconomic development in the next decade. According to the Index presented in this report, the key to the solution of this problem is supply: the country needs a lively, competitive, localised culture of digital enterprises that meets consumer demand through multidimensional ecosystems with multiple network effects.

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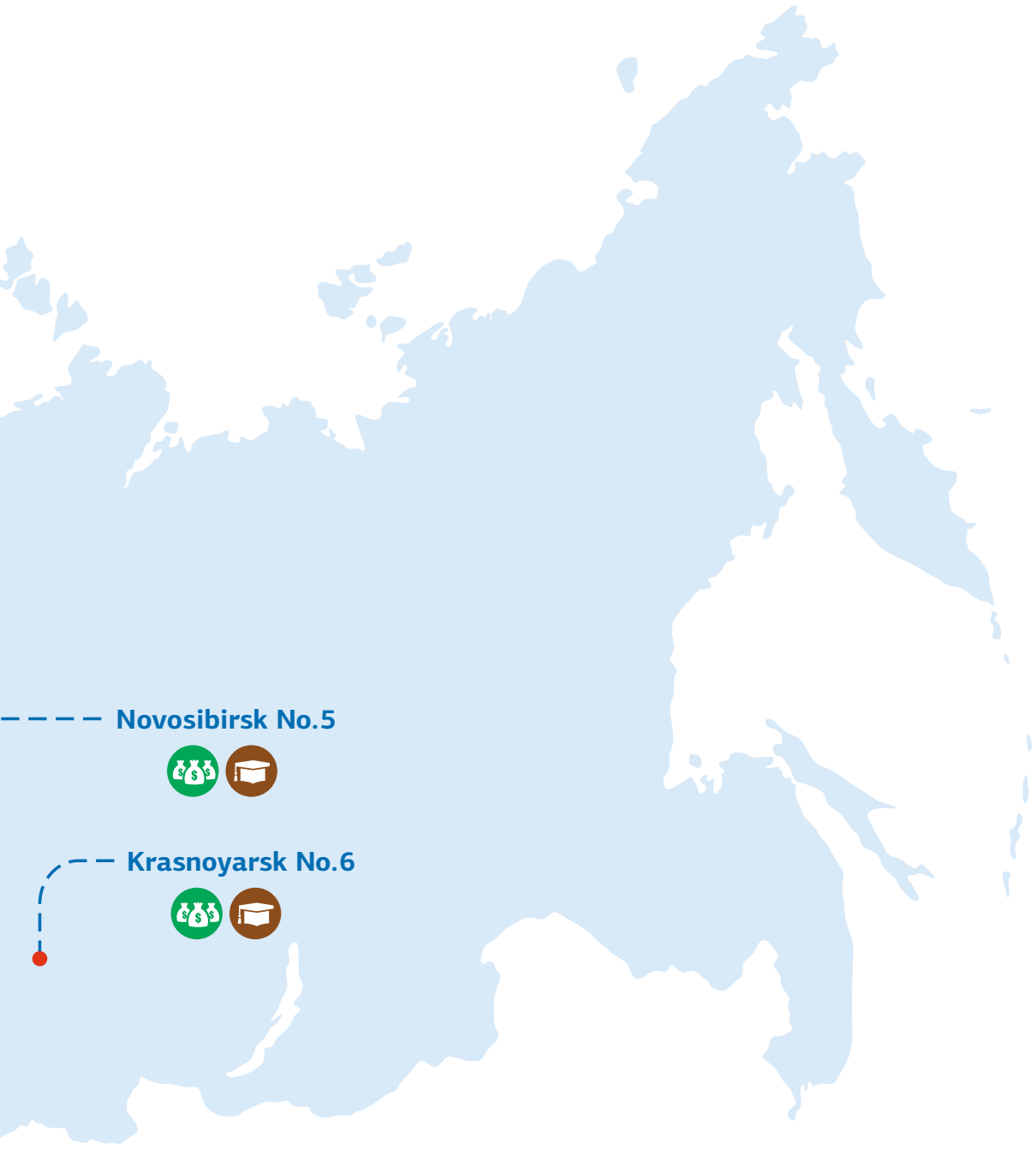
St. Petersburg No.2
Nizhny Novgorod No.8
Kazan No.4
Moscow No.3
Ufa No.9
Voronezh No.15
Perm No.7
Rostov-on-Don No.10
Volgograd No.14
Samara No.12
Chelyabinsk No.11
Omsk No.13
Ekaterinburg No.1

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# I. From access infrastructure to full digital life

## Digital transformation and the city. The research objectives

Cities are the foundation of socioeconomic order in almost all developed countries of the world today, and this role continues to grow. According to UN estimates, in 2015 the world crossed the threshold of 50% urbanisation, and urban population is expected to grow to 60% by 2030 and to 70% by 2050. The concentration of economic life in cities is even higher: the 750 largest cities of the world produce as much as 57% of world GDP[1].

Some researchers[2] believe that, in the 21st century, global competition is gradually moving from countries to cities. More and more often people and corporations make strategic choices between Houston, Shanghai, and São Paulo rather than between the USA, China, and Brazil. We can say that the era of ancient policies, independent hubs in the global network of business, political and cultural relations, competing with each other for residents, commerce, and fame, is coming back to some extent.

What is the role of the so-called digital transformation – the saturation of all spheres of life with computer systems connected to each other, exchanging signals and creating ever-increasing amounts of data – in the process of the new uplifting of cities? The use of digital systems changes the daily lives of people, their environment, and the companies they work in. These systems are known for their ability to create a positive network effect, in which each new application increases the quality of the existing ones.

An example of this kind of effect within a city: the development of modern non-cash payments, such as NFC-based payment in the form of a touch-pay card or a smartphone. Such technology allows among other things one-touch payment for public transport, which speeds up the passenger flows and increases effectiveness. The same technology quickens the payments small retail, including fast food, which helps to process more service orders. On the other hand, the convenience of technology encourages consumers to buy special cards or install applications in their smartphones, and keep cash balances on their current accounts[3]. These funds can be used in a variety of business models applied by new companies in the financial technology sector. Such chains of effects can be virtually endless.

The concept of the Smart City is taking centre stage in publications and discussions on urban studies. There are many views regarding its essence and the tools that must be used to implement it. The technocratic school pictures urban systems – from electricity to traffic lights – penetrated by myriads of sensors and fully controlled by artificial intelligence. An alternative view argues that smart means, first of all, a high quality of the human capital and a proactive involvement of residents in urban life. In reality, digital technology increasingly allows creating environments based on effective interaction between people and computer systems; thus, a perfect city of the future will probably find and retain technological solutions that ensure harmony, comfort, and development of its inhabitants.

The research project, developed by the SKOLKOVO Institute for Emerging Market Studies and presented in this report, is an attempt to introduce a quantitative measurement of the quality of the use of digital technologies in the life of modern cities[4]. The focus

1 http://www.oxfordeconomics.com/cities/report

2 Cf. https://www.pwc.com/gx/en/government-public-sector-research/pdf/cities-final.pdf, Nations are no longer driving globalization—cities are (http://qz.com/80657/the-return-of-the-city-state/), Cities of tomorrow (http://ec.europa.eu/regional_policy/sources/docgener/studies/pdf/cities-oftomorrow/citiesoftomorrow_final.pdf)

3 In the USA the average sum of deposits in the mobile payment of app of Starbucks is over USD 1 bn, comparable to the deposit base of smaller US banks

4 Some global research projects which are close in research questions, though radically different in methodology are Cities In Motion index by IESE Business School (Spain) and the Innovation Cities ranking by 2ThinkNowcompany from Australia. The research on Data-Driven Cities published in Summer 2016 by PwC uses very similar model of dimensions of the city life, yet differs completely in the way of measurement of digitalization, inter alia not counting the development of demand

of our study was the 15 largest cities in Russia with populations over 1 million people. As a rule, it is in large cities that a critical mass of technologies and involved users accumulates more quickly, which triggers the network effects described above. Another reason why Russian regions are an interesting object of study is the considerable inequality in the distribution of economic resources. Its impact on the penetration of digital technologies – both in terms of supply and demand – was an important issue.

Do resource capabilities determine the degree of digitalization or, on the contrary, are modern digital systems used in order to overcome current economic constraints and to take a leap in the development (which is described as leapfrogging in the international literature and can be observed in many emerging markets, from India to Kenya)? What gaps between the supply and consumer demand of digital technology exist in Russia (which determine opportunities for the players of digital markets, businesses, and administrations – as analysed by city or by industry? The Digital Life Index of the Russian Regions, performed in two measurement waves in the end of the years 2014 and 2015, was intended to find approaches to answering these questions. Comparing the results obtained at an interval of a year not only allows us to get a static picture of relative digitalization, but also to reveal the dynamics of its development.

## From primary to secondary digitalization

From the point of view of technology, digital transformation is often described in the terms of the nexus of forces: mobility, social, big data (analytics), and cloud computing technologies[5]. The need to access the Internet with sufficient bandwidth is the factor that unifies these forces. For a long time, the provision of such an opportunity for all interested users – the development of infrastructure for various (wired, fixed wireless, and mobile) communication channels, was a key development area of the digitalization of cities and territories. This stage can be called the primary, mainly quantitative, digitalization, its progress is traditionally measured as the percentage of population with reliable access to the Internet[6].

However, the measurement of the Internet penetration alone does not give significant results for an analysis of the developed digital markets, since quantitative parameters are no longer correlated with the quality of the systems: their goals, instruments, diversity, and power participants. Yet it is from the development of systems rather the development of infrastructure that the effects of digitalization and benefits for the city can be expected from. Thus, the processes of secondary digitalization, which convert the installed capacity for Internet access into applications that can be used directly by people, businesses, administration, and public organisations in order to achieve a new quality of economic and social life become of primary importance.

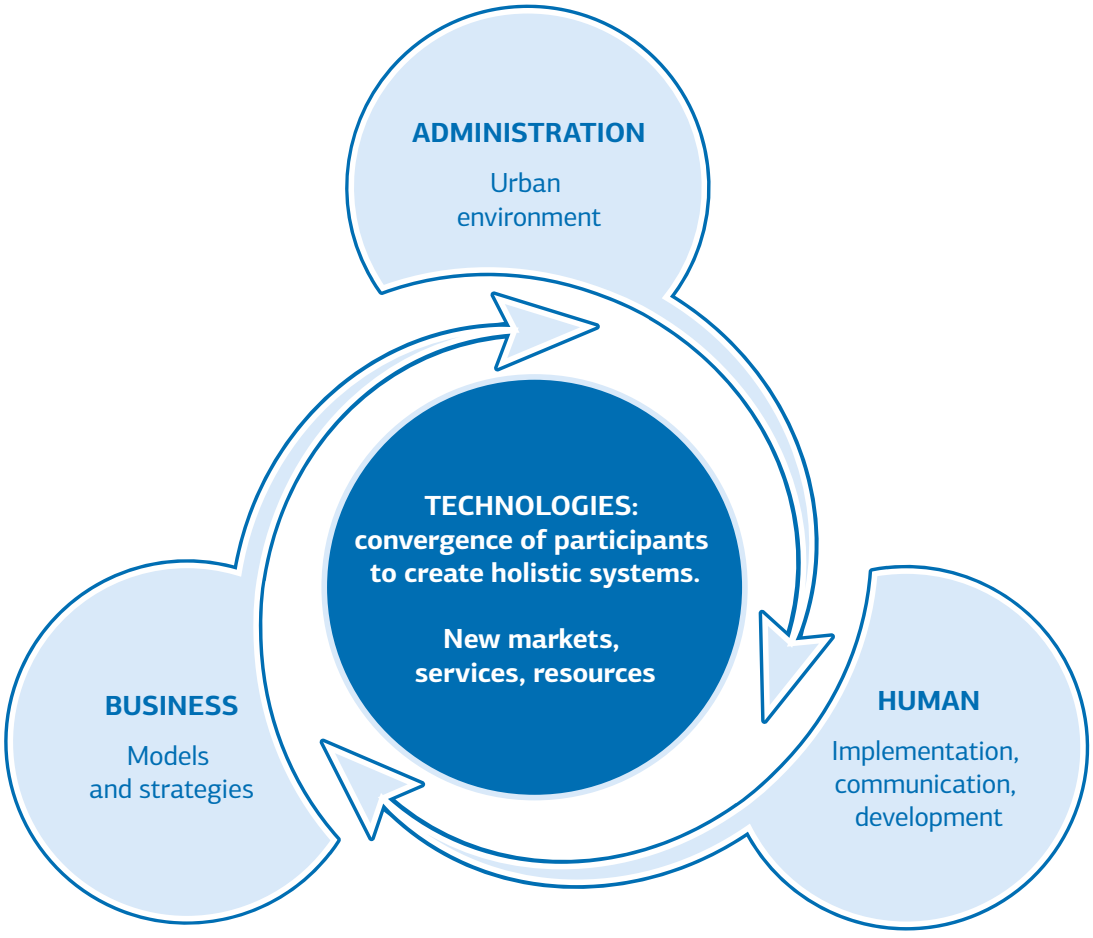
In theory, digital technology can substantially reduce various types of transaction costs (including those of logistics and communications), bringing together and uniting participants, creating new opportunities for them in holistic dynamic systems that operate 24/7/365 in real time. A popular example is the business model of Uber (no wonder the term "uberisation of business"[7] was coined), in which an Internet platform allows independent private drivers to offer their services to best match the needs of each particular customer (from the place and time of arrival to the style of communication between the driver and the passenger). When it

5 The model was introduced by the Gartner company in early 2010s and further developed in the research literature: http://www.gartner.com/technology/research/nexus-of-forces/
6 E. g. ICT Development Index: https://en.wikipedia.org/wiki/ICT_Development_Index
7 Cf.: http://insights.wired.com/profiles/blogs/the-uberization-of-marketplaces-five-to-watch-for-2014#axzz4JYx9PJ8R

is sufficiently widespread in a particular city, the system can significantly change its environment by reducing traffic flows (reduced use of private cars), increasing the income of the population (extra revenue), and creating new communication schemes.

The development of such systems is part of the secondary – qualitative rather than quantitative – digitalization. It is clear that in contrast to the infrastructure accumulation stage, which is bound to end naturally sooner or later (when 100% of the population have access to the Internet from anywhere at any time with enough power), the process of digital system quality development is unlimited, because it affects not only the

**Participants of secondary digitalization of a city and areas of benefit from it.**



increase in the share of digital transactions in the current markets (e.g. the percentage of online payments in relation to all consumer payments)[8], but also creates new markets. In the long run, digital technology will become such an indispensable part of everyday life that it will no longer be perceived as technology, as pointed out by Don Tapscott in his famous book Grown Up Digital[9]. We have long stopped regarding refrigerators, washing machines, or television sets as technology, although once these devices radically changed household and leisure patterns.

## Model of secondary digitalization of a city: supply and demand balance

How can we describe the future digital life of a city if we do not yet know some of its markets and models? The most appropriate way is to put a human being and his/her needs in the centre of it. We have identified seven areas collectively covering most of these needs: transportation, finance, retail, education, healthcare, media, and administration. One can say that this model lacks one more component – work, a key contemporary everyday practice. This is certainly an important gap, but the variety of strategies in this area, including entrepreneurship and self-employment, and an exceedingly multidimensional picture of the employers makes it close to impossible to study the area with precise quantitative methods. It is easy to see that the presented model involves the domains of activity of both mainly private players (retail, media) and government bodies (administration, and, in Russian practice, most of healthcare and educational institutions), and areas where entrepreneurship develops in the framework of rather strict state regulation (finance, transportation), which, at times, can inhibit the penetration of new technology.

To understand the rate of digital technology penetration into each of these areas, it is necessary to distinguish between demand and supply development. This separation is very important, because the behavioural inertia of users and their lack of necessary knowledge and skills form a significant barrier to the penetration of any innovation system. At the same time, the rate of mastering modern technology by consumers can also grow fast, with the creators of new business models and applications not keeping up with potential demand.

As noted above, the key factor for the development of a digital city is the harmony of citizens and the digital systems, which uses their capacity for the purposes of socioeconomic development, in particular to overcome the traditional lack of resources, both financial and human. Present-day education and healthcare systems allow people to access the best practices from any part of the world; global e-commerce market players redefine shopping opportunities for individuals and supply chain strategies for companies; modern financial systems ensure an increasing availability (inclusion) of saving, payment, and loan instruments. The international research publications increasingly focus on the phenomenon of leapfrogging[10], in which a digital system helps to completely overcome the lack of traditional infrastructure.

In an ideal city, digital supply and demand are balanced, market participants promptly respond to the development of consumers, and the latter, in turn, quickly acquire the skills and habits of using new technological developments.

The time of this idyllic digital harmony of supply and demand has yet to come. On the other hand, it is the gaps between demand and supply that can prompt new opportunities to market participants—businessmen

8 The so called "digital density", see: http://blog.iese.edu/faceit/2013/digital-density-reshaping-business-models-and-organizations/
9 Don Tapscott: Grown Up Digital, McGraw-Hill, 2008
10 A classic example of the phenomenon is the mobile money system M-Pesa in Kenya which enabled customers to do cashless payments in the environment of underdeveloped network of bank branches and ATMs

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# Digital transformation of work

In the epilogue of his influential book **The Future of Work**[11], published in 2004, Thomas Malone wrote, "Decentralised organizations of the 21st century... will have the benefits of small scale and large scale simultaneously. They will give people a lot of flexibility and freedom, as well as integrate the people and activities around the world on a scale that has never been possible before, even in distant approximation." In the years since it was made, this statement has become more and more true. With the growth of Internet penetration in the whole world and the creation of more deployed and effective systems of mutual work, companies have received global access to talents, and, on the other hand, a highly-qualified person living in any part of the world has the opportunity to work for an organisation located thousands of kilometres away. For many people the concepts of workhours and workplace have disappeared: they themselves determine the time to devote to work, and the workplace can be anywhere – in a country cottage, a café, or even a park. The BYOD (bring your own device) concept has appeared, meaning that business processes are carried out using personal computers and smartphones that employees are used to. This concept is spreading more and more, even within offices of large corporations with strict discipline. Companies are increasingly using social networks and online messengers (applications created for leisure and free communication) as operating tools.

As a result of digital transformation, the world is on the threshold of new fundamental changes in work. According to various estimates, a significant number of existing jobs may be replaced with robots and artificial intelligence systems in the very near future[12]. How will employees, dismissed due to the rapid development of computer systems capacity, be occupied and what will they do? How will this affect society as a whole? On the one hand, we can expect a better balance of work – life, reduced stress levels, and in the field of urban planning – reduced and smoothed-out load on the transportation system during the day (especially when combined with the spread of self-driving vehicles). On the other hand, assurance of personal development opportunities and human social inclusion will become a major challenge; addressing this challenge will require the development of radically new approaches and work tools.

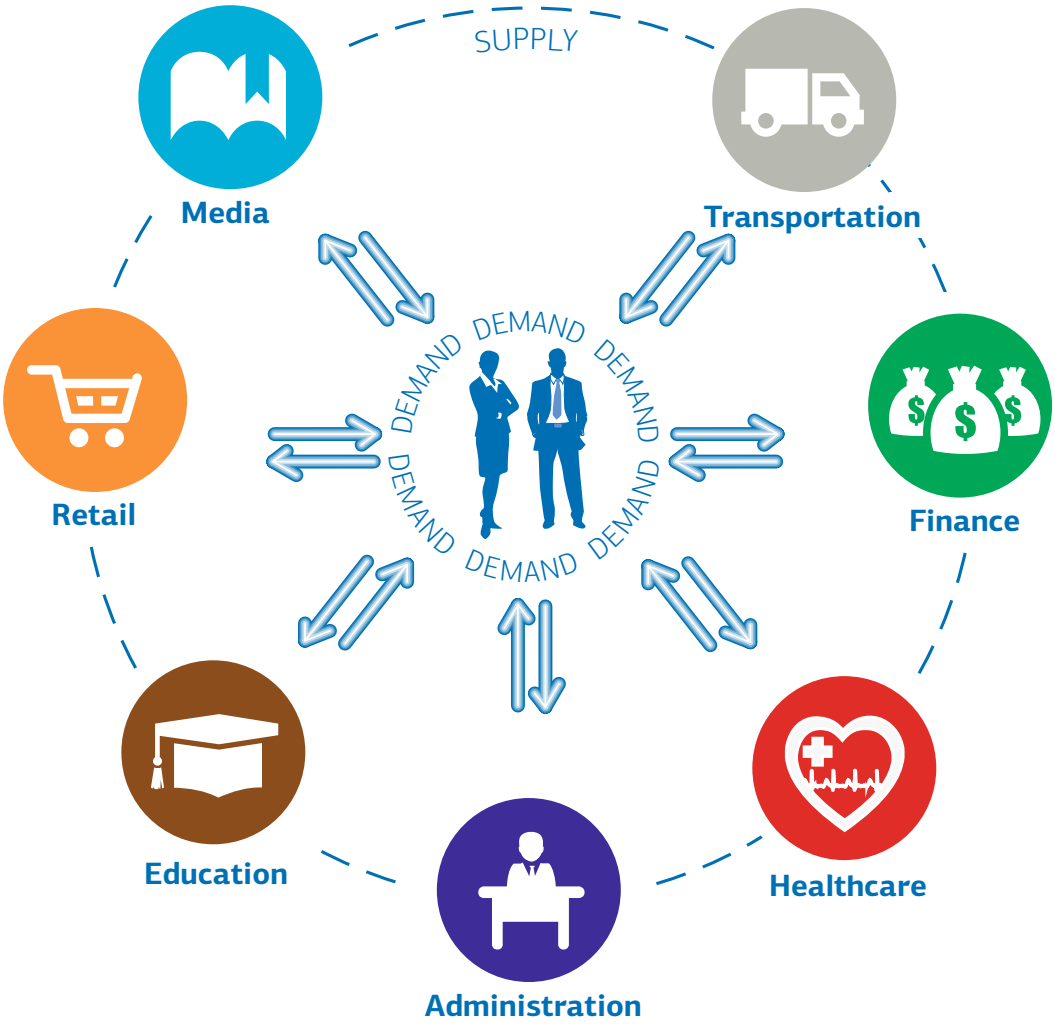
11 Thomas Malon: The Future of Work – Harvard Business School Press, 2004
12 Forrester Research estimates that not less than 6% of of industrial jobs in the USA will be replaced by robots by 2021 r. https://www.inverse.com/article/20938-ai-robots-replace-human-jobs-next-five-years. The estimates for a longer time horizon give the figures of dozens of percent

and administrators, and approaches to their use. Quantification of these opportunities is set out in the **Digital Life Index of the Russian Regions**, developed by the SKOLKOVO Institute for Emerging Market Studies.

## How to measure the digital life of a city?

To make a quantitative measurement of the degree of secondary digitalization of Russian regions, the SKOLKOVO Institute for Emerging

**Model of everyday urban life**



Market Studies developed the **Digital Life Index**[13]. To compile the Index, the researchers selected 15 Russian cities with a population of more than 1 million people as of 2014, according to the Federal State Statistics Service, namely Moscow, St. Petersburg, Kazan, Volgograd, Novosibirsk, Ekaterinburg, Nizhny Novgorod, Samara, Chelyabinsk, Omsk, Rostov-on-Don, Ufa, Krasnoyarsk, Perm, and Voronezh.

Each of the cities was evaluated in terms of the seven areas of digital technology application, i. e. transportation, finance, retail, healthcare, education, media, and state administration. Specific indicators, showing the state of the city's digital infrastructure development, were selected for each of the areas. Both existing figures, contained in other studies, and new empirical data, collected specifically for research purposes, were used in the study.

All indicators were divided into two types: some characterised the demand for digital infrastructure objects, while others characterised the supply.

To analyse **demand**, the researchers used data indicating the degree of activity and interest of Internet users in the existing digital infrastructure. Firstly, the number of search queries in the Google and Yandex systems regarding the cities' digital services that city residents are interested in was estimated. The average number of queries per month over the year preceding the period of data collection (November 2014 and November 2015) related to the size of population of a given city. Secondly, the activity in social networks (VK, Facebook, Odnoklassniki and Moi Mir) was analysed, broken down by city.

To analyse **supply**, researchers used factors indicating the presence and the degree of digital infrastructure development in the cities under consideration. Among other measurements, the functionality of on-line hospital websites and official portals of local administrations was assessed with focus on the usability and completeness of the services provided. The number of massive online open courses (MOOC) provided by local universities was measured in the field of education. To assess the development of digital supply in the field of finance and retail, a number of bank branches (top ten of Internet Banking Rank 2014 – Markswebb Rank & Report) and pick-up points of online stores (top five of Forbes ranking in 2014 and top ten of Forbes ranking http://www.ruward.ru/ecommerce-index-2015/ in 2015) were considered for each of the cities. The assessment of supply in the media was based on the citation index of regional media (http://www.mlg.ru/ratings/regional_media/3745/0/0/2/) with the selection of top five online periodicals in each of the cities.

The results obtained were normalised taking into account the population in the city. The final score of the city for 2014 was determined by the average place in the rankings for each of the measurements (based on the following calculations: 1st place = 1 point, last place = 0 points), and the score for 2015 was determined in accordance with the scale recorded in 2014 (thus, values of more than 1 and less than 0 were possible).

To analyse the correlation between demand and supply, the calculation of correlation coefficients was used.

## Business opportunities of digital technologies in the regions of Russia: response to local demand

What opportunities are opening up for the digital business in Russia? The main conclusion of our study is as follows: the growth rate of digital demand is significantly outstripping the growth rate of supply in most of the cities. Moreover, there are systemic imbalances between the development of supply and the development of demand, which open great opportunities for business and also indicate areas for action by regional administrations.

13 The methodology of the Index was developed under the supervision of Prof. Evgeny Kaganer (IESE Business School, Spain)

In general, we can see the rise of two key trends in the field of digitalization of the largest Russian cities:

- relative weakness of the local digital entrepreneurial initiatives; and
- insensitivity of the federal network players (banks, retailers, etc.), as well as local administrations to the peculiarities of local demand.

Despite the fact that there are interesting cases of digital businesses in the regions (some of them are listed in this report), and some projects even reached the national level, the overall number of regional companies that are actively using the possibilities of the digital transformation is relatively small compared with the size of the country. So far, supply in the digital economy is characterised by approximately the same degree of centralisation in the capital regions as in the traditional industries.

For example, 80% of the assets of Russia's banking system and the headquarters of 17 of the 20 largest corporations are located in Moscow. Similarly, eight of the top ten banks with the best Internet offers are based in Moscow[14]. In the area of e-commerce, centralisation is even more pronounced: all the top ten companies evolved from Moscow[15]. For comparison, the geography of the central offices of India's 10 largest e-tailers includes three cities other than Delhi and Gurgaon, its satellite town[16]. The Chinese e-tailing is even more decentralised: the list of the top 10 companies includes only three headquartered in Beijing, while Shanghai and Hangzhou are represented by two companies each, and Nanjing, Guangzhou, and Hong Kong – by one company each.

As a result, the digital supply is determined, on the one hand, by the federal business players, whose strategies are instructed mainly by the socioeconomic situation in the region, and on the other by local administrations, which depend upon the available economic resources. In such approaches, it is evident that digital supply is inevitably related, to a large degree, to the region's economic performance: the higher the per capita GRP (gross regional product), the higher the rate of digitalization. In a sense, this contradicts the very essence of digital transformation: on a global scale, there are many examples, which prove that digital systems are able to overcome resource constraints and create new economic opportunities practically from scratch. In Russia, digital finance developed exactly like this in 2014when the medium-size market players were creative and responsive to the market needs, developing tools to compete successfully with major federal banks; unfortunately, the regulator's policy aimed at a certain market consolidation (justified from the point of view of systemic financial risks) damaged the development in this area.

An important finding obtained from the comparison of the **Digital Life Index** with the various indicators of the regions' development is a considerable link between the growth of digital demand and the integral quality of life in the region (Urbanica Index[17]), and this interconnection is getting stronger. It is difficult to say so far which of the phenomena – the quality of life or demand for digital solutions – is primary, but it is very probable that there is a complex interaction between them. However, it is evident that the vibrancy of regional digital life is becoming an important tool in the region's competition for human capital—the most valuable resource in the 21st century economy. For this reason, administrations should pay close attention to the digital development of their regions (for instance, Moscow is an example of substantial investment), but this does not mean they need to make regular injections of

14 MarksWebb report http://markswebb.ru/e-finance/internet-banking-rank-2016/
15 Rusbase research: http://www.ruward.ru/ecommerce-index-2015/
16 http://companiesinindia.net/top-10-ecommerce-companies-in-india.html
17 Integral index by Urbanica: http://urbanica.spb.ru/?p=4122

## **Case:** Satellite Town Becomes the Leader of the New Economy in India

Most of the satellite towns of the world capitals are the classical centres of the industrial economy. When real estate prices make factory premises too expensive in a city, companies begin to look for areas with good transport accessibility, cheap vast wastelands, and disadvantaged communities that can provide workers for low-paid jobs. This was the logic that guided Maruti Suzuki when it opened a large car factory in the town of Gurgaon, 35 km from Delhi. Very soon other local investors also appreciated the advantages of the area, such as the convenient proximity to Indira Gandhi International Airport, and in the late 1990s, in the wake of the liberalisation of the business climate, global corporations also opened their production facilities in the city (General Electric was the first to do so).

But now Gurgaon is known for an entirely different reason. It convincingly competes with Bangalore for the title of the IT capital of India, and some people believe that it has already won[18]. Seven of the top 10 e-commerce Indian companies have headquarters in the so-called capital region (NCR, which, in addition to Delhi and Gurgaon, includes the town of Naidu), and four of them are based in Gurgaon. Now the city has the highest Internet penetration in the country, and ranks third in terms of per capita income.

The town's success was due to a combination of several factors. The proximity to a number of the largest universities in the country (including University of Delhi) provides a steady flow of creative young people willing to become entrepreneurs. Due to the geographical position, goods and services can be delivered to the largest and richest market of the country. The abundance of cheap commercial real estate makes it easy to open not only offices, but also warehouses and other industrial buildings. As a result, the town was labelled Millennial City. It is interesting to note that, unlike some other attempts at targeted creation of innopolises, usually with the participation of the state, Gurgaon has grown due to the private initiative of industrialists and developers.

Peesh Chopra, Managing Partner, Peesh Venture Capital, "IIndia is a superpower in the field of startups, and now the country's entrepreneurs have a very wide choice of cities with favourable environments for starting a business. I think we will see towns of the second and even third level (in terms of size) turn into key hubs of startups in the coming years"[19]

18 http://timesofindia.indiatimes.com/city/gurgaon/What-makes-Gurgaon-the-countrys-start-up-capital/articleshow/48685975.cms
19 http://www.iamwire.com/2015/12/top-5-cities-indian-startup-ecosystem/127996

| Table. Correlation of supply and demand with some indicators of socioeconomic development of cities | | | | |
|---|---|---|---|---|
| | Demand in 2014 | Demand in 2015 | Supply in 2014 | Supply in 2015 |
| Integral ranking of the hundred largest cities of Russia in 2014 | 0,76 | 0,85 | 0,47 | 0,14 |
| Integral ranking of the hundred largest cities of Russia in 2015 | 0,50 | 0,56 | 0,33 | 0,22 |
| Industrial production | 0,17 | 0,11 | 0,60 | 0,81 |
| Industrial production per capita | 0,03 | -0,10 | 0,38 | 0,58 |
| Well-being rating of Russian cities | 0,40 | 0,45 | 0,57 | 0,64 |
| 30 best cities for business in 2013 | -0,41 | -0,30 | -0,42 | -0,15 |
| Population | 0,16 | 0,15 | 0,57 | 0,76 |
| Higher educational institutions per thousand population | -0,17 | -0,17 | -0,13 | -0,14 |
| Per capita GRP | 0,30 | 0,32 | 0,62 | 0,74 |
| Internet penetration (daily use) | 0,60 | 0,56 | 0,79 | 0,76 |
| Number of domains per capita | 0,29 | 0,25 | 0,72 | 0,61 |

The cells with a strong positive relation are marked green, and the cells with a negative relation are marked red.
The green font shows a significant growth rate in 2015 compared to 2014, and the red font shows a significant decrease in the indicator

## **Case.** Hangzhou: China's Capital of E-Commerce

By Chinese standards, a city with a population of 10 million is not outstanding in size. Hangzhou is the 10th largest city in the country. Nevertheless, it has recently begun to lay claims to the role of the e-commerce capital not only of China, but also of the whole world. It was here that Alibaba Group was founded in 1999 and located its headquarters. Apart from this giant company, the city is home to dozens of other large and successful technology companies, such as Kuaidi Dache (the Chinese Uber, the largest company in the world in terms of the number of subscribers in the field of automotive services) and Mogujie, a social network and a mobile application for online fashionable clothes shoppers (whose capitalisation is more than US$ 400 million)[20]. Fifty-seven participating companies in the Fortune-500 global list have made their investments in the city21. All in all, 470,000 companies are involved in e-business in the city – no wonder it is called the Chinese Silicon Valley.

Strategically located at the mouth of the Grand Canal, which has joined the Yellow River and the Yangtze since the Middle Ages, the city has always been an important trading centre. In 1993, as part of a large project aimed to accelerate the development of hi tech in the city, a special free economic zone was opened in Hangzhou, along with other 50 cities[22]. However, only Hangzhou was lucky enough to be the home town of Jack Ma, one of the first young entrepreneurs in China, who was carried away by the idea of e-commerce, and was able to achieve phenomenal success both in business management (Alibaba reached operating profitability in less than two years after foundation), and investor relations (at its inception, the company passed two rounds of funding, which brought it US$ 25 million).

The global nature of the business of Chinese Internet giants required that the authorities take special regulatory decisions, and in 2013 a special industrial park for e-commerce companies was opened in the city. The experimental cross-bordere-commerce zone, opened by the decision of the Government of China on June 29, 2015, was a new level of development. The project provides for government subsidies, but it is primarily aimed at simplifying the procedures of customs and tax registration of cross-border trade flows. Declaring of goods and reimbursement of customs duties on re-exported goods has been fully transferred into an electronic workflow. Opening foreign accounts for companies and individuals has also been simplified. Upon reaching the level of foreign trade turnover of US$ 1 million, a company is entitled to receive a one-time grant of up to CNY 30,000 (ca. RUB 300,000).

20 https://www.crunchbase.com/location/hangzhou/4407ffb38681e25011fadfafbc66c6b6
21 http://ecommercechinaagency.com/hangzhou-capital-of-e-commerce-in-china/
22 https://en.wikipedia.org/wiki/Special_economic_zones_of_China

funds from the regional budgets into digital projects. As the world practice of urban digital development shows (see the cases of Gurgaon and Hangzhou), an effective approach is to combine administrative, public, and private digital initiatives that respond to local demand and develop it.

An interesting feature of the development of digitalization in Russia is an uneven growth of supply and demand in certain aspects of urban life, and each region has its specific features. As a result, local and federal businesses have two possible strategic approaches:

- to ride the wave, that is, to create projects in the areas that have developed the highest in the region in terms of digitalization. In this case, businesses are likely to find themselves in tough competitive situation; however, they can benefit from the established markets; or
- to conquer a niche, that is, to work on supply in the undeveloped areas in the region, where competition is low, but demand must be created and developed.

The choice of a specific strategy is a combination of resource capabilities, corporate culture, and the overall business vision of each individual company. The aim of the administration on contrary, is rather to level the digital profile of the city, to ensure the most uniform development in all dimensions, and, most importantly, to match supply and demand.

It should be pointed out again that a low, often negative, correlation of supply and demand suggests the existence of considerable opportunities for the development of digital business in Russia. The sphere of education is a particularly vivid example, where the development of supply has not yet been able to match the explosive growth in demand. It is obvious that there are considerable unfilled niches in all the other aspects of urban life (perhaps with the exception of transportation in most cities). On the other hand, this picture shows the existing danger of the so-called digital gap – unequal opportunities for using modern technology – even between major cities of the country. An increase in this gap in the future may become a significant factor in the general growth of centrifugal tendencies in the Russian economy and demography, exacerbating the considerable imbalance in resource opportunities of capitals and regions.

Overcoming the digital gap in Russia and assuring the digital competitiveness of the regions on a global scale can be considered among the most important strategic objectives of socioeconomic development in the next decade. According to the Index presented in this report, the key to the solution of this problem is supply: the country needs a lively, competitive, localised culture of digital businesses that meet consumer demand through multidimensional ecosystems with multiple network effects.

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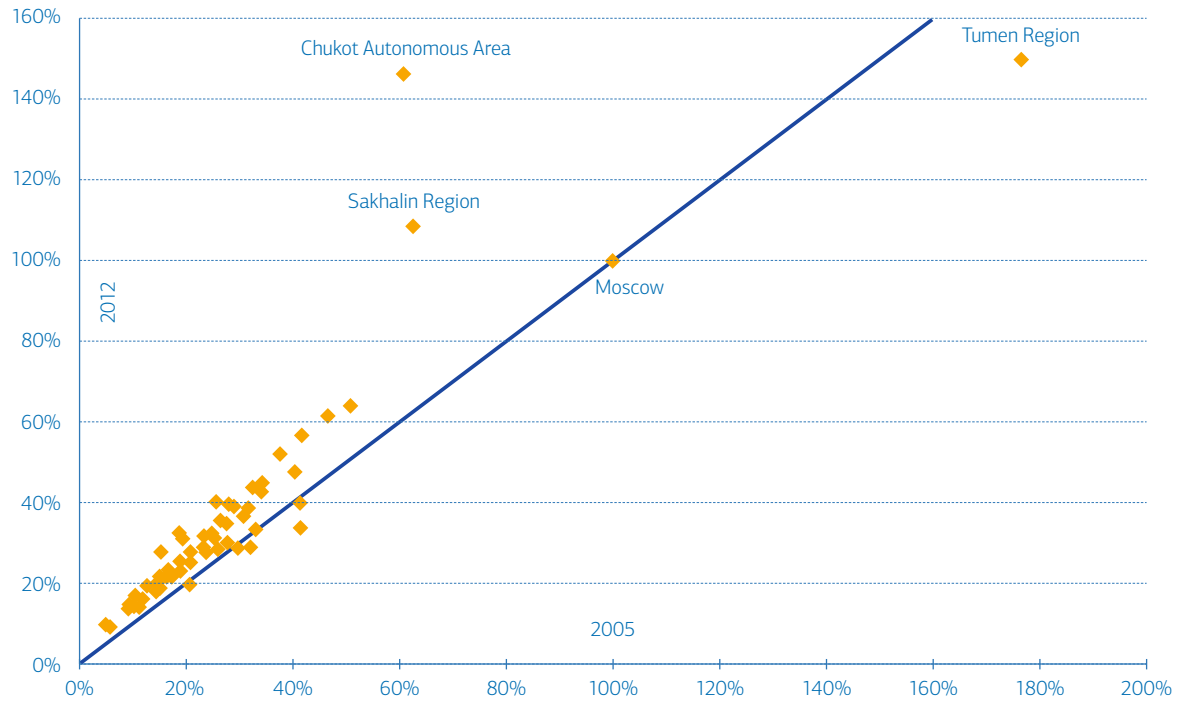
# II. Digital Life Index of the Russian Regions: General Analysis

## Russian Economy: A Disparity in Resources Between the Capital and the Regions

The current situation in Russia is characterised by a significant difference in economic opportunities of the capital (Moscow) and the majority of other regions. Only three regions have a level of per capita GRP that exceeds that of Moscow, and two of them—the Chukotka Autonomous Region and Sakhalin Region—are very small in terms of population. Over the past 10 years, there has been a slow convergence of most regions with the level of Moscow, but the average per capita GRP in the Russian regions is still about four times lower.

Certain disparities can be observed in the penetration of digital technology, e.g. in the percentage of population who regularly use the Internet. In 2015, the figure was more than 90% for Moscow, while for Perm and Volgograd it was just over 70%. This poses one of the key questions of the study: is the use of digital opportunities in everyday life directly derived from the Internet penetration rate, or are there more complex interdependencies? Can a city with more constrained economic possibilities become one of the leaders in the development of digital life?

**Graph 1. Dynamics of changes in per capita GRP in the Russian regions relative to Moscow.**




The regions above the diagonal line are converging towards Moscow, and those below the line are increasingly falling behind.

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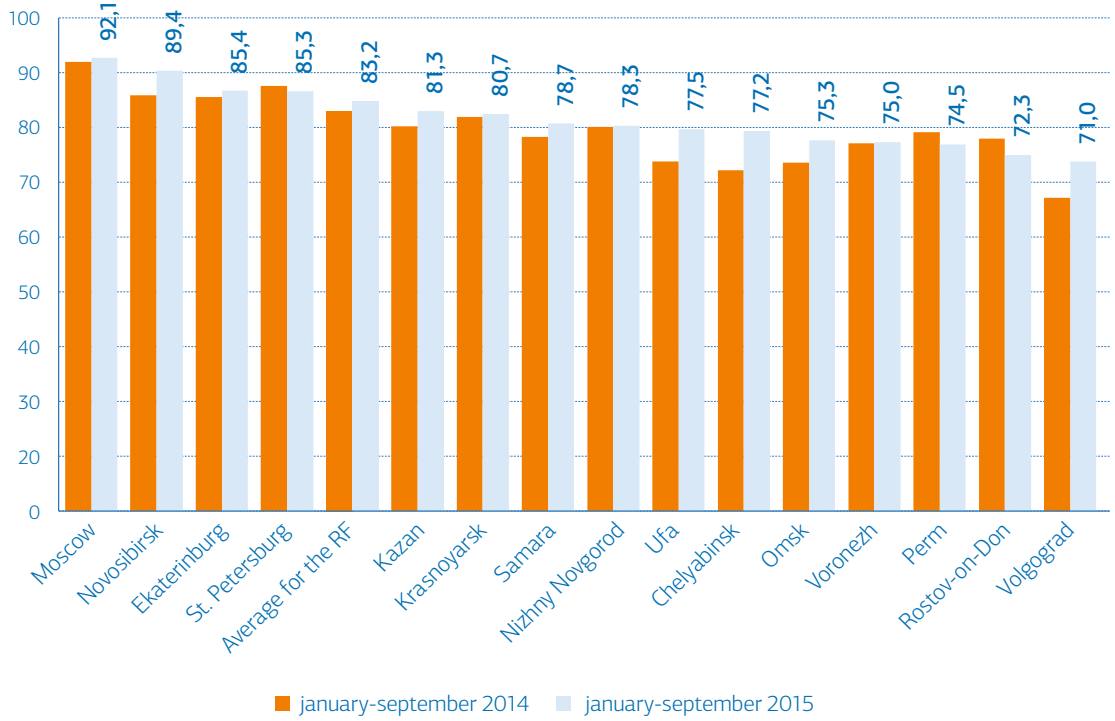
| Table 1. Key socioeconomic indicators of Russian millionaire cities | | | |
|---|---|---|---|
| | Population | per capita GRP, RUB | Industrial production per capita, RUB |
| Moscow | 12 108 257 | 873 536 | 185 089 |
| St. Petersburg | 5 131 942 | 446 615 | 455 188 |
| Novosibirsk | 1 547 910 | 241 471 | 57 960 |
| Ekaterinburg | 1 412 346 | 343 557 | 41 220 |
| Nizhny Novgorod | 1 263 873 | 255 554 | 60 277 |
| Kazan | 1 190 850 | 374 365 | 47 782 |
| Samara | 1 172 348 | 293 225 | 57 923 |
| Chelyabinsk | 1 169 432 | 241 630 | 94 067 |
| Omsk | 1 166 092 | 252 549 | 267 545 |
| Rostov-on-Don | 1 109 835 | 197 926 | 40 183 |
| Ufa | 1 096 702 | 283 584 | 103 251 |
| Krasnoyarsk | 1 035 528 | 418 044 | 56 401 |
| Perm | 1 026 477 | 340 496 | 187 887 |
| Volgograd | 1 017 985 | 223 383 | 122 143 |
| Voronezh | 1 014 610 | 244 143 | 37 356 |

**Development of primary digitalization: Internet penetration rate in millionaire cities**




% of population using the Internet at least once per month[23]

## Secondary digitalization of Russian millionaire cities

It can be stated that Russian millionaire cities moved to the stage of secondary digitisation in 2015, when all of them reached a proportion of people regularly using the Internet of more than 70% (Volgograd made a significant breakthrough compared with 2014). This penetration rate allows for building digital systems which can be used by the majority of the population, with the digital behaviour – the habit thorough use of digital technology in everyday practices – turning from a niche phenomenon to a dominating one. This makes it possible to expect the launch of network effects and development of holistic multidimensional ecosystems in the digital economy.

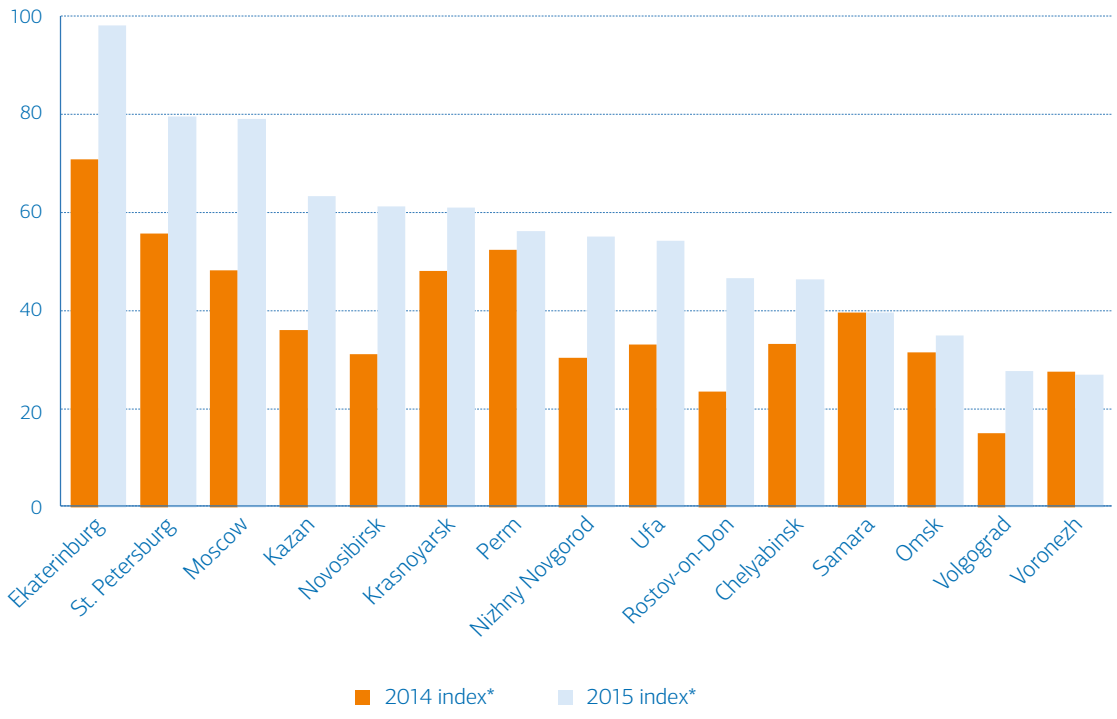
Secondary digitalization of major Russian cities is developing very rapidly. In one year from late 2014 to late 2015, the average Digital Life Index grew almost by half – from 0.38 to 0.55. The three leading cities stayed the same – Ekaterinburg, St. Petersburg, and Moscow, while the latter had developed rapidly and had almost reached second place. Kazan and Novosibirsk ranked fourth and fifth, ahead of Perm, Krasnoyarsk, and Samara. Volgograd and Voronezh were in the bottom of the rating, but they have changed places between them. Rostov-on-Don is currently the most dynamically developing city.

23 Russian Target Group Index

Analysing the combination of the dynamics and the status quo of digital life development in the regions, we can distinguish four groups:

- Strengthening the Leadership: high current performance and high dynamics. This group includes Novosibirsk, Kazan, Moscow, and St. Petersburg, which develop at a faster pace than the leader of the ranking (Ekaterinburg) and have Index indicators higher than the average;
- Stable: cities with high current performance indicators but low growth dynamics. This group includes Perm and Krasnoyarsk, which had lost their relative rankings of 2014;
- Catching-up: low current performance, but with dynamics that are higher than those of the leader of the ranking. This group includes Rostov-on-Don, Volgograd, Nizhny Novgorod, Ufa and Chelyabinsk. Yet, Nizhny Novgorod and Ufa are close to the sample average in terms of the current Index value (that is, on the border with the Strengthening the Leadership group), and the development dynamics of Chelyabinsk are only slightly higher than those of the leader of the rating – the city is on the border with the Lagging Behind group;
- Lagging Behind: low current rates and weak dynamics. The group includes Samara, Voronezh, and Omsk.

**Changes in the Digital Life Index in 2014–2015**

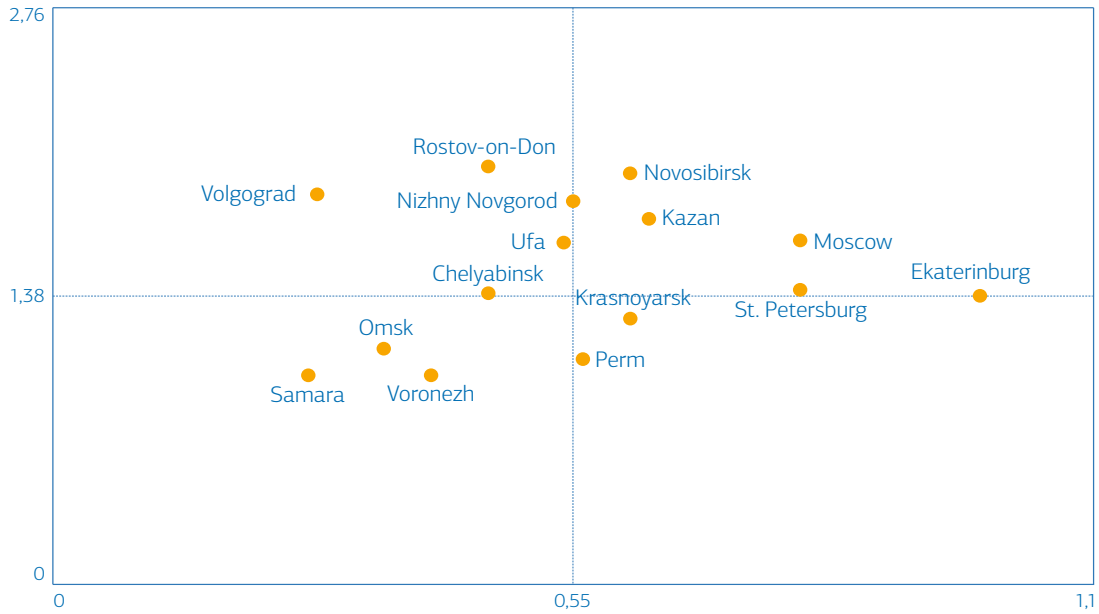


The growth of the quality of digitalization is mainly due to the development of demand, its average index increased by almost twofold, from 0.39 to 0.73 during the year. The level of supply at the end of 2015 was even slightly lower than the previous year – 0.37 versus 0.378. A decrease in supply was particularly strong in Perm, Voronezh, Krasnoyarsk, and Ekaterinburg. This decrease was almost entirely caused by the reduction in regional digital supply in the area of finance due to the economic stagnation and the policy of the national regulator, aimed at the consolidation of the industry, because of which a number of smaller banks with developed digital services left the market[24].

An important result of the diverging dynamics of supply and demand was the decrease in correlation between them from 0.7 to 0.4. A decrease in correlation was observed in 10 of 15 cities, and in seven of the cases, the change was dramatic: in Chelyabinsk, Voronezh, Ufa, Rostov-on-Don, Perm, Ekaterinburg, and Nizhny Novgorod the positive coefficients turned negative (i.e. supply and demand began to develop in opposite directions). In five cities the correlation coefficients grew, but only in two cases – in Moscow and St. Petersburg – the growth was significant, and the relation changed from negative to positive.

In the context of digital life dimensions, correlation significantly decreased in finance, administration, and education (in the latter case, the widespread significant growth in demand has not yet been matched with an adequate supply). The only dimension in which correlation increased was the media, and this was due to both a somewhat growing supply, and lower demand in some regions.

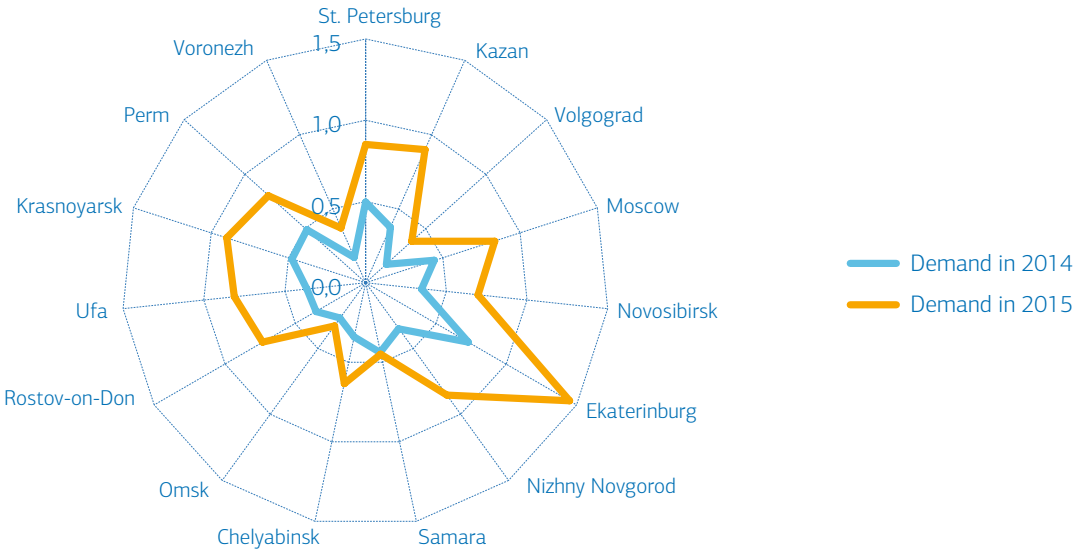
**Dynamics of Digitalization**



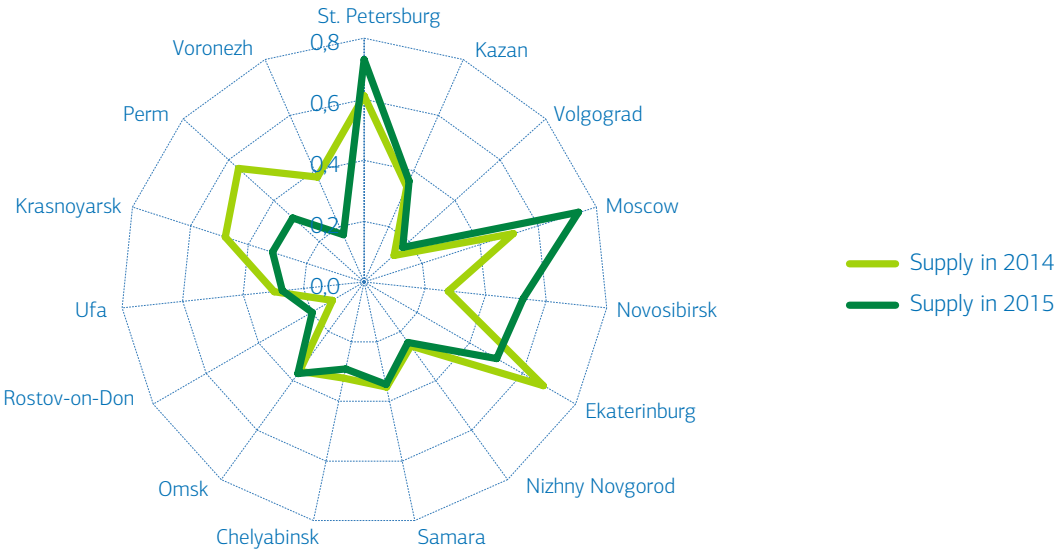

Four groups of cities in terms of digitalization dynamic.

24 Cf. the example of the Bank24.ru from Yekaterinburg, which got its license revoked in September 2015. The innovative technologies targeting small businesses were later acquired by a federal market player, Otkrytiye Group

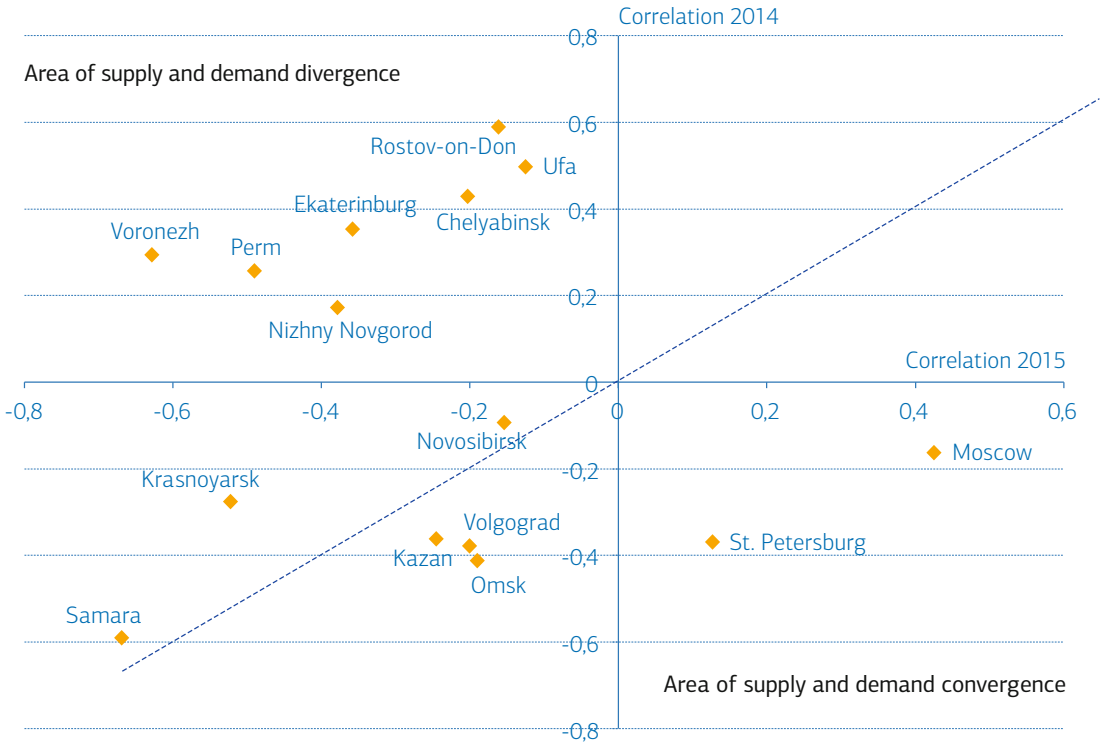
## Graph. Dynamics of demand by city




## Graph. Dynamics of supply by city



**Graph. Dynamics of correlation by city.**




The cities below the supply/demand diagonal line are converging, and those above the diagonal are diverging

**Table. Dynamics of correlation by industry.**

| | Transportation | Finance | Retail | Healthcare | Education | Media | Administration |
|---|---|---|---|---|---|---|---|
| **Correlation in 2015** | 0,1703203 | 0,184011 | 0,491053 | 0,325659 | -0,08035 | 0,647786 | -0,15856 |
| **Correlation in 2014** | 0,1980879 | 0,301258 | 0,506119 | 0,488125 | 0,179548 | 0,367579 | 0,094995 |

A significant decrease in correlation is highlighted in red, and a significant growth in green.

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# III. Digital Life dimensions

## Transportation

According to the Index, transportation digitalization stagnated in the period between the two waves of the study. On average, a slight increase in supply was offset by a decline in demand. These dynamics are probably due to the fact that currently digital transportation systems have reached the point of market saturation. In some cities, previously installed systems of electronic boards at transport stops were switched off or were not maintained (with massive breakdowns).

**Demand:** by 2015, demand had increased the most in Perm and Ekaterinburg, while in St. Petersburg and Moscow demand had decreased.

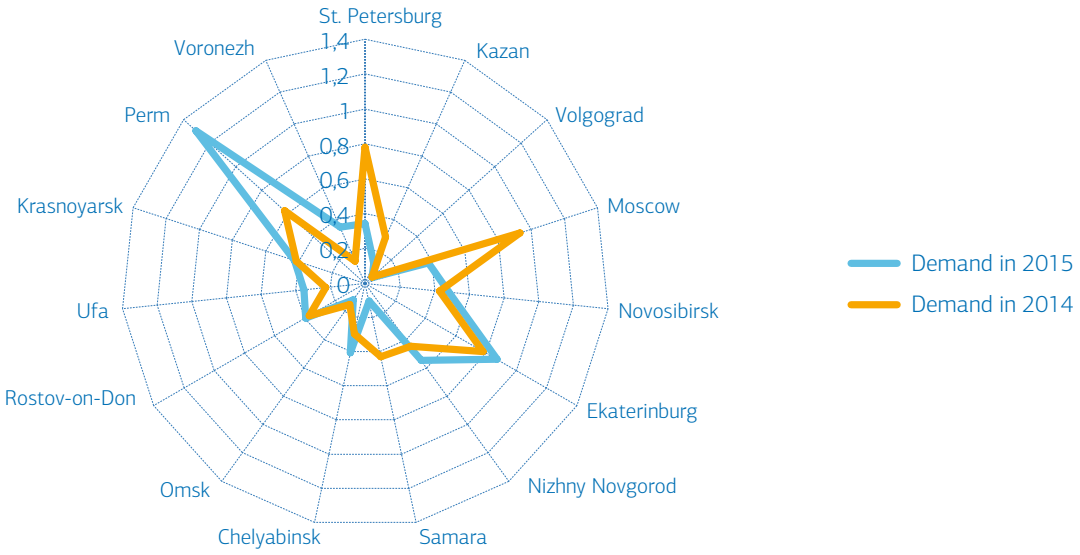
**Supply:** the highest growth of supply was in Moscow and Chelyabinsk; supply also increased in Kazan, Ufa, Samara, and Rostov-on-Don. In the other cities, however, supply decreased: complex systems deployed in many cities had been reduced due to the economic situation.

**Correlation:** the measurement is characterised by a weak positive correlation (0.19 in 2014 and 0.17 in 2015).

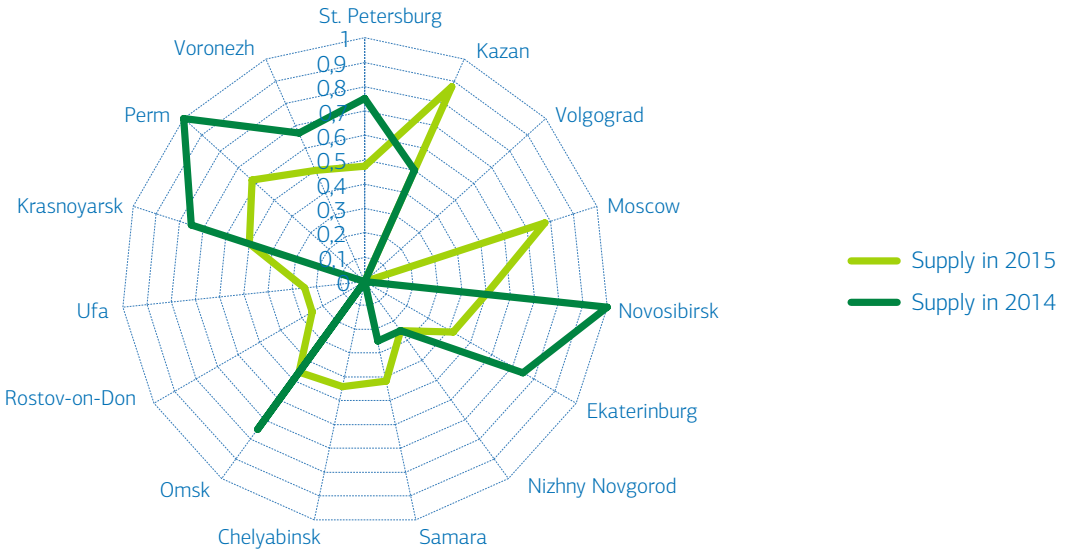
Productive life in modern cities is associated with frequent, long, and diversified trips; therefore the transportation system capabilities play an essential role in the assessment of the quality of urban life. At the same time, the accessibility and comfort of public transport reduces the use of private vehicles, which normally improves the traffic situation and the environment. An important contribution of digital systems to the solution of transportation problems in cities is the development of the online schedules and information displays at transport stops, which are continuously updated in real time. Based on such systems, it is possible to create more complex solutions that optimise routing using elements of predictive analytics and artificial intelligence, especially in cities with several alternative means of transportation. The most radical future development probably lies in the sharing of personal transport on the basis of Uber-type platforms, which allow people to receive transportation services in the right place at the right time. The boom of such systems is expected with the arrival of quality self-driving cars on the market. Now an ordinary car owner uses his/her car only a few hours a week – to get to work and back home and to travel on weekends. In theory, a self-driving car will be able to work without downtime and with minimal empty rides, which is expected to reduce the number of cars necessary for transportation by order. The first experiments with self-driving passenger cars in a real city began in September 2016, when Uber put four cars on a route in Pittsburgh, USA[25]. Of course, there are many social, psychological, and even legal barriers to sharing personal vehicles, but the potential benefits are enormous, especially in emerging markets with relatively low motorisation.

25 http://www.independent.co.uk/life-style/gadgets-and-tech/news/uber-launches-self-driving-taxis-with-people-unknowingly-getting-picked-up-by-autonomous-vehicles-a7197486.html

## Graph. Dynamics of digital demand in transportation




## Graph. Dynamics of digital supply in transportation



## Finance

As mentioned above, the digitalization of finance decreased significantly in 2015 due to the withdrawal from the market of a number of smaller banks that had been the leaders in the ratings of Internet and mobile banking. At the same time, the demand for digital finance increased considerably in most cities.

**Demand:** the most developed demand was observed in Ekaterinburg (doubled since the previous year), followed by Novosibirsk, Krasnoyarsk and St. Petersburg. Demand only decreased in Samara and Ufa.

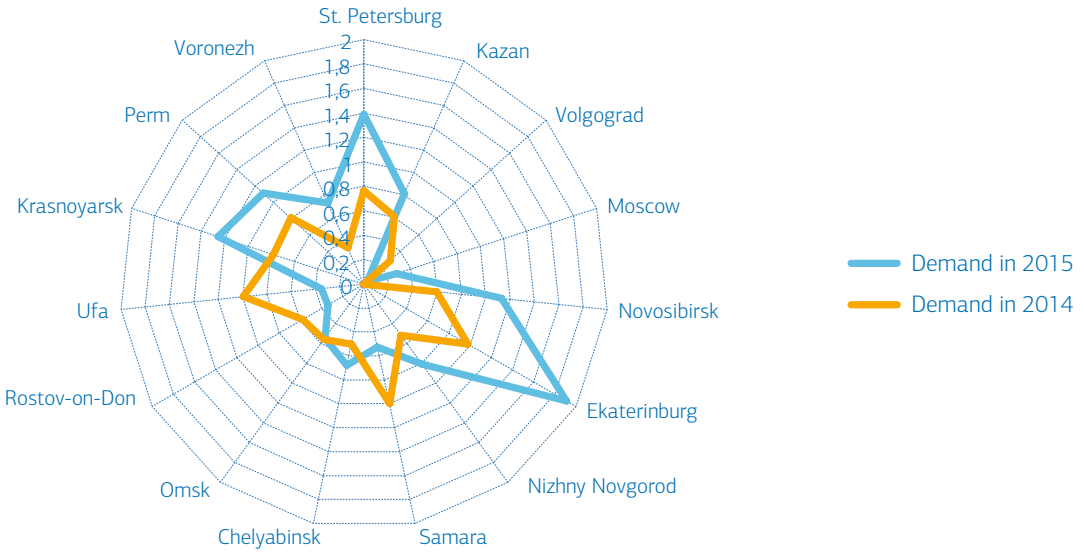
**Supply:** supply had significantly decreased in all the cities under analysis, while the decrease in Ekaterinburg, Novosibirsk, and Ufa was *the least*.

**Correlation:** the pronounced positive correlation (0.3 in 2014) had changed into a weak one by the second wave of the study.

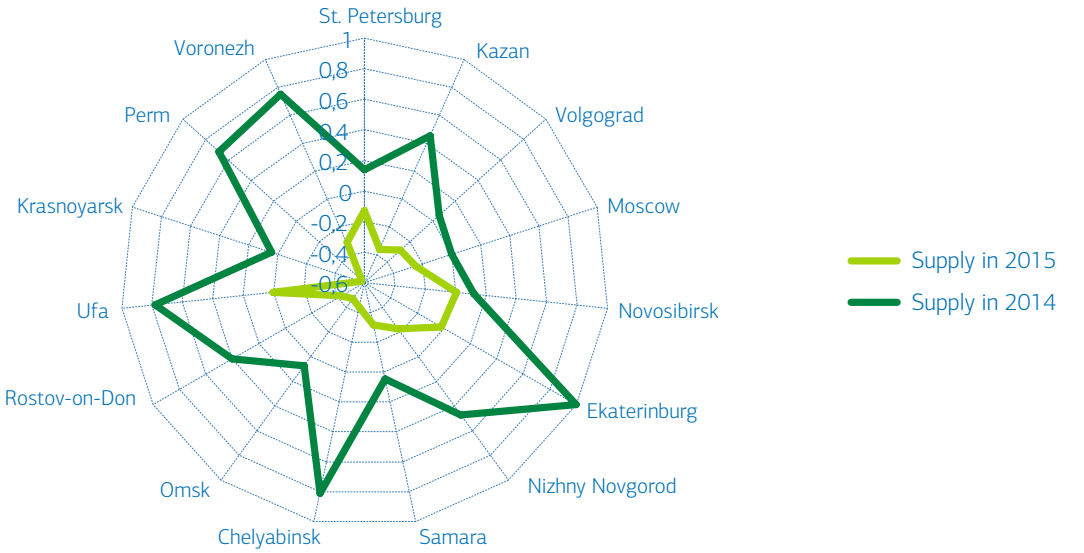
Digital transformation in finance has been one of the most debated topics in recent years. The development of global non-cash payments, cryptocurrencies, P2P lending platforms,[26] etc. is seriously altering the landscape of consumer financial services. Traditional banking services – payments, deposits, currency exchange – are becoming available virtually around the clock anywhere in the world with access via the Internet or mobile devices. At the same time, the financial industry receives significant amount of government regulation (intensified around the world after the financial crisis of 2008 with the introduction of banking standards Basel II and Basel III), as well as the ever-increasing attention of government authorities to the monitoring of financial activity in order to prevent money laundering and financing of the terrorism. As a result, financial market players find themselves in a complicated situation, in which the possibilities of using digital technology to attract customers and improve the quality of their services are often directly or indirectly limited by regulatory rules. Despite this, many Russian banks, both large and relatively small, have created world-class online and mobile applications[27].

26 Systems that allow an individual to provide private loans to an individual or a small business.
27 Ranking of the best online and mobile banks in Russia was provided by Markswebb

## Graph. Dynamics of digital demand in finance




## Graph. Dynamics of digital supply in finance



## Retail

According to the Index, retail digitalization had risen slightly, with an increase in demand in most of the cities (it is impossible to assess the dynamics of supply due to the changes in the methodology of the study).

**Demand:** in 2015, the highest growth of demand was observed in Moscow (by factor of three), St. Petersburg (by factor of four) and Kazan (by factor of three). Demand fell slightly in Ekaterinburg, Rostov-on-Don, Krasnoyarsk, and Ufa.

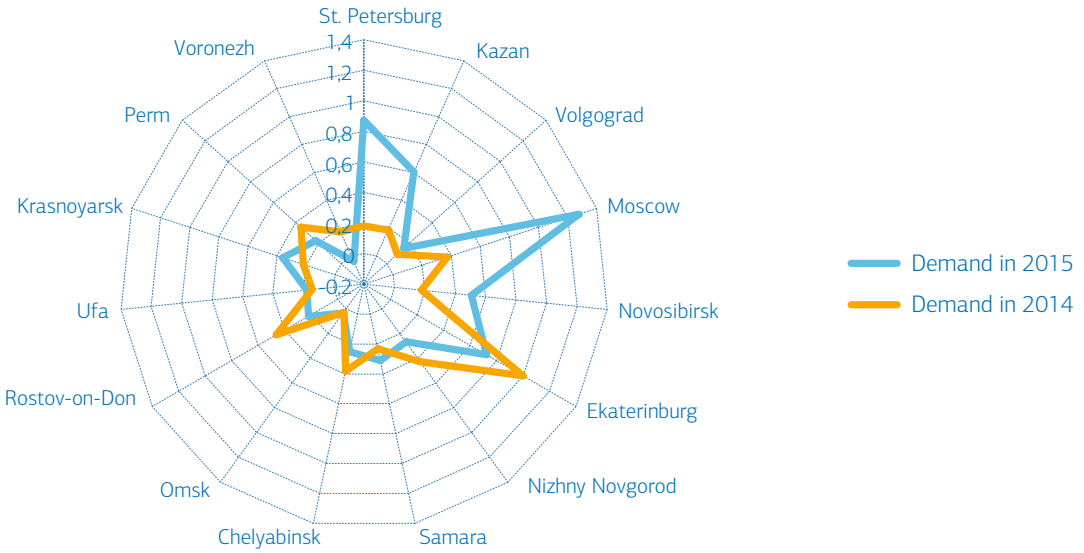
**Supply:** due to the changes in the methodology of the study, comparison of data for 2014 and 2015 will not be correct. In 2015, St. Petersburg, Ekaterinburg and Nizhny Novgorod were characterised by the highest supply.

**Correlation:** retail is characterised by the second best positive correlation (0.5) among all the dimensions, second only to the media.

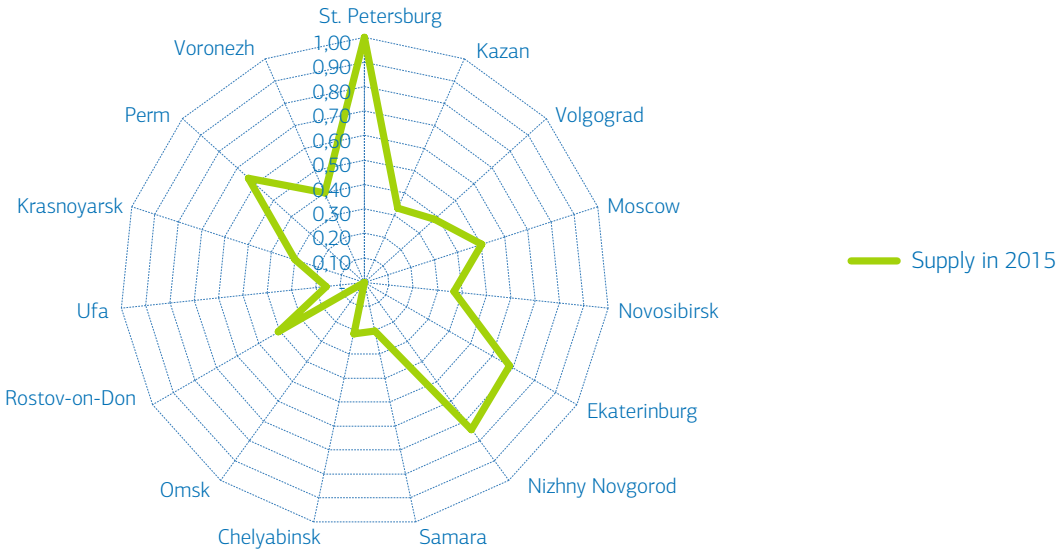
Surprising as it may seem, e-commerce appeared nearly 15 years before the emergence of the modern Internet – the first system, which entered the market in 1979 in the United Kingdom, used the teletext in TV sets and voice ordering of goods[28]. However, commerce started to become a truly global phenomenon online with the emergence of players such as Amazon.com and eBay in 1995. Then, few could imagine that the American giants would be displaced in most global markets by a company from China, but today it is Alibaba corporation that is the leader in e-commerce turnover in the world. The first Internet shop in Russia, which sold books (now called books.ru), opened on August 30, 1996[29]. Today, you can buy almost anything from food to exotic tours online, but the market is characterised by highly intense competition; Russian projects have to confront prices and the range of goods offered by global leaders, first of all Alibaba from China.

9 https://en.wikipedia.org/wiki/Online_shopping
10 https://ru.wikipedia.org/wiki/%D0%A0%D1%83%D0%BD%D0%B5%D1%82, http://pro-books.ru/news/companynews/7784

## Graph. Dynamics of digital demand in retail




## Graph. Dynamics of digital supply in retail



## Healthcare

Healthcare showed a significant increase in digitalization, mainly in demand, but also in supply in some cities.

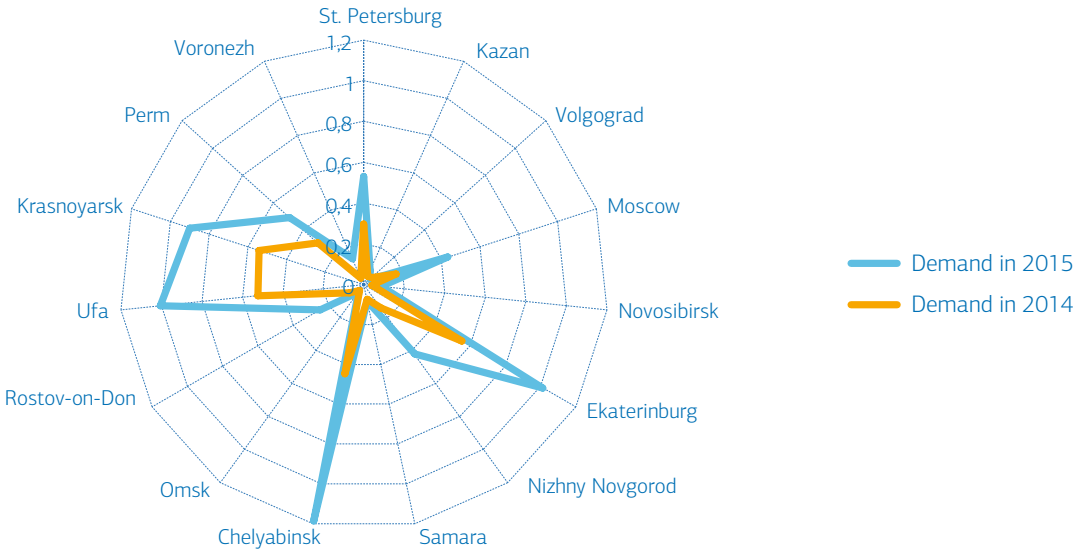
**Demand:** the most significant was the growth in demand in Chelyabinsk, Ufa, Krasnoyarsk, and Ekaterinburg.

**Supply:** there was a considerable growth in Kazan, Rostov, and Volgograd; the only city where supply decreased was Voronezh.

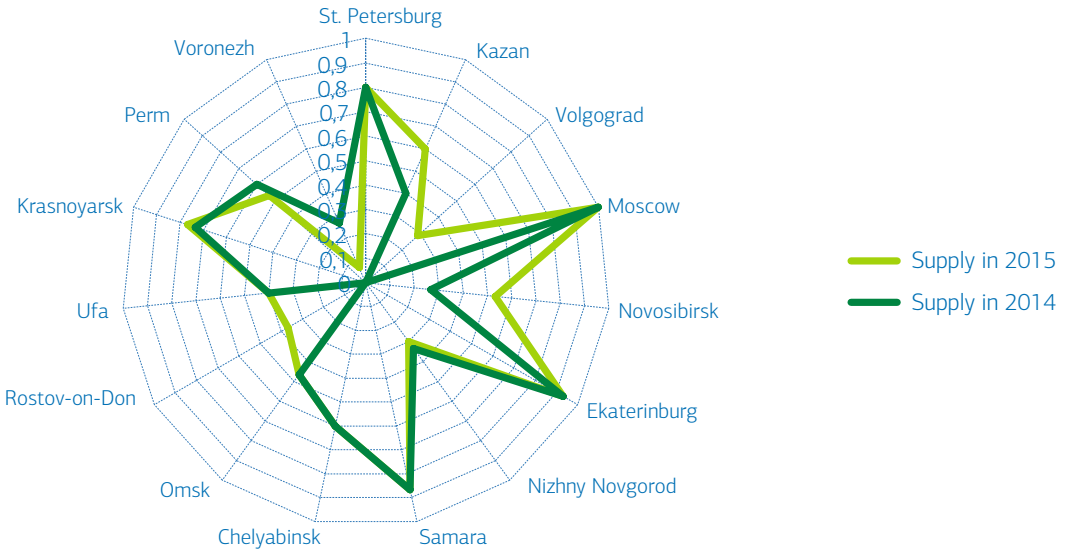
**Correlation:** significant positive supply/demand correlation (0.48 in 2014) decreased slightly (0.32).

One of the largest global social challenges is to provide universal access to high-quality healthcare. A key barrier to the solution of this problem is economics: modern medicine requires doctors with more and more focused specialisation; highly qualified specialists are rare and expensive. At the same time, diagnostic procedures become increasingly complex, the amount of data available for testing increases, and the time a skilled specialist spends working with the patient grows proportionally. It is expected that a new generation of digital systems, combining the possibilities of telemedicine, i. e. remote work with medical specialists, with analytical applications of artificial intelligence trained by the global array of clinical cases, will create a breakthrough in the cost effectiveness, accessibility and quality of healthcare. However, to ensure that these systems can be fully operational, it is necessary to do a huge amount of preparatory work, in particular, to digitise the existing medical case histories with the results of tests and diagnoses, to create reports and health data exchange tools (taking into account the need to maintain patient confidentiality), and to train experienced clinicians to interact with the new ideology of digital applications. The future opens up even more revolutionary possibilities: individualised treatment and later prevention of diseases based on analysis of the human genome. According to the forecast by MarketsandMarkets agency the global market of telemedicine and mobile healthcare will grow at the rate of CAGR 33,4% for the coming 5 years; reaching the volume of almost USD 60 bn by 2020. Thus the world in general and Russia in particular are in the very beginning of the digital transformation in healthcare.

## Graph. Dynamics of digital demand in healthcare




## Graph. Dynamics of digital supply in healthcare



## Education

Education became the fastest growing dimension, which is characterised by a particularly significant increase in demand (the sample average—by a factor of 3.5).

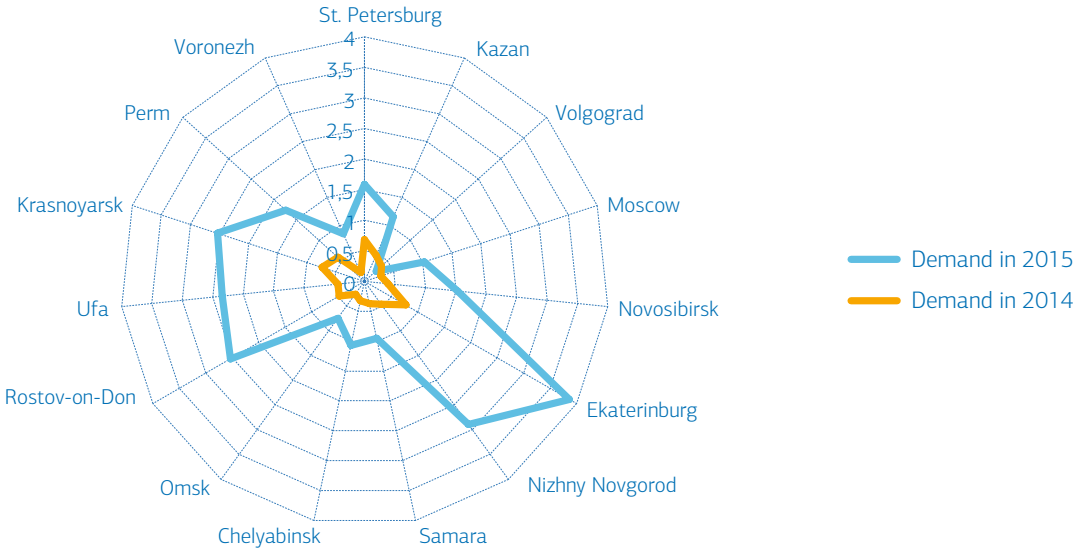
**Demand:** in terms of growth, the leaders were Ekaterinburg (by a factor of five), Nizhny Novgorod, and Rostov-on-Don.

**Supply:** education is the only dimension where digital supply is practically unavailable in most of the selected cities. In 2015, only Omsk joined the leaders—Ekaterinburg, Moscow, and St. Petersburg.

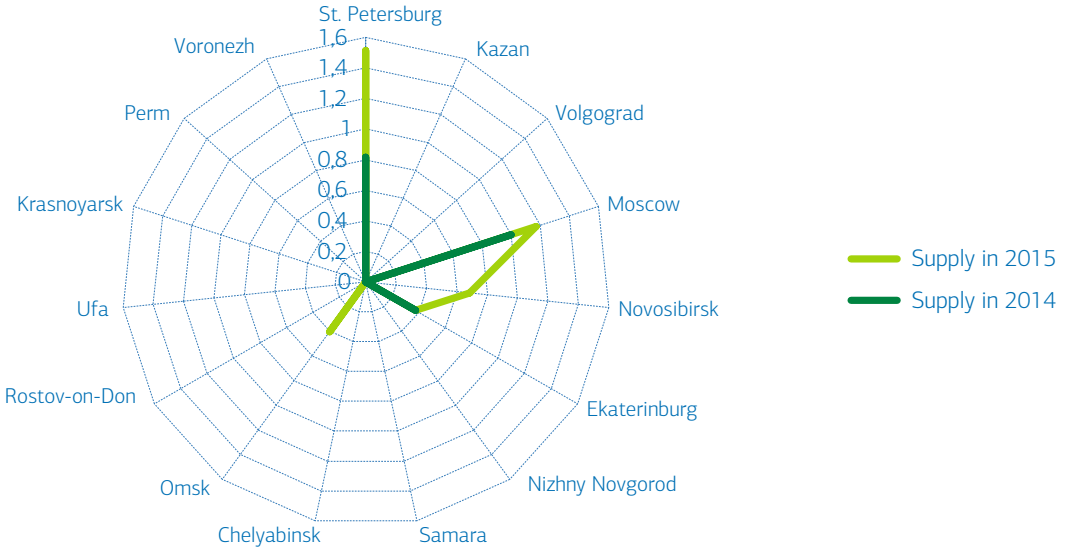
**Correlation:** there is virtually no correlation between supply and demand in this dimension (-0.08).

As with healthcare, education is at the very beginning of digital transformation. The explosive popularity of the so-called massive open online courses (MOOC) worldwide means that soon the traditional financial and logistical barriers to the obtaining of first-class higher education will be significantly reduced. The same situation places small local higher educational institutions in a new environment —they begin both to compete and collaborate with the world's best universities. No fewer opportunities open in secondary and primary education, which can become much more visual, interactive, and high-quality in content. Opportunities for self-training and self-education are increasing exponentially with the development of online encyclopaedias, dictionaries, libraries, and, last but not least, social networking. After all, famous Facebook was created at a time when Mark Zuckerberg, being a college student, had to resort to the help of his group-mates in order to meet the deadline for his homework.

## Graph. Dynamics of digital demand in education




## Graph. Dynamics of digital supply in education



## Media

In most cities under analysis, there was a small increase in demand in the area of the media.

**Demand:** demand was almost the same in all the cities, except for Volgograd and Omsk.

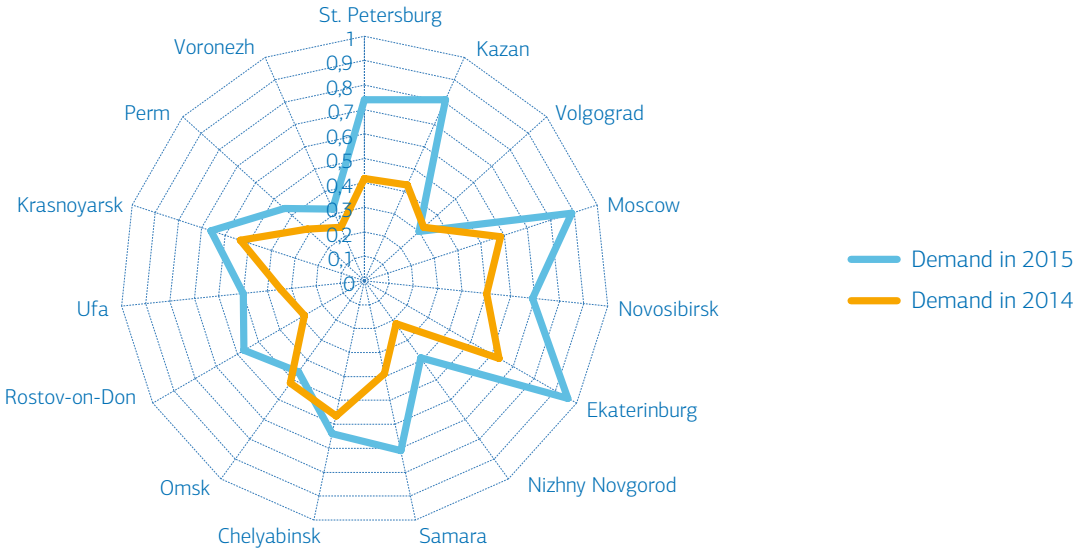
**Supply:** due to the changes in the methodology of the study, comparison of data for 2014 and 2015 will not be correct. In 2015, Moscow ranked first in terms of the media, and the other cities with notable development included Ekaterinburg, Kazan, St. Petersburg, and Novosibirsk.

**Correlation:** it was the only dimension that demonstrated a significant growth of correlation—from 0.37 to 0.65.

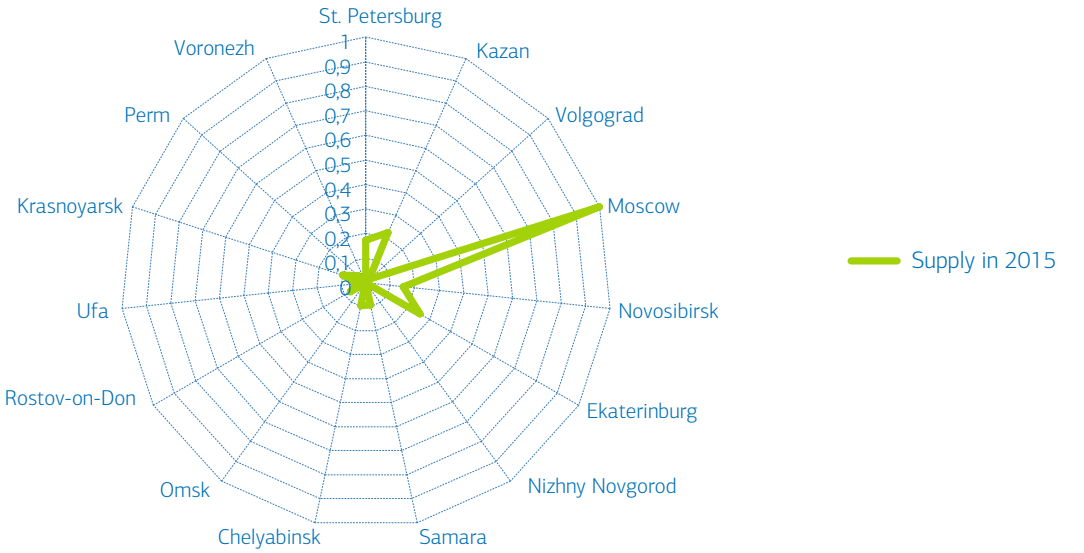
It is difficult to say when exactly the phenomenon of digital media appeared; a number of researchers believe that this happened with the spread of the telegraph in the 19th century[30]. Perhaps it is the media that is affected by the processes of digital transformation more than any other industry, and these processes do not show any signs of slowing down just yet. By its nature, new – i. e. information – is an area of constant digital development. One direction is associated with the transformation of consumer access devices: TV set – PC – Phone – Smartphone – Tablet, and further. Another one is related to the emergence of new channels, and transmission and presentation formats. The boom of social networking in the early 2010s started an era when Internet users themselves created web content on a massive scale, which gave rise to a huge number of challenges in the field of reliability and quality of information. At the same time, technology enabled full online access to videos, which triggered an explosive growth of information in the form of short story clips. The news channels in mobile messengers, such as Telegram, are a relatively recent successful innovation. It is a unrewarding job to predict future media formats. It is sufficient to read the forecasts of the early 21st century to see that the chances to forecast the development even for the next five years in any detail are extremely small (e.g. Internet-enriched TV, which was much expected at a certain time, never materialised). One thing is for sure – we will see many a radical innovation in the field of digital media.

30 Tom Standage: The Victorian Internet: The Remarkable Story of the Telegraph and the Nineteenth Century's On-line Pioneers – Blumsbury, 1998

## Graph. Dynamics of digital demand in the media




## Graph. Dynamics of digital supply in the media



## Administration

Digitalization of city administration showed rapid increase in both demand and supply. As to the growth of demand, this dimension was second after education, while in terms of an increase in supply it was an absolute leader.

**Demand:** significant growth in Kazan (by about a factor of five), Moscow, Ufa, and Rostov-on-Don.

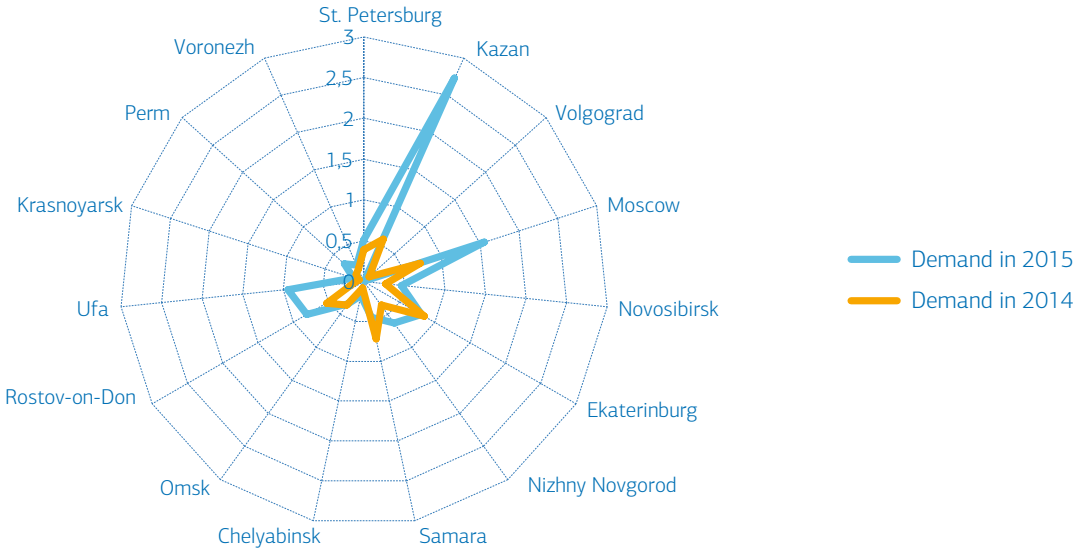
**Supply:** significant growth in almost all the cities (except for stagnation in Voronezh, and decrease in Ufa). As a result, Moscow, St. Petersburg, Perm, and Omsk were the leaders in the development of the city administration digitalization.

**Correlation:** the supply/demand ratio remained low, and the correlation coefficient decreased from 0.09 to -0.16.

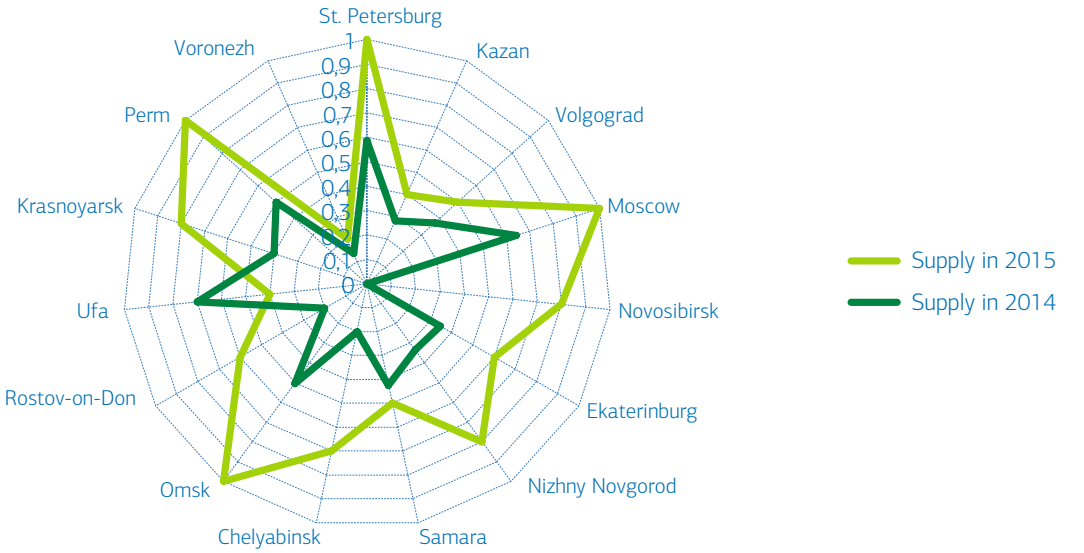
The Russian E-Government Programme was developed at the federal level in 2008 and adopted in 2009, but even before that, many regions had begun making serious steps to build multifunctional portals of local administrations, which gradually developed from simple awareness raising towards the provision of an increasing number of services online – in whole or in part (e.g. orders for various kinds of physical documents). In the E-Government Development Index, published by the United Nations, Russia ranks 35th (and 34th in terms of e-participation), and is included in the group of countries with a high development level[31]. In recent years, despite the economic slowdown, many regional administrations have invested significant resources in the development of electronic services, which is, in general, easy to explain: in addition to improving the quality of interaction between government and citizens, the digitalization of many labour-intensive operations with documents makes it possible to use administrative personnel more effectively. There is, however, a worrying trend – a complete absence of correlation between demand and supply in this area: on the one hand, a significant portion of frequent users of public services have technological or psychological difficulty in using advanced digital services; on the other hand, administrations often create huge portals with hundreds of services (the record number registered during the study is more than 1,800) with ineffective user interfaces, making it almost impossible to find the right application

12 http://workspace.unpan.org/sites/Internet/Documents/UNPAN96407.pdf

## Graph. Dynamics of digital demand in administration




## Graph. Dynamics of digital supply in administration



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# IV. Digital Life of Cities

## 1. Ekaterinburg

Ekaterinburg became the leader of the ranking for two consecutive years due to the balanced growth of supply and demand.

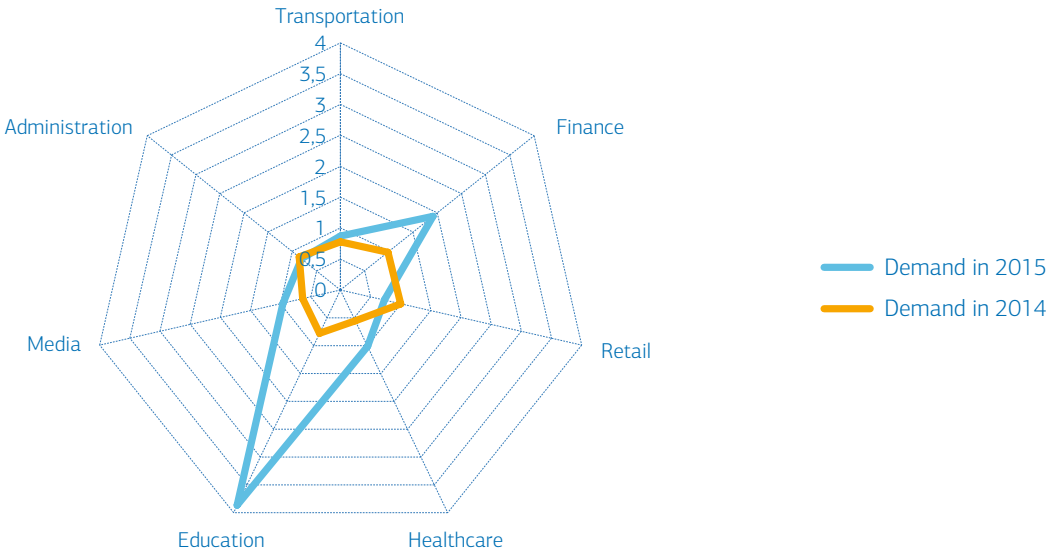
**Demand:** in 2015, demand in the area of finance and education sharply increased; there was slightly smaller growth in healthcare and transportation.

**Supply:** in 2014, Ekaterinburg held the leadership positions in supply in the fields of finance, retail, transportation, and healthcare; in 2015, supply in the field of finance and retail decreased, but the city showed growth in administration and digital media (Ekaterinburg is home to Znak—one of the few media projects outside of the country's capitals that attracted national popularity).

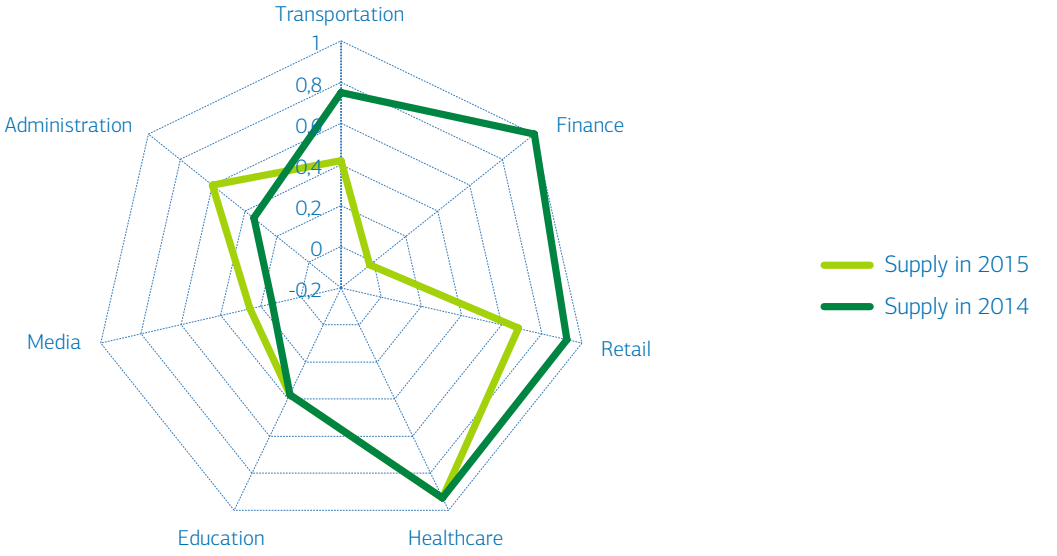
**Correlation of supply and demand** decreased sharply, reversing sign to negative: from 0.35 to -0.35.

| | 2015 | 2014 |
|---|---|---|
| **1st place** | Demand: finance, media, education | Demand: finance, retail, healthcare, education, media, and administration<br>Supply: finance |
| **2nd place** | Demand: transportation, healthcare<br>Supply: healthcare, media | Supply: retail, healthcare |
| **3rd place** | Demand: retail<br>Supply: finance, retail | Demand: transportation, finance<br>Supply: transportation, education, media |

## Graph. Dynamics of digital demand in Ekaterinburg




## Graph. Dynamics of digital supply in Ekaterinburg[32]




32 Due to the change in the methodology the comparison of figures for media and retail is not possible, the values of 2014 for these dimensions are given for illustrative purpose only

## 2. St. Petersburg

During the two waves of the research, St. Petersburg confidently held second place in the ranking.

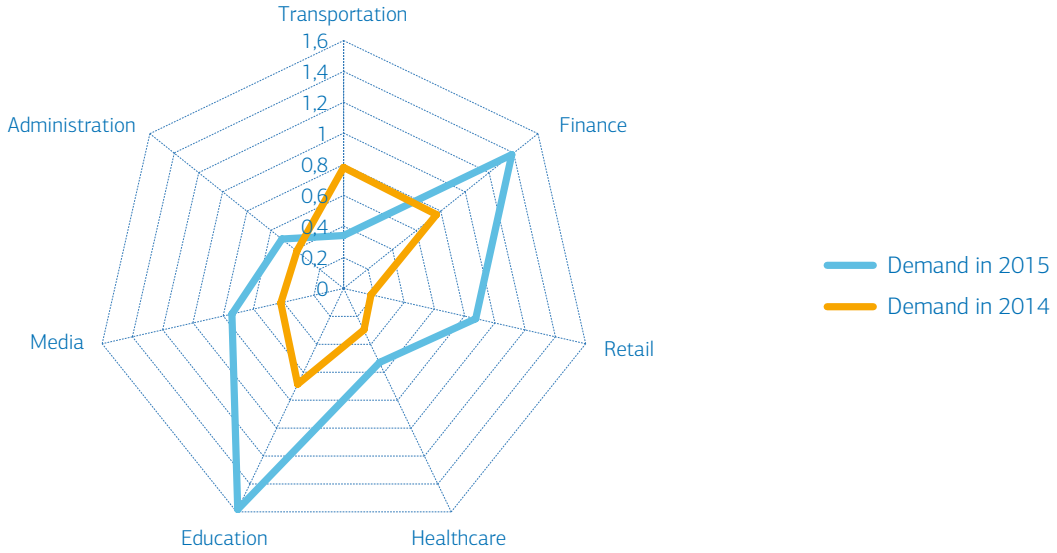
**Demand:** in 2015, demand was highest in digital finance (an almost twofold increase) and education (a nearly threefold increase); also there was a growth of demand in e-commerce, healthcare, and the media, while the interest in digital transportation decreased.

**Supply:** in 2015, supply grew in the fields of education and administration, and decreased in media and finance.

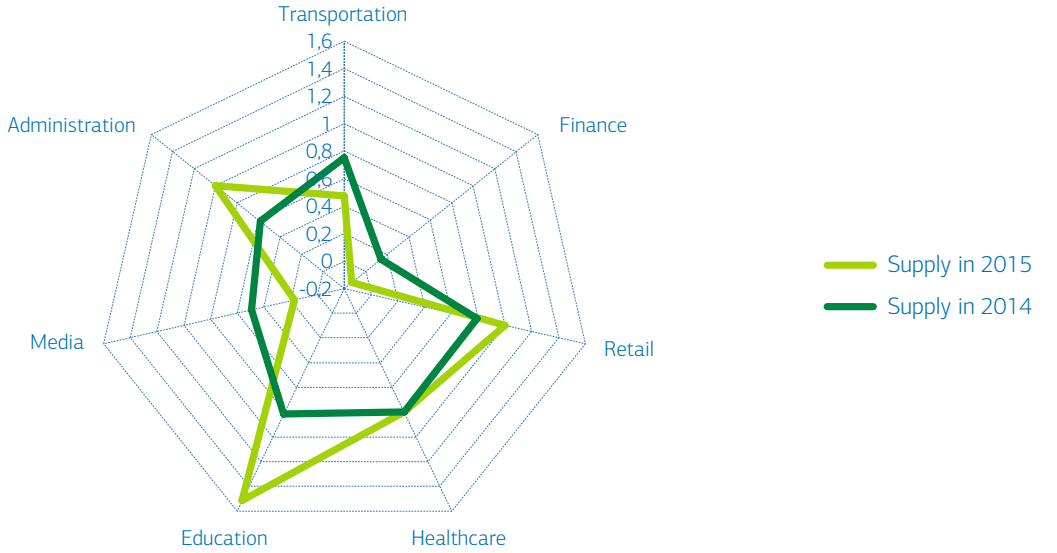
**Correlation:** the supply-to-demand ratio improved, changing from significant inverse correlation coefficient (-0.36) to a weak positive one (0.12).

| | 2015 | 2014 |
|---|---|---|
| **1st place** | Supply: retail, education, administration | – |
| **2nd place** | Demand: finance, retail | Demand: transportation<br>Supply: education, media |
| **3rd place** | – | Demand: education<br>Supply: transportation, administration |

## Graph. Dynamics of digital demand in St. Petersburg




## Graph. Dynamics of digital supply in St. Petersburg[33]




33 Due to the change in the methodology the comparison of figures for media and retail is not possible, the values of 2014 for these dimensions are given for illustrative purpose only

## 3. Moscow

For two years in a row, Moscow had held third place in the ranking, but in 2015 it was among the cities with the fastest growing Digital Life Index, having almost caught up with St. Petersburg.

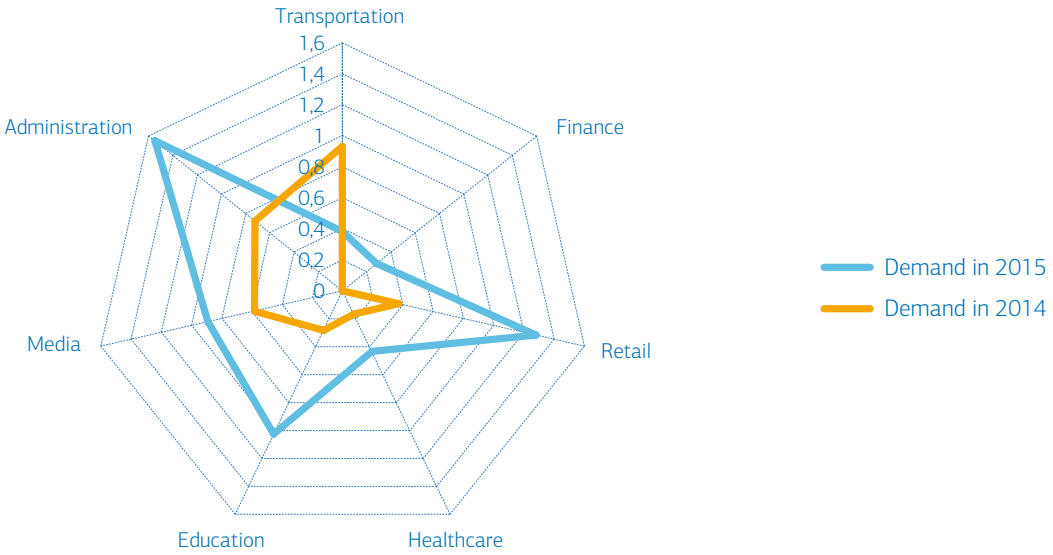
**Demand:** there was a significant increase in demand in almost all dimensions, except for transportation. Especially notable was the growth in demand in digital administration (by a factor of three; this was probably associated with the development of the *Active Citizen* portal), as well as in finance and e-commerce.

**Supply:** in 2015, there was a significant increase in digital supply in the field of transportation (due to the inclusion of the city in the directory service Yandex.Transport) and city administration.

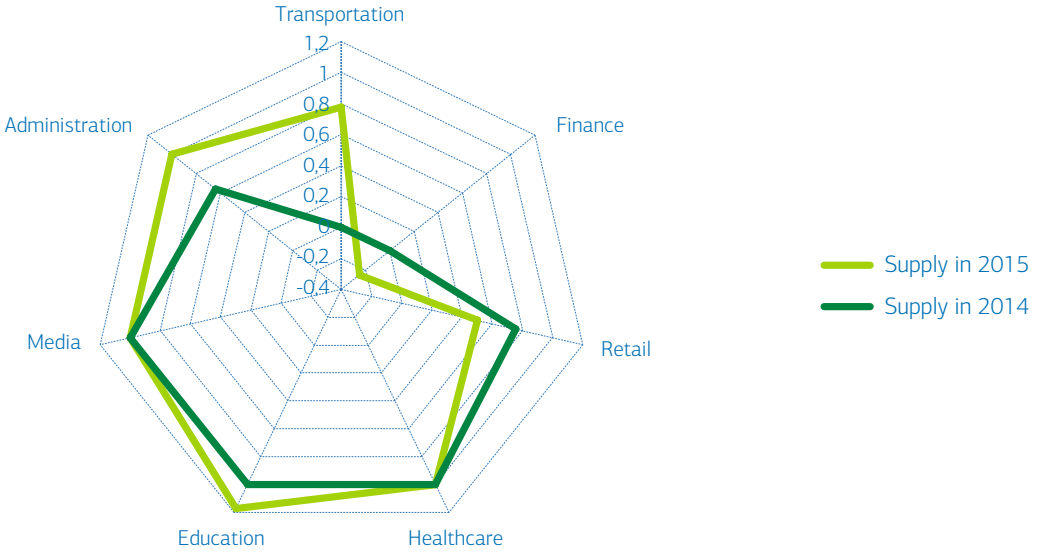
**Correlation:** Moscow was one of the two cities with significantly improved supply-to-demand ratio, whose correlation coefficient changed from a slightly negative (-0.16) to an essentially positive value (0.42).

| | 2015 | 2014 |
|---|---|---|
| **1st place** | Demand: retail<br>Supply: healthcare, media, administration | Demand: transportation<br>Supply: education, healthcare, media |
| **2nd place** | Demand: media, administration<br>Supply: transportation, education | Demand: media<br>Supply: media, administration |
| **3rd place** | – | – |

## Graph. Dynamics of digital demand in Moscow




## Graph. Dynamics of digital supply in Moscow[34]




34 Due to the change in the methodology the comparison of figures for media and retail is not possible, the values of 2014 for these dimensions are given for illustrative purpose only

## 4. Kazan

In 2015, Kazan reached fourth place in the ranking, climbing up from eighth place.

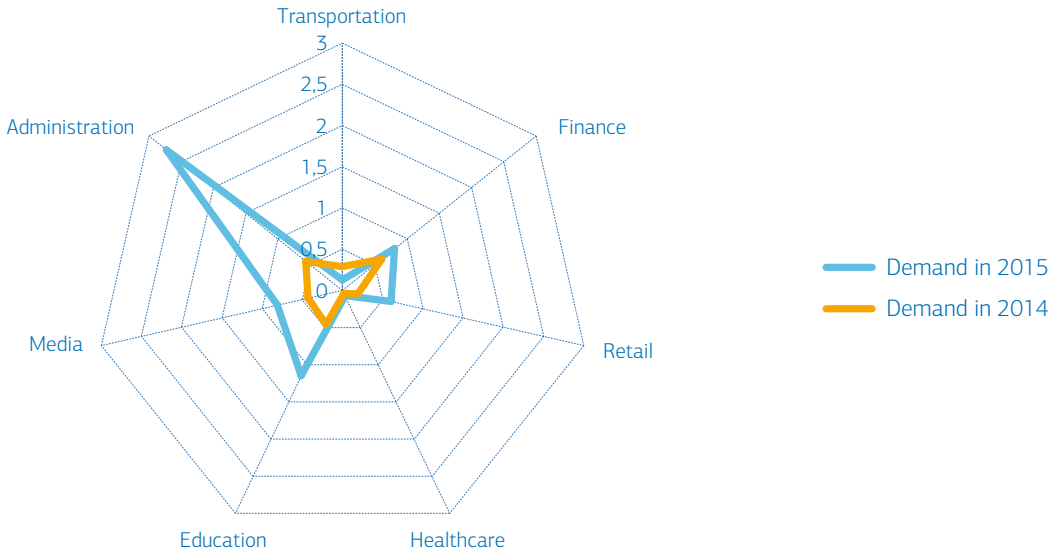
**Demand:** in 2015, there was a sharp increase in demand in the areas of administration (by a factor of five), retail (by a factor of three), and education (by a factor of two) and a slight decrease in demand in the area of transportation.

**Supply:** on the whole, supply was stable, with pronounced growth in the transportation sector and a significant decrease in finance.

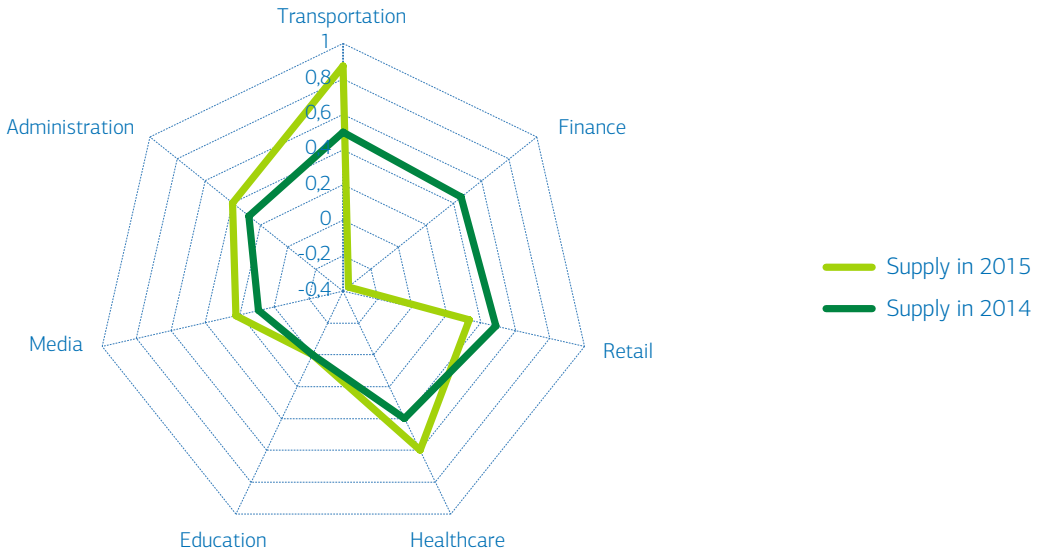
**Correlation:** the correlation coefficient between supply and demand remained moderately negative (-0.24).

| | 2015 | 2014 |
|---|---|---|
| **1st place** | Demand: administration<br>Supply: transportation | – |
| **2nd place** | – | – |
| **3rd place** | Supply and demand: media | – |

## Graph. Dynamics of digital demand in Kazan




## Graph. Dynamics of digital supply in Kazan[35]




35 Due to the change in the methodology the comparison of figures for media and retail is not possible, the values of 2014 for these dimensions are given for illustrative purpose only

## 5. Novosibirsk

Novosibirsk was one of the cities with rapidly developing digitalization. In 2015, it rose from ninth to fifth place in the ranking.

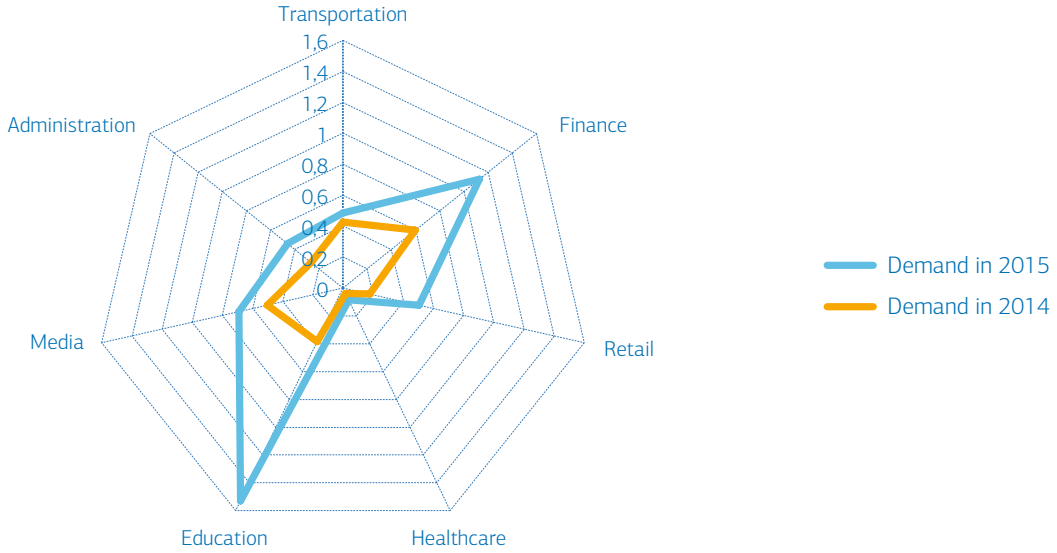
**Demand:** in2015, there was a growth in demand in all dimensions (which caused the overall growth of the city's index), and it was especially rapid in finance and education.

**Supply:** Novosibirsk was one of the cities with dynamic development of supply; supply made a qualitative leap in education and city administration, but decreased slightly in the areas of transportation and finance.

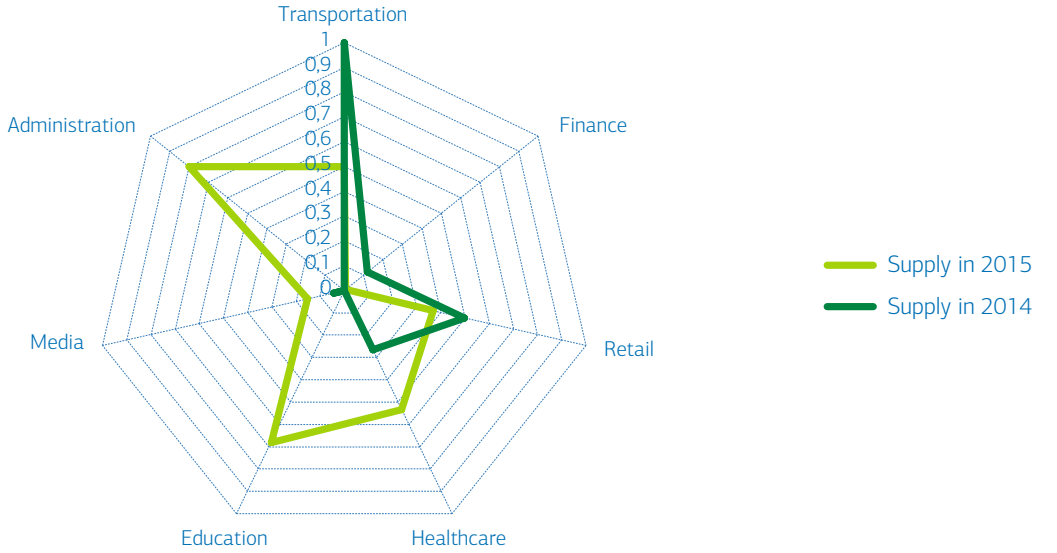
**Correlation:** the correlation coefficient is almost zero (-0.09), which suggests independent development of supply and demand.

| | 2015 | 2014 |
|---|---|---|
| **1st place** | Supply: finance | Supply: transportation |
| **2nd place** | – | – |
| **3rd place** | Supply: education | – |

## Graph. Dynamics of digital demand in Novosibirsk




## Graph. Dynamics of digital supply in Novosibirsk[36]




36 Due to the change in the methodology the comparison of figures for media and retail is not possible, the values of 2014 for these dimensions are given for illustrative purpose only

## 6. Krasnoyarsk

Krasnoyarsk ranked sixth for two years already, while the gap between the first and sixth places in the ranking increased slightly.

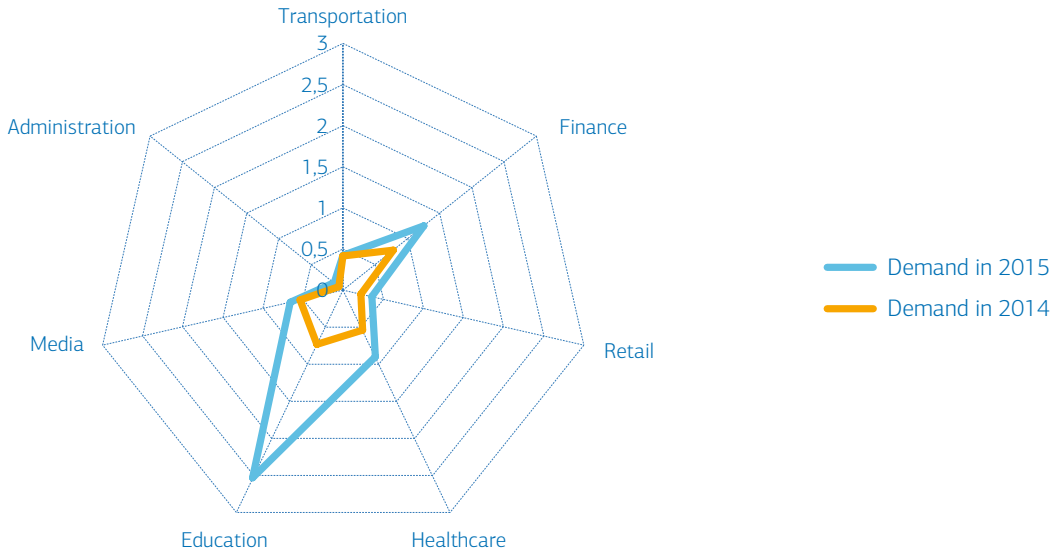
**Demand:** in 2015, demand for education, finance, and healthcare significantly increased, while demand in digital retail and city administration remained low.

**Supply:** on the whole, supply was stable, with slight growth in the administration sector and a significant decrease in finance.

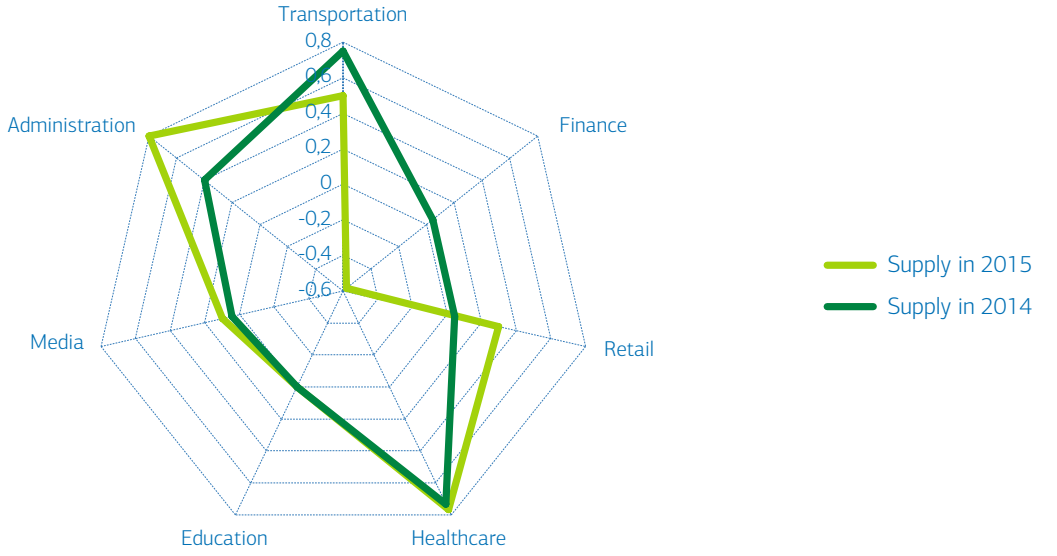
**Correlation:** the negative correlation between supply and demand increased, reaching a significant value (-0.52).

| | 2015 | 2014 |
|---|---|---|
| **1st place** | – | – |
| **2nd place** | – | Demand: healthcare, education |
| **3rd place** | Demand: finance, education | – |

## Graph. Dynamics of digital demand in Krasnoyarsk




## Graph. Dynamics of digital supply in Krasnoyarsk[37]




37 Due to the change in the methodology the comparison of figures for media and retail is not possible, the values of 2014 for these dimensions are given for illustrative purpose only

## 7. Perm

In 2015, the city was only seventh in the ranking due to the weak growth of demand and stagnating supply, although previously it had held fourth place.

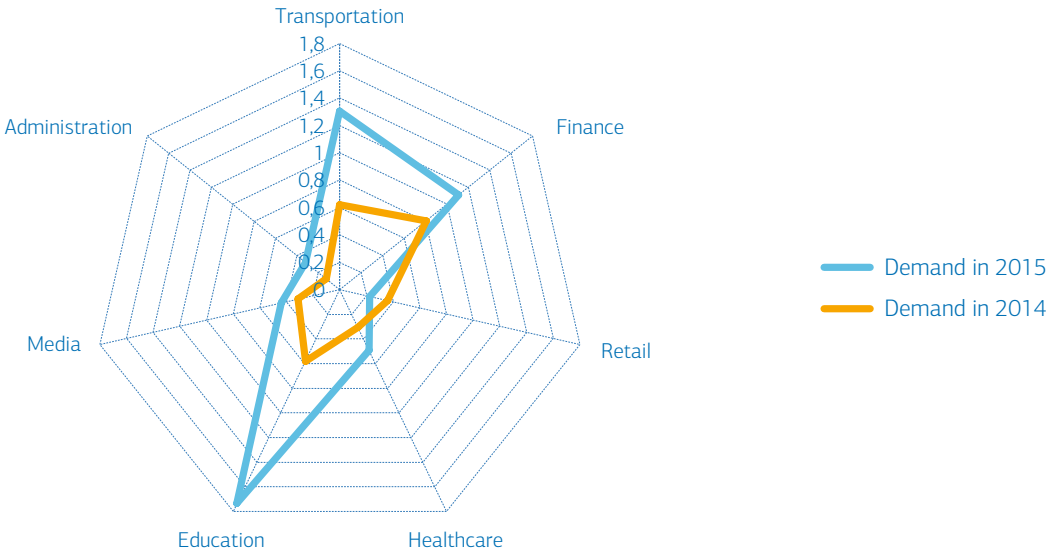
**Demand:** in 2015, demand in transportation, finance and education increased, but not as fast as in the leading cities of the ranking; there was a slight decline in demand in retail.

**Supply:** remained almost unchanged in most dimensions, with a slight increase in administration and decrease in transportation and finance.

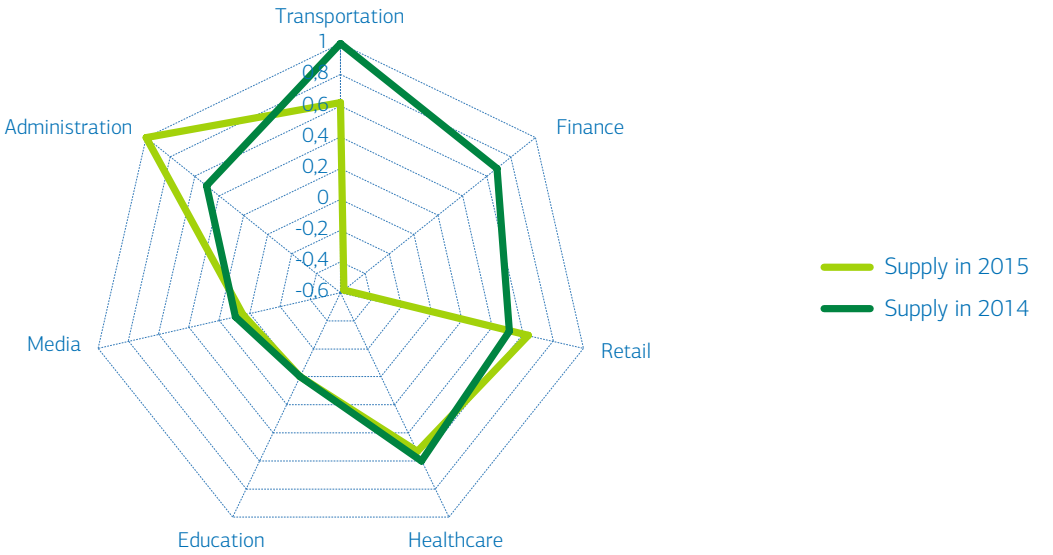
**Correlation:** the weak positive correlation (0.25) observed in 2014 became significantly negative (-0.49).

| | 2015 | 2014 |
|---|---|---|
| **1st place** | Demand: transportation<br>Supply: administration | Supply: transportation |
| **2nd place** | – | – |
| **3rd place** | Supply: transportation | – |

## Graph. Dynamics of digital demand in Perm




## Graph. Dynamics of digital supply in Perm[38]




38 Due to the change in the methodology the comparison of figures for media and retail is not possible, the values of 2014 for these dimensions are given for illustrative purpose only

## 8. Nizhny Novgorod

In 2015, Nizhny Novgorod climbed by two positions in the ranking (from 10th place it held in 2014).

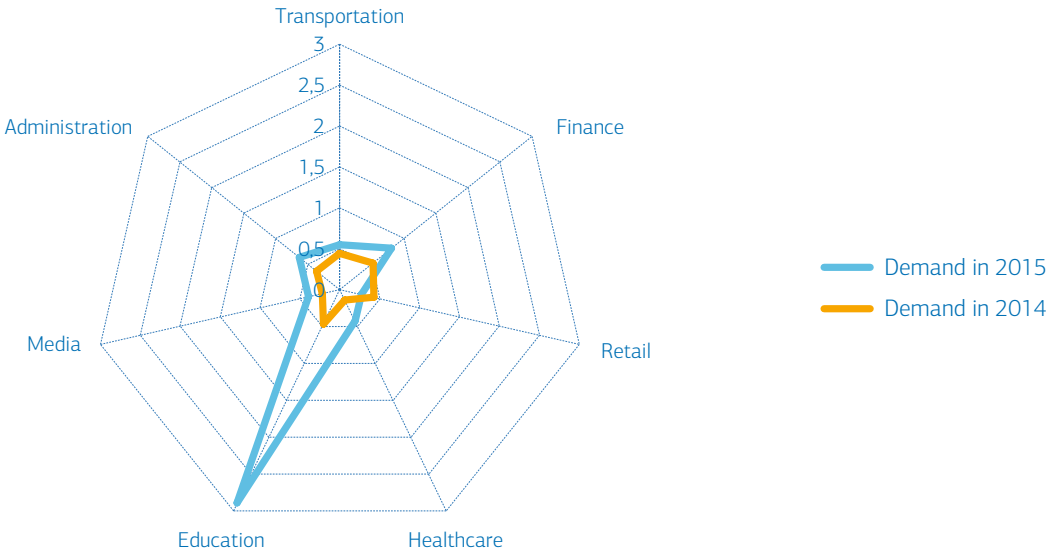
**Demand:** education and healthcare became areas of rapid growth (by factors of six and three, respectively), while demand in all other dimensions remained stable.

**Supply:** supply increased in administration, and decreased in finance.

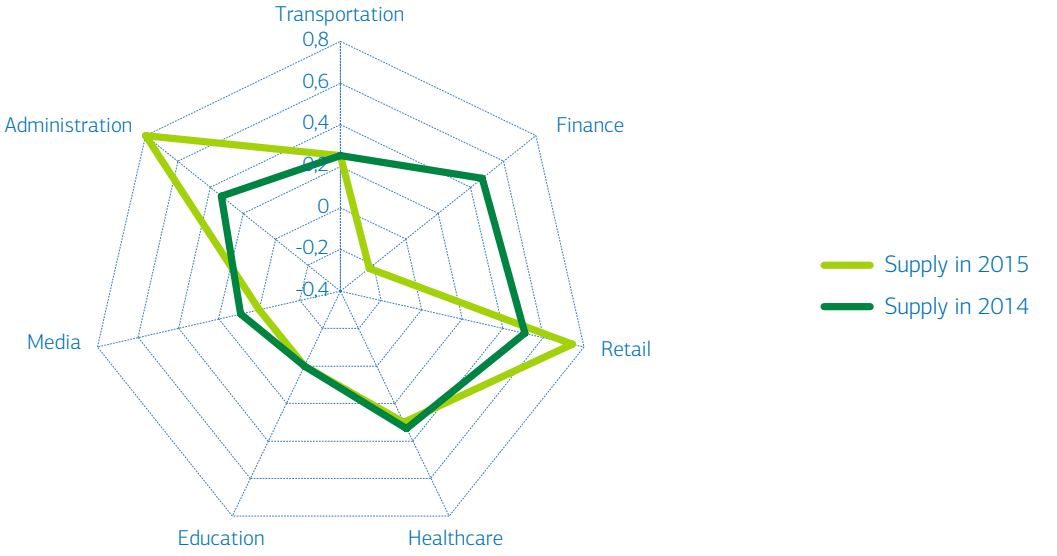
**Correlation:** the weak positive correlation value (0.17) was replaced by a negative one (-0.37).

| | 2015 | 2014 |
|---|---|---|
| **1st place** | – | – |
| **2nd place** | Demand: education<br>Supply: retail | – |
| **3rd place** | Supply: transportation | Demand: retail |

## Graph. Dynamics of digital demand in Nizhny Novgorod




## Graph. Dynamics of digital supply in Nizhny Novgorod[39]




39 Due to the change in the methodology the comparison of figures for media and retail is not possible, the values of 2014 for these dimensions are given for illustrative purpose only

## 9. Ufa

In 2015, Ufa moved two steps higher in the ranking (from the 11th place it held in 2014).

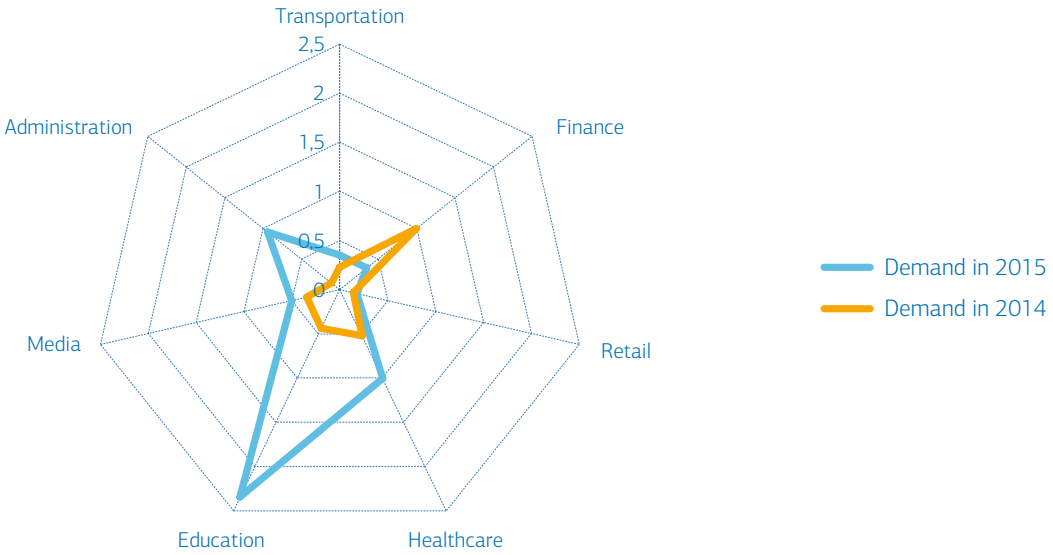
**Demand:** a significant increase in demand in education, healthcare and administration with a decrease in finance (which is quite uncharacteristic of the whole sampling).

**Supply:** a significant change in the structure of supply – an increase in retail and transportation and a decrease in administration and finance.

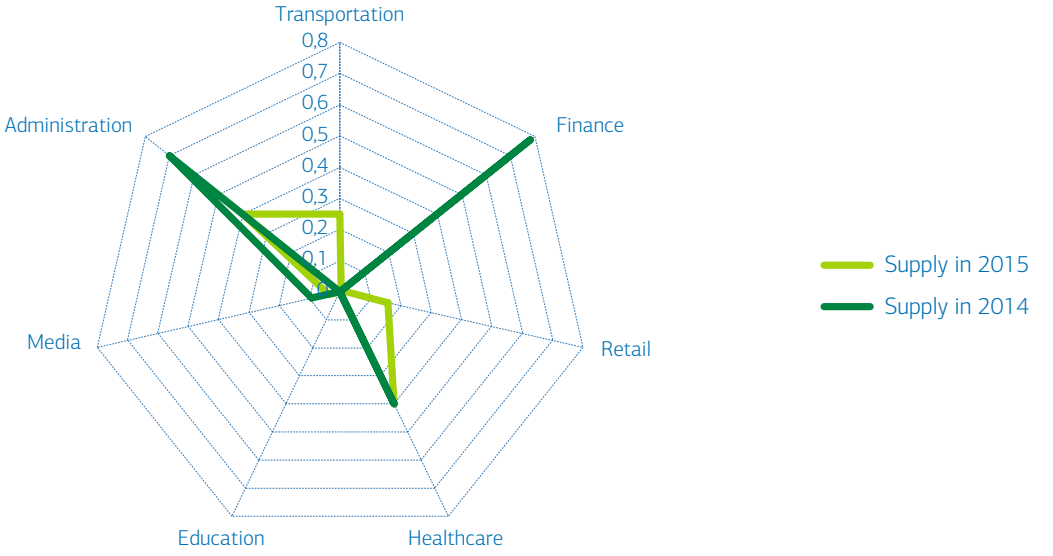
**Correlation:** the positive correlation value (0.49 in 2014) changed to a slightly negative one (-0.13).

| | 2015 | 2014 |
|---|---|---|
| **1st place** | – | – |
| **2nd place** | Supply: finance | Demand: finance |
| **3rd place** | Demand: healthcare, administration | Supply: finance |

## Graph. Dynamics of digital demand in Ufa




## Graph. Dynamics of digital supply in Ufa[40]




40 Due to the change in the methodology the comparison of figures for media and retail is not possible, the values of 2014 for these dimensions are given for illustrative purpose only

## 10. Rostov-on-Don

In 2015, Rostov-on-Don improved its position in the ranking by reaching 10th place.

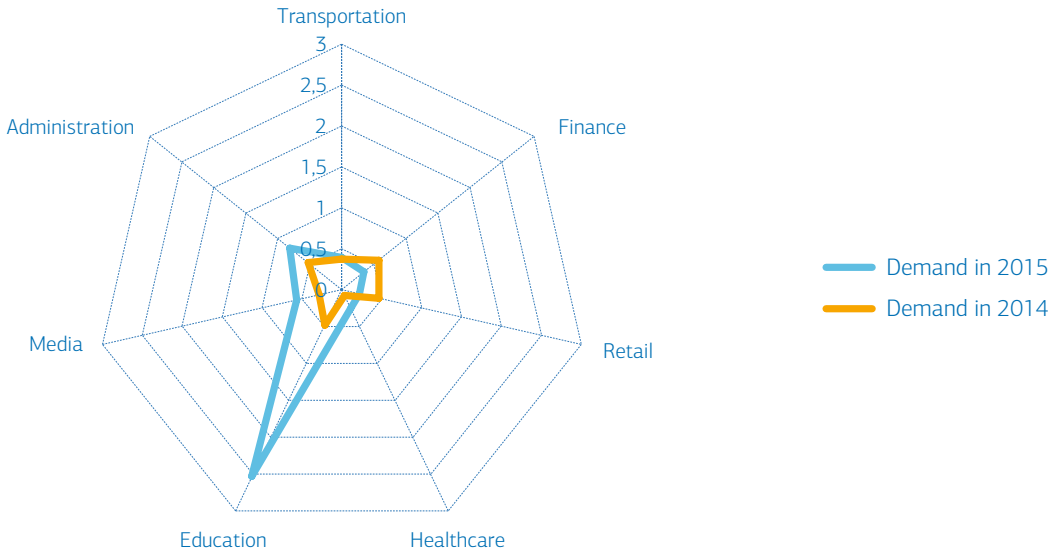
**Demand:** demand significantly grew in education and administration, and decreased in finance and retail.

**Supply:** growth in administration, transportation and healthcare, and a decrease in finance.

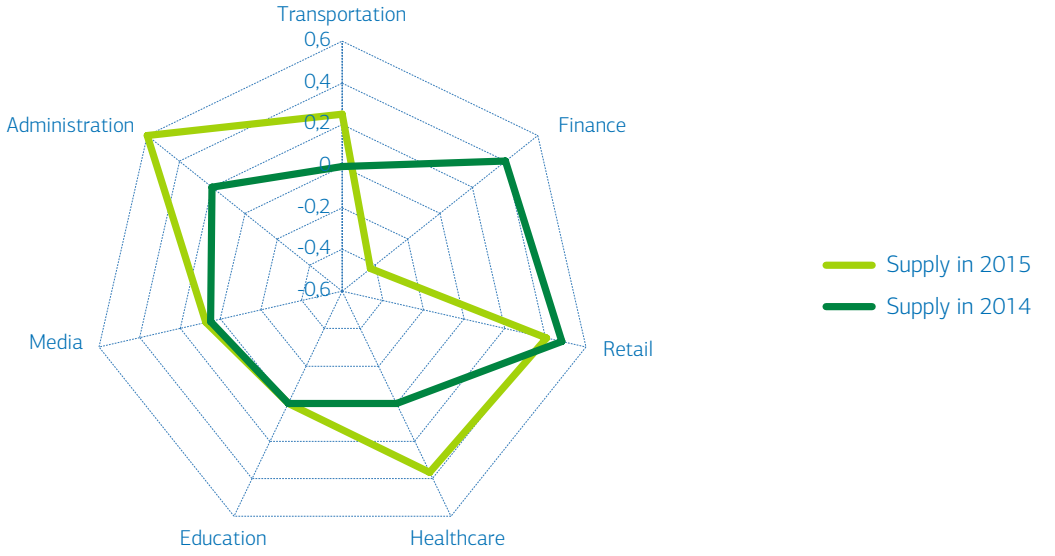
**Correlation:** a distinctly positive correlation value (0.59) was replaced by a weak negative one (-0.16).

| | 2015 | 2014 |
|---|---|---|
| 1st place | – | – |
| 2nd place | – | Demand: retail |
| 3rd place | – | – |

## Graph. Dynamics of digital demand in Rostov-on-Don




## Graph. Dynamics of digital supply in Rostov-on-Don[41]




41 Due to the change in the methodology the comparison of figures for media and retail is not possible, the values of 2014 for these dimensions are given for illustrative purpose only

## 11. Chelyabinsk

In 2015, Chelyabinsk ranked only 11th, having moved down by four places in the ranking.

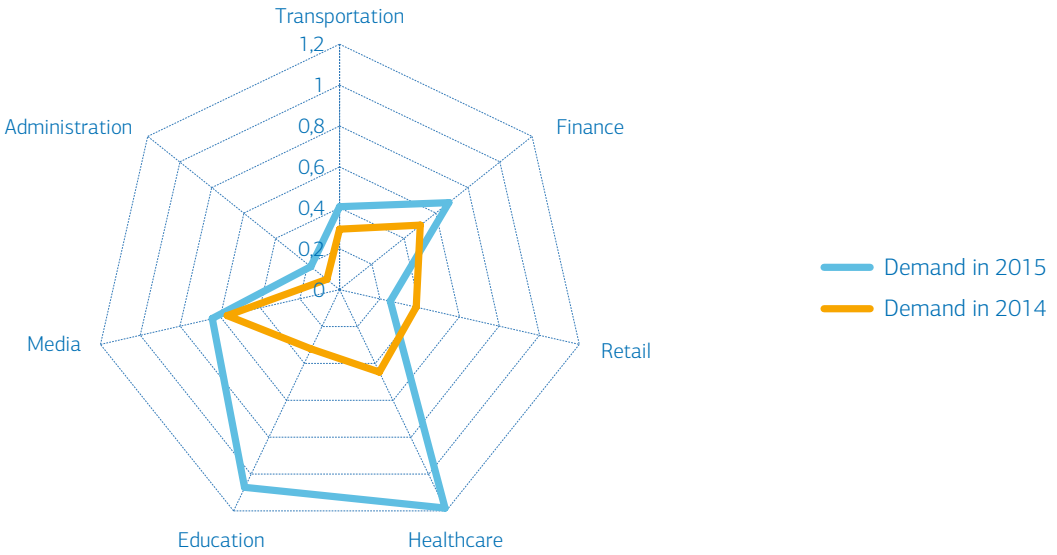
**Demand:** demand increased significantly in the areas of healthcare and education, to a lesser extent—in finance; however, the growth had started at a fairly low level.

**Supply:** supply grew in administration and transportation, while in retail and finance it decreased.

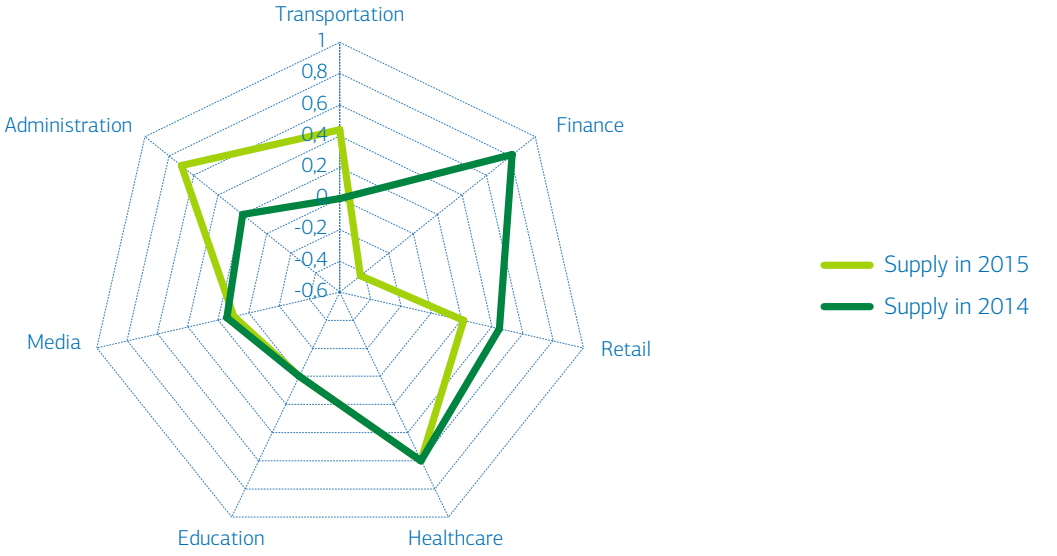
**Correlation:** a pronounced positive correlation value of 2014 (0.48) was replaced by a negative one (-0.12).

| | 2015 | 2014 |
|---|---|---|
| **1st place** | Demand: healthcare | – |
| **2nd place** | – | – |
| **3rd place** | – | Supply and demand: media |

## Graph. Dynamics of digital demand in Chelyabinsk




## Graph. Dynamics of digital supply in Chelyabinsk[42]




42 Due to the change in the methodology the comparison of figures for media and retail is not possible, the values of 2014 for these dimensions are given for illustrative purpose only

## 12. Samara

Samara showed the most dramatic fall in the rankings, moving down from fifth place in 2014 to 12th in 2015, and showing a decrease in demand in a number of dimensions, which was uncharacteristic of the sampling.

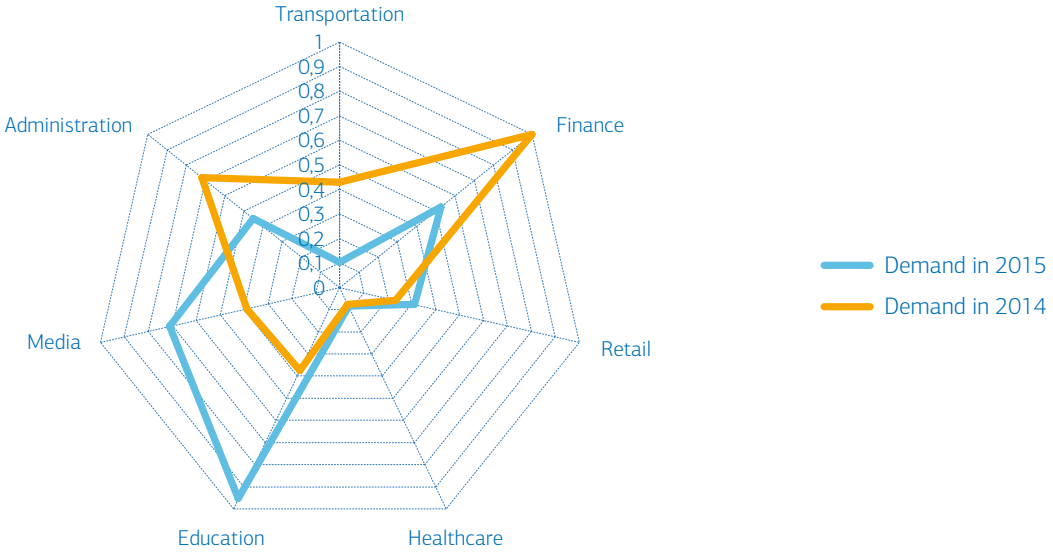
**Demand:** demand increased in the media and education, but declined noticeably in the areas of transportation, finance, and administration.

**Supply:** supply grew slightly in administration and transportation, while in retail and finance it decreased.

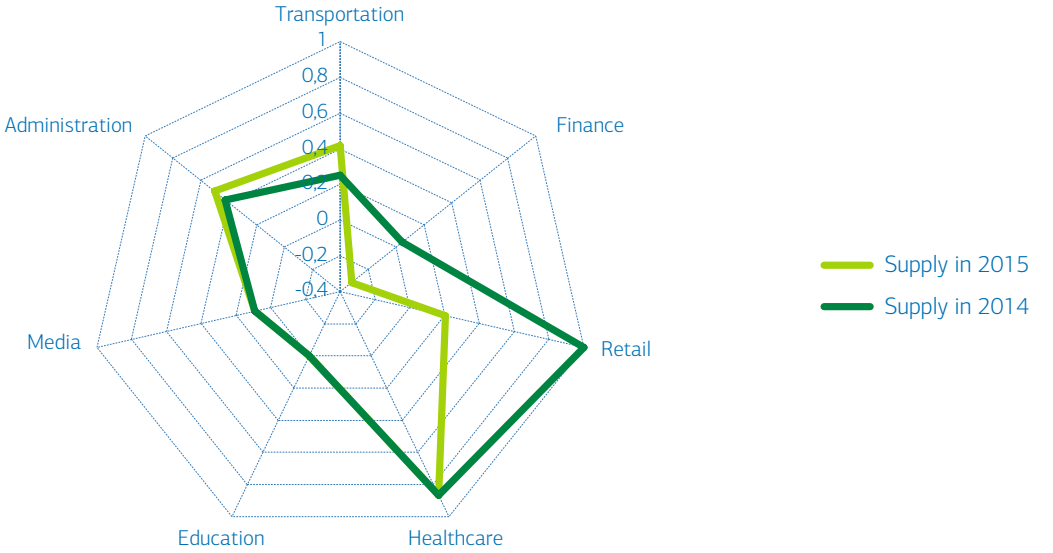
**Correlation:** the distinct negative correlation became even lower in value (a decrease from -0.58 in 2014 to -0.66 in 2015).

| | 2015 | 2014 |
|---|---|---|
| **1st place** | – | Demand: finance<br>Supply: retail |
| **2nd place** | – | – |
| **3rd place** | Supply: healthcare | Demand: administration<br>Supply: healthcare |

## Graph. Dynamics of digital demand in Samara




## Graph. Dynamics of digital supply in Samara[43]




43 Due to the change in the methodology the comparison of figures for media and retail is not possible, the values of 2014 for these dimensions are given for illustrative purpose only

## 13. Omsk

In 2015, Omsk rose by one position, and held 13th place.

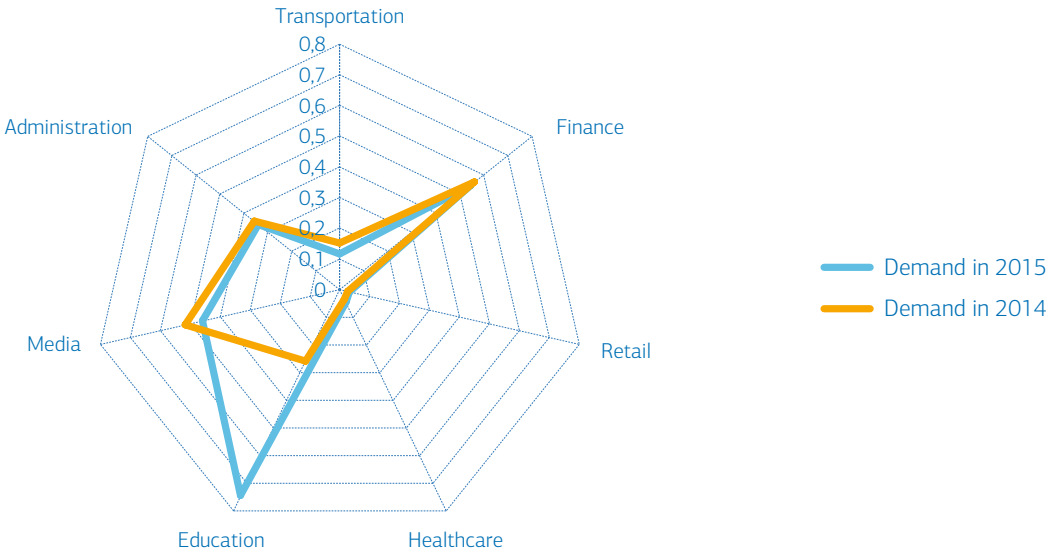
**Demand:** was stable, and grew only in the area of education.

**Supply:** there was an increase in administration and education with a decline in transportation and finance.

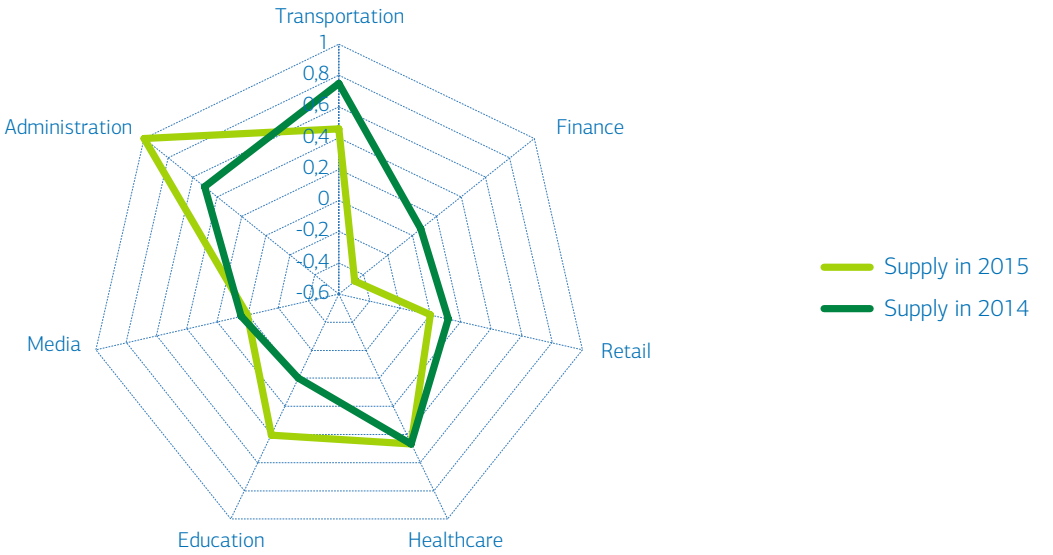
**Correlation:** a pronounced negative correlation value of 2014 (-0.41) slightly improved (-0.19).

| | 2015 | 2014 |
|---|---|---|
| **1st place** | Supply: administration | - |
| **2nd place** | - | - |
| **3rd place** | - | Supply: transportation |

## Graph. Dynamics of digital demand in Omsk




## Graph. Dynamics of digital supply in Omsk[44]




44 Due to the change in the methodology the comparison of figures for media and retail is not possible, the values of 2014 for these dimensions are given for illustrative purpose only

## 14. Volgograd

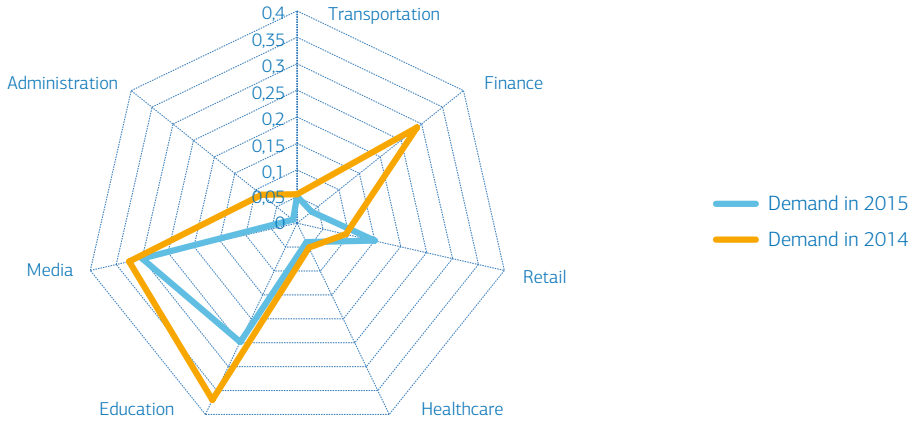
In 2015, Volgograd rose by one position from the last place in the ranking, which it held in 2014.

**Demand:** there was a decrease in demand in finance, administration, and education (the decrease in the latter dimension is very unusual for the sampling); however, a slight increase was observed in retail.

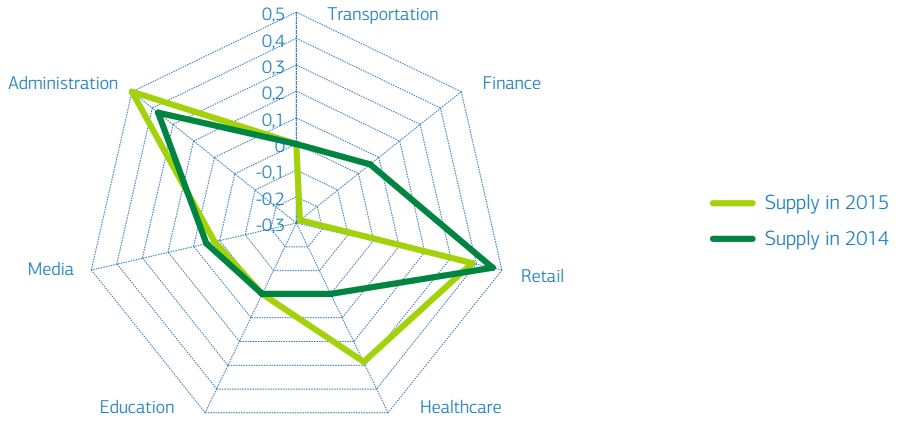
**Supply:** supply grew slightly in healthcare and administration, while in finance it decreased.

**Correlation:** the negative correlation became somewhat less pronounced (-0.2 in 2015 compared with -0.38 in 2014).

**Graph. Dynamics of digital demand in Volgograd**




**Graph. Dynamics of digital supply in Volgograd[45]**




45 Due to the change in the methodology the comparison of figures for media and retail is not possible, the values of 2014 for these dimensions are given for illustrative purpose only

## 15. Voronezh

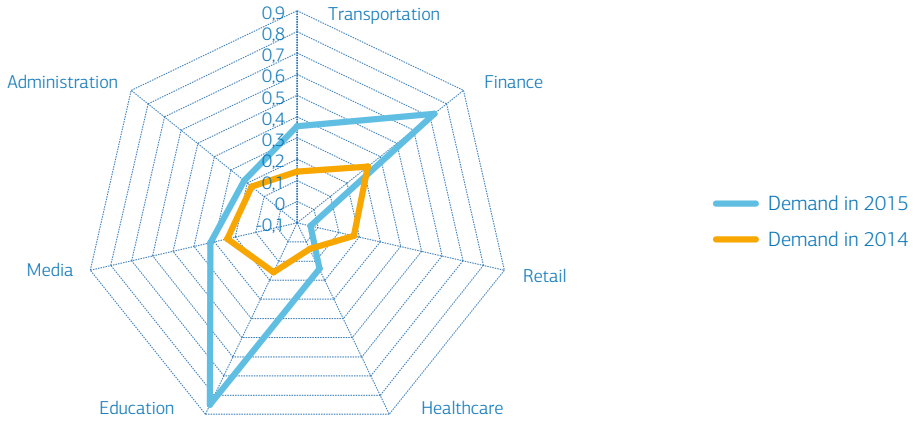
In 2015, Voronezh took the last place in the ranking, dropping by two positions.

**Demand:** there was growth in all dimensions, except for retail, but the values remained very modest compared with those in the other regions.

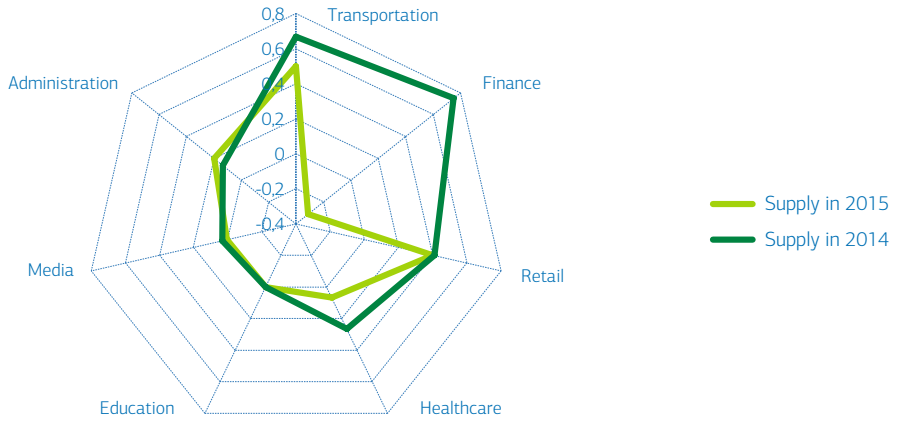
**Supply:** there was a decrease in supply in transportation, finance, and healthcare, and stagnation in all other dimensions.

**Correlation:** the moderate positive correlation value (0.29), observed in 2014, became significantly negative (–0.63).

**Graph. Dynamics of digital demand in Voronezh**




**Graph. Dynamics of digital supply in Voronezh**[46]




46 Due to the change in the methodology the comparison of figures for media and retail is not possible, the values of 2014 for these dimensions are given for illustrative purpose only

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# V. Cases

## Ekaterinburg, transportation: ETransport http://етранспорт.рф/[47]

Navigators of public transport on the basis of GPS/GLONASS satellite monitoring data have become one of the most popular urban digital services in the last 2–3 years. This service enables real-time tracking of the location of public transport vehicles (trams, trolley-buses, buses) and calculating the time of the arrival of the necessary vehicle at a certain stop.

A first successful project in this area was the ETransport startup. It was launched in 2012 by a group of students from Ekaterinburg, headed by Mikhail Avdeev. The history of ETransport started with a free navigator application, which allowed people to find their way at the Urals Polytechnic Institute Spring students festival. At that time, the two largest universities of Ekaterinburg—the Ural State University and the Ural Polytechnic Institute—were united into the Ural Federal University, so many former USU students could not find their way on the territory of former UPI. The navigator was very popular and was installed by about a thousand users.

The ability to track the location of public transport emerged thanks to the widespread installation of GPS and GLONASS in public transport vehicles following the Russian government decree. The mobile application for online monitoring of public transport, designed by Avdeev and his colleagues, quickly gained popularity among the residents of Ekaterinburg: by mid-2014, the number of application downloads had reached 40,000, and more than 5,000 people used it on a daily basis. In early 2014, the project expanded beyond the region—ETransport began to operate in Kazan and St. Petersburg, and became the first application in this segment to enter the Moscow market, getting ahead of Yandex. Transport, its main competitor.

Mikhail Avdeev says, "Neither we nor Yandex could get to Moscow to obtain information for our projects. So we decided to contact Yandex, hoping that by joining forces we would be able to get permission to access the data we needed. However, the representatives of the company refused to cooperate with us... When we launched our project in Moscow, it was an unbelievable success on the very first day! Ten thousand installations in 6 hours!!! And then we got a call from Yandex officials themselves. 'How did you do that?!' they wondered."

In August 2014, there was another breakthrough—ETransport launched its applications in 25 cities simultaneously, from Vladivostok to Kaliningrad, including the millionaire cities (Novosibirsk, Chelyabinsk, and Perm). The company is planning to enter the international market—to launch the franchise in five countries.

ETransport is constantly developing, not only in terms of territorial expansion, but also in respect to functionality enhancement. The programmers teach the application to build routes, to make notifications about public transport vehicles (the alarm clock application for public transit), and to exchange information on traffic with friends. The company is finding way to accommodate the possibility of planning the routes that include subway links – essential for major cities – which is a challenge as no GPS tracking can be used in the case.

In addition, ETransport intends to launch, in Ekaterinburg, an application for the coordination of car drivers in large parking lots, which will allow them to find a free space much faster.

In 2015, the total number of ETransport downloads in Russia was more than 250,000, and figure grew by an average of 3,500 a month. The project was the winner in the MASS-Start category at the Regional Innovation Convent, and was in the top 100 best startups under the IT-START Programme to support young Russians.

47 Sources: http://www.uralstudent.ru/articles/tehnologii/2176723/, http://ekb.dk.ru/news/etransport-zapustilsya-v-25-novyx-gorodax-i-ishhet-investicii-236881565, http://siliconrus.com/2014/04/etransport/, http://f-campus.ru/istoriya-uspexa.html, http://it-eburg.com/text/article/etransport_pokoril_stolicu/

## St. Petersburg, education: Dnevnik (Dairy) www.dnevnik.ru

*Dnevnik* (www.dnevnik.ru), a St. Petersburg educational project, has long gone beyond not only the city, but even the country boundaries, and is a vivid example of how a smart business idea and successful activities on a city scale can reach the federal and even international level.

The idea originated in the early 2000s. In 2001, Gabriel Levi, the company's founder, went to study in the University of Columbia, where he was "positively shocked" by the university's e-documentation management system, where entry to classes, time-tables, home assignments, accounting, and other internal business processes had all been digitised. Later, in 2003, Facebook appeared, which was originally intended to be a closed university network, and Columbia University was one of the first to connect to it. "I thought that the synergy of these two services—the social educational service and the electronic documentation management system for educational institutions—could lead to excellent results," says Levi.

Back in Russia, the young Internet entrepreneur launched a project to create a unified educational network. From 2007 to 2009, research was conducted to study the needs of schools, the basic functionality was determined, and experimental testing of the product was carried out in St. Petersburg Grammar School No. 56.

In 2009, there was a breakthrough—the Expert Council of the St. Petersburg Education Committee approved the decision on the experimental introduction of the service in the city's educational institutions. By the end of the year, 2,000 schools were participating in the project, and by September 2010 the figure increased to 4,000. The Dnevnik platform was used to hold school Olympiad contests.

In 2011, the company began active market expansion. The first target areas were Novosibirsk and the Novgorod Region, where more than 15,000 schools were connected by the end of the year.

The project currently covers more than 60% of all Russian schools, operates in Israel, Hungary, and Ukraine, and is preparing for a launch in China and the United States.

*Dnevnik* has twice won *Premia Runeta*, a national award for Internet projects, and received a prize at the World Summit Award as the winner in the E-Learning & Education category. According to Google Analytics, the project has more than 4 million unique users per month.

*Dnevnik* unites all participants of the market of education services—teachers, pupils, their parents, and government authorities: teachers get access to advanced technologies for the automation of the educational process, tools for online education, and modern methods of communication with parents; parents are able to monitor the learning process, to keep track of homework, to monitor changes in the schedule, etc. Students receive information on schedules, grades, homework assignments, and, in addition, get access to the online library, which allows them to prepare for lessons better. There is also an opportunity to communicate with students from other schools, to create a personal page and tell everyone about their achievements. In addition, dnevnik.ru hosts numerous contests with prizes.

The *Dnevnik* platform is actively used by major Russian and international companies to promote products targeted at schoolchildren and their parents. In particular, in recent years special projects have been implemented to promote brands such as Megafon, Philips, Sony, Kleenex, HP, Lego, Vitrum, Lipton, and Nesquik.

## Moscow, media: Workingmama www.workingmama.ru[48]

Along with broad horizontal Internet portals, there are numerous targeted websites aimed at audiences with demand for a specific set of needs. An example of such is the *Workingmama* portal—a website for working mothers from

48 Sources: http://www.towave.ru/pub/anna-znamenskaya-byt-workingmama-eto-prezhde-vsego-otnoshenie-k-zhizni.html, http://top100.rambler.ru/navi/?theme=574%2F215%2F575&statord=2&range=01.06.2015+-+30.06.2015#

Moscow and St. Petersburg, who have little time to keep track of the necessary, useful and interesting things that a modern city has to offer their children.

The project was created in 2012 by an Internet entrepreneur Anna Znamenskaya. "The idea of *Workingmama*," Anna explains, "appeared solely due to the understanding of current market demands. Working for major portals like Rambler and ivi.ru, I noticed a large number of advertisers who needed mothers as a target audience. The issue of the lack of new sites with the necessary content was raised at the meetings with major advertising agencies representing leading business giants such as, for example, Procter & Gamble. They needed sites targeting successful and active mothers who do not stay at home, but engage in work, hobbies, and continue to develop personally, despite the new status."

The problem was that most of the existing "mum's sites" had been tailored to suit the mothers of very young children, with discussions of things like feeding, vaccinations, nappies, etc. At the same time, the broader portals like *Afisha* or *Bolshoy Gorod* overlooked many of interesting children-related events.

After the concept of the website had been defined, Anna Znamenskaya, together with Natalya Frish, a professional journalist and editor, set about creating its functionality, content, and design. Virtually the entire project was done remotely—on Skype and in Google Docs.

The portal publishes advertisements of children's activities, specially collected information about urban facilities offering services for children (restaurants with children's cuisine, shopping centres with playgrounds, etc.), about children's stores, camps, and other places of recreation. The dedicated Travel section provides recommendations as to what places to go for a vacation with children and contains guides to kids-friendly tourist centres of the world.

Currently, the site is supported by advertising, but Anna Znamenskaya does not rule out that over time the audience will be offered paid services. According to the Rambler Top 100, in 2015 the *Workingmama* website was visited by an average of about 95,000 people per month, and the number of views was around 200,000.

The founders of *Workingmama* have plans to create a mini-social network within the project, as well as to launch a section where business mums will share their success stories, give advice how to effectively combine family and work, as well as tell about their favourite places of interest in Moscow, St. Petersburg, and abroad.

In 2014, the Internet project www.workingmama.ru won *Premia Runeta* (Russian Internet award) in the Science and Education category (http://nom.premiaruneta.ru).

## Rostov-on-Don, administration: rostov-gorod.ru[49]

One of the best Russian city portals is www.rostov-gorod.ru, the official website of the City Council and Administration of Rostov-on-Don. The Rostov portal has repeatedly won its category in Russian Internet contests. In particular, it was awarded the Best Website of a Centre of a Federal Constituent Entity title in 2008 and 2011, won the *GoldenSite* Russian Internet Contest in the category *Official Websites and Media of Territorial Administrative Units* in 2012 and 2013, and in the category Politics and Government in 2011 and 2013.

The www.rostov-gorod.ru portal was created by Mibok, a Rostov Internet agency, in 2000. In 2001, the portal opened an online public office for citizens, which was probably the first one in Russia. The service turned out to be very popular: every year the number of requests sent to the Internet public office increases, on average, by 30%.

In May 2010, the website started the city mayor's blog with the possibility of his interactive communication with users. In general, it should be noted that feedback is one of the strengths of the site. In 2012, an original convenient service was developed under

49 Source: http://www.myshared.ru/slide/237647/

the name City Improvement, which includes a graphic display of citizens' requests on an electronic map of the city. The service makes it possible to link urgent problems requiring immediate solution, e.g. breaches in roads (potholes, markings, signs) or utilities (pipe breaks, water, heat, and electricity supply), illegal waste dumps, non-functioning storm sewers, etc., to specific places. Icons *Done, Pending, Expired, and Under Special Monitoring* are displayed on the map depending on the status of the request. Today, such functionality is becoming almost standard for websites of city administrations, but the Rostov project was among the pioneers in this approach.

The portal regularly hosts interactive voting and various contests with prizes (in particular, a contest for the best panoramic photo of the city), and it also has a forum. Since 2008, the *Portal of Services* section has been available on the website with the approved standards for municipal and transferred public services.

2014 saw the launch of the service *Proactive Rostov-on-Don Citizen* service, where residents can express their views, make suggestions, and put forward initiatives regarding the improvement of life in the city.

Among the other interesting services offered on the portal, a prominent feature is a virtual tour of the city, created on the basis of 360-degree panoramic images made from the top of high-rise buildings, towers, and from helicopters.

## Omsk, media: Omsk Region on the Map – omskmap.ru[50]

The purpose of the website is to reduce the number of “white spots” on the map of Omsk Region and promote the study of local history and the development of tourism in the region.

The Internet project *Omsk Region on the Map* was implemented by the Union of Omsk Webmasters, a regional public organisation, using the funds granted by the Governor of the Omsk Region. Enthusiastic amateur local history experts and tourists of Omsk Region create new spots on the map and fill them with local history, tourist, and other useful information. Now the project boasts of information about almost 700 sites with detailed description, panoramic photos, videos, and maps for many of them.

Omsk Region on the Map (www.omskmap.ru) won the first place at the *Positive Content 2010* Russian competition in one of the main categories *Internet Communities (Forums, LiveJournal Groups, Special Interest Clubs.*

## Voronezh, retail: Pugovitsa (Button) http://pugovit.su/[51]

*Pugovitsa*, a Voronezh Internet project, is a service for the delivery of sets of products for cooking a dinner. The name of the service, which has nothing to do with gastronomy, is explained by its slogan "Cooking dinner with us is as easy as sewing on a button". All food packages include photo recipes, which show all the stages of cooking dishes clearly and in detail.

Similar services had already been launched in Moscow and St. Petersburg (http://domavkusnee.ru/, https://www.facebook.com/kumin.foods), but the one in Voronezh became one of the first, or, rather, the very first of the kind in Russian regions.

The idea of this concept is, on the one hand, to make it easier for housewives to cook a delicious dinner, and, on the other hand, not to replace home-cooked food and the cooking process itself with the purchase of ready-made food.

The menu posted on the website is updated every week, and customers can order sets of products and ingredients for three or five dishes. These are mostly restaurant dishes, such as saltimbocca with salad, sea bass with mushrooms and bacon, etc.

The project was launched in 2014 by young entrepreneurs—Viktoria Krivonosova and Anastasia Krivonosova, two sisters from Voronezh.

50 Source: http://gazetazm.ru/?p=4393
51 Sources: http://pugovit.su/, http://downtown.ru/voronezh/food/6561

Victoria says, "We began to develop the project, because we ourselves like good food, appreciate healthy meals, and it is interesting for us to learn something new in the field of cooking.

In addition, there is a game element here: it is practically a culinary construction set. You get a fresh hot dish that you have made yourself; besides, you know what is in it. It is certainly better than fried semi-finished food."

The creators of the project point out the following advantages of the service they offer:

- You needn't rack your brains thinking of what to cook every day.
- You needn't waste time and energy on shopping trips.
- All products are delivered in precisely calculated proportions, so there won't be any extra food left over in the fridge.
- You know exactly what ingredients you add to the dish, and you can adjust the recipe according to your preferences.
- You have a hot meal that has just been cooked, and not delivered to you across the city.

In the first year since its inception, the project received a prestigious award: Pugovitsa won in the category *Best Designed Startup/Service* at the *GoldenSite* Russian Internet Contest.

## Nizhny Novgorod, Healthcare: The Best Doctors in Our City thebestdoctors.ru

*The Best Doctors in Our City* portal (http://thebestdoctors.ru/) was established by R52.RU Internet studio in Nizhny Novgorod in 2013. Originally, it was planned to create a service merely providing information about the best doctors of the city, but subsequent experience showed that it would be a great idea to add the service of making appointments online.

The website features a minimalist design, user-friendly interface, and simplicity, which is mainly due to the specific target audience with a large proportion of senior citizens. It takes users literally 2–3 clicks to find the name of a doctor they need, to find out all necessary information, and make an appointment.

An important feature of the design is large navigation buttons. On the one hand, this is due to the poor eyesight of a large part of the target audience; on the other hand, it was done for the ease of use on small screens of old monitors (which is relevant for many pensioners) and smartphones.

The biggest and probably most interesting feature of the resource is the Expert Council of the website, consisting of leading scientists and practitioners of the region (eight PhDs in Medicine and one candidate of medical sciences). The Expert Council members evaluate the professionalism of the recommended medical specialists. In addition, other doctors' opinions, patients' comments, as well as scientific merits are used as criteria for choosing a doctor to consult.

On the website, there is a manager providing support round the clock, who can make an appointment with a doctor at any time. Users can get consultation either directly on the site, or through social networks VK and Facebook.

The managers of the project receive more than a thousand requests from visitors of the site per year, and appointments with medical specialists are made in about 60% of the requests.

In the long term, it is planned to extend the service beyond Nizhny Novgorod, and begin operating on the federal level. In 2014, the *Best Doctors in Our City* was among the nominees for *Premia Runeta*.

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# Appendix

| Metrics used in the Index | | |
|---|---|---|
| | **Supply** | **Demand** |
| **Transportation** | 1. The number of kinds of public transport in the city, displayed in the form of schedules in Yandex.Transport<br>2. Availability of electronic displays at stops showing public transport traffic<br>3. Availability of local Internet websites with online public transport schedule | 1. Search queries "online public transport timetable" and all possible related combinations in Google and Yandex per month per 1,000 population in the city |
| **Finance** | 1. The number of bank offices, included in the top 10 of the MarksWebb online banks ranking, per 1,000 population* | 1. Search queries "online/Internet/ mobile bank" and all possible related combinations in Google and Yandex per month per 1,000 population in the city |
| **Retail** | 1. The number of points of delivery of e-commerce companies, included in the top 10 of the ruward.ru/ecommerce-index-2015 ranking, per 1,000 population** | 1. Search queries "online store" minus "open/buy/create" and all possible related combinations in Google and Yandex per month per 1,000 population in the city<br>2. Percentage of population making online purchases at least once a month, according to TGI-Russia panel |
| **Healthcare** | 1. Formalised assessment of the functionality of the website, five largest city hospitals in terms of the number of visits, scoring points for each working element on the check-list | 1. Search queries “online visit/appointment/ doctor’s timetable/polyclinic/hospital” and all possible related combinations in Google and Yandex per month per 1,000 population in the city<br>2. Search queries "online chemist's" and all possible related combinations in Google and Yandex per month pe per 1,000 population in the city |
| **Education** | 1. The number of remote courses of local universities on the following platforms: Coursera, Universarium, Lectorium and Uniweb, average per university in the city | 1. Search queries “higher education online”, “university course online” and searches for the names of the four popular MOOC platforms, and all possible related combinations in Google and Yandex per month per 1,000 population in the city |

* According to the Russian law, primary opening of an account requires a personal visit to the bank; for this reason, the presence of bank offices in the region is essential for using digital banking

** Since the Russian Post is known for its unreliability, a significant part of purchases are collected by customers from specialised pick-up points

| Metrics used in the Index | | |
|---|---|---|
| | **Предложение** | **Спрос** |
| **Media** | 1. Citation index of the top five regional media based on http://www.mlg.ru/ratings/regional_media/3745/0/0/2/ | 1. The number of active accounts in social networks VK, OK.RU, Facebook, My World per 1,000 residents of the city |
| **Administration** | 1. Formalised assessment of the functionality of the website of the city administration, scoring points for each working element on the check-list | 1. The audience of the city administration portal as percentage of the city population<br>2. Search queries "city administration", "state services", and all possible related combinations in Google and Yandex per month per 1,000 population in the city |

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# THERE IS ALWAYS AN EMERGING MARKET

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