



Global Conference on Multidisciplinary Research and Innovation

Hosted Online from Berlin, Germany

Date: 2nd October, 2026

Website: <https://econferencia.com>

ANALYSIS OF THE REGIONAL DIFFERENTIATION OF THE INFORMATION SERVICES MARKET

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Abstract

The article analyses the regional differentiation of the market for information and communication services in 2016–2025 on the basis of official statistical data. Cumulative growth coefficients were calculated for fourteen regions and compared with the national average. The study found that only two of the fourteen regions – Tashkent region (13.37-fold) and Tashkent city (8.59-fold) – exceed the national average (6.47-fold), while the remaining twelve regions fall below it. The gap between the highest and lowest values is 5.89-fold, and the coefficient of variation is 55.1%. More than 95% of the output of information services (OKED 63) is concentrated in Tashkent city. The growth of the industry is regionally concentrated, and mechanisms for broadening its geographic base are substantiated.

Keywords: Regional differentiation, information services, concentration, divergence, coefficient of variation, regional IT policy, Tashkent city, digital divide.

INTRODUCTION

The development of the information services industry is presented at the national level as an integrated process, but in practice it proceeds in a highly uneven manner across regions. The reason for this unevenness lies in the nature of the industry:



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knowledge-intensive services emerge where qualified personnel are concentrated, and personnel, in turn, cluster in centres with higher education institutions, large employers and a professional environment.

Such concentration is economically natural and may even be beneficial at an early stage – it makes it possible to pool scarce resources and build a critical mass. In the long run, however, concentration creates two problems. The first is tension in the labour market and rising wages, which erode the cost advantage. The second is the widening of development gaps between regions.

As shown in previous studies, the exports and domestic market of the industry are growing rapidly. The question of which regions drive this growth, and whether it narrows or widens regional disparities, however, remains open. This article seeks to answer this question.

The aim of the study is to quantify the regional differentiation of the market for information and communication services, to identify its dynamics and to substantiate directions for regional policy.

LITERATURE REVIEW

The theoretical foundations of the spatial concentration of economic activity were developed within the new economic geography. In P. Krugman's model, the gap between the core and the periphery is described as a self-reinforcing process: the interaction of economies of scale and transport costs leads to the concentration of production in one location [1].

For knowledge-based industries, the agglomeration mechanism has an additional feature. The three factors described by A. Marshall – a specialised labour market, the supply of intermediate inputs and knowledge spillovers – are regarded in modern literature as the main sources of agglomeration effects [7]. In information services, the first and third of these are decisive.



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In his concept of the creative class, R. Florida argued that the location decisions of highly skilled professionals are determined not only by the availability of jobs but also by the quality of the urban environment [2]. This approach matters for regional policy: personnel cannot be attracted to peripheral regions through tax incentives or infrastructure alone.

The literature on the digital divide examines the regional dimension separately. Reports of the International Telecommunication Union record regional unevenness in digital development as a persistent phenomenon and show that it remains even when infrastructure coverage has been equalised [3]. The reason is that usage levels and skills converge more slowly than infrastructure [4; 8; 9].

The review of the literature concludes that the mechanisms of spatial concentration are well explained in theory, but there is a lack of studies that quantitatively measure differentiation in Uzbekistan's information services market on the basis of long statistical series.

METHODOLOGY

The information base of the study is the official open dataset of the National Statistics Committee of the Republic of Uzbekistan, "Growth rate of services in the field of information and communication" [5]. The data cover 2010–2025 and fourteen regional units. The indicator is expressed as a percentage of the previous year.

The period 2016–2025 was selected for analysis, with 2015 as the base year. The cumulative growth coefficient is calculated as the product of chain indices:

$$K_i = \prod_{t=2016}^{2025} \left(\frac{r_{i,t}}{100} \right) \quad (1)$$



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where $r(i,t)$ is the growth rate in region i in year t . The average annual growth is found using the geometric mean. Regional differentiation is assessed using the coefficient of variation and the differentiation coefficient (the ratio of the maximum to the minimum value).

An important limitation of the study is stated openly: official open data do not provide absolute values of service output by region as a continuous series. The analysis is therefore based on growth rates. This makes it possible to assess the relative dynamics of regions but not to calculate their absolute shares. Data on absolute shares were taken from press releases of the Statistics Committee [6] and are noted separately.

The second limitation relates to the expression of the data in current prices. Since a single inflation rate applies to all regions, deflation does not affect relative comparison and was not performed in this analysis.

RESULTS AND ANALYSIS

The central question of the study is whether the rapid growth of the industry is shared broadly across the country or concentrated in a few regions. To answer it, cumulative growth coefficients were calculated for each region and compared with the national average. The results are presented in Table 1.

Table 1. Cumulative growth of information and communication services by region, 2016-2025

Rank	Region	Cumulative growth, times	Average annual growth, %	Deviation from national average, pp	Group
1	Tashkent region	13.37	29.6	+9.1	Leader
2	Tashkent city	8.59	24.0	+3.5	Leader
3	Samarkand region	6.28	20.2	-0.4	Close to average



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Rank	Region	Cumulative growth, times	Average annual growth, %	Deviation from national average, pp	Group
4	Jizzakh region	5.74	19.1	−1.4	Close to average
5	Khorezm region	5.35	18.3	−2.3	Close to average
6	Navoi region	4.53	16.3	−4.2	Lagging
7	Kashkadarya region	4.12	15.2	−5.3	Lagging
8	Namangan region	3.97	14.8	−5.7	Lagging
9	Republic of Karakalpakstan	3.87	14.5	−6.0	Lagging
10	Andijan region	3.86	14.5	−6.1	Lagging
11	Bukhara region	3.81	14.3	−6.2	Lagging
12	Surkhandarya region	3.50	13.3	−7.2	Lagging
13	Fergana region	2.94	11.4	−9.1	Significantly lagging
14	Syrdarya region	2.27	8.6	−12.0	Significantly lagging
	Republic of Uzbekistan	6.47	20.5	—	—

The analysis of the table yields the central result of the study: only two of the fourteen regions exceed the national average. This is statistically unusual and indicates a strongly skewed distribution – the average is pulled upward by two high values.

In other words, the 6.47-fold growth recorded for the country as a whole reflects not the typical situation of the fourteen regions but the results of two regions. The average for the remaining twelve regions is 4.17-fold, i.e. considerably below the national figure.



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The fact that Tashkent region ranks first, ahead even of Tashkent city, requires a separate explanation. Possible reasons are the low-base effect and the location of data centres, technology parks and production facilities in the areas surrounding the capital. High rents and wages in Tashkent city push companies towards neighbouring areas – a process well known in international practice.

The two regions at the bottom – Fergana and Syrdarya – lag behind the national average by 9.1 and 12.0 percentage points respectively. Syrdarya region's 2.27-fold growth is very low for a ten-year period and, taking inflation into account, may indicate a real decline.

Grouping divided the regions into four categories: leaders (2), close to average (3), lagging (7) and significantly lagging (2). This distribution provides a natural basis for differentiating regional policy.

The shape of this distribution is easier to see when the regions are ranked visually against the national average, as shown in Figure 1.

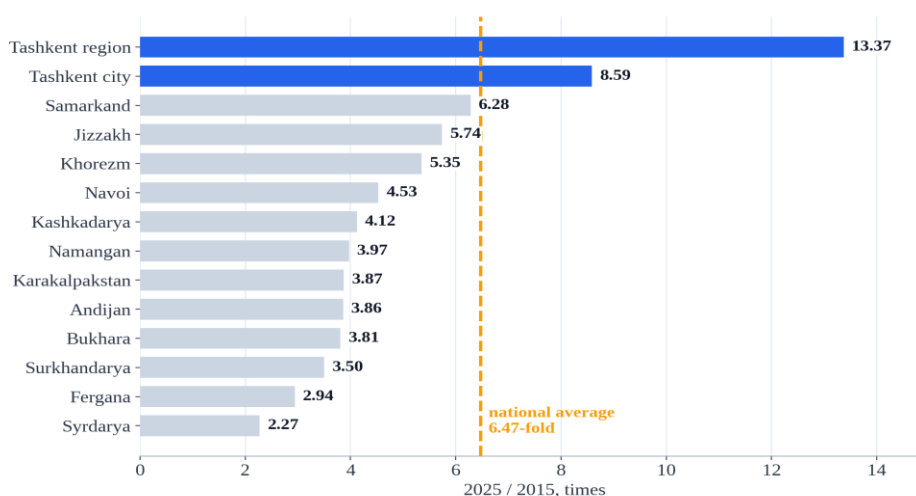


Figure 1. Ranking of regions by cumulative growth of information and communication services, 2016-2025



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The chart clearly shows the shape of the distribution. Two bars stand out sharply at the top, followed by a break, after which the remaining twelve regions are densely packed in the narrow range from 2.27 to 6.28. Such a “bipolar” distribution is the statistical expression of the classic gap between the core and the periphery.

The position of the average line is also noteworthy: it lies to the right of most bars. This means that the arithmetic mean is not an appropriate indicator for describing such a skewed distribution. The median is 4.03-fold and reflects the situation of a typical region much more accurately.

In practical terms, this means that setting industry targets on the basis of the national average would impose unattainable goals on most regions. It is advisable to use the median or group averages in regional programmes.

It is also useful to consider the composition of the groups from a geographic perspective. The leading group consists entirely of the capital agglomeration. The three regions in the close-to-average group – Samarkand, Jizzakh and Khorezm – are located in different parts of the country, i.e. there is no common geographic factor between them. This suggests that their results are explained by local conditions rather than location.

Samarkand region’s third place may be linked to the concentration of higher education institutions: the industry develops faster where a supply of personnel exists. Jizzakh region’s result, in turn, was formed by sharp growth over the last two years (134.3% and 140.6%) and cannot yet be regarded as a stable trend.

To move from a visual impression to a quantitative assessment, the level of differentiation was measured with a set of statistical indicators, presented in Table 2.



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Table 2. Indicators of regional differentiation

Indicator	Value	Interpretation
Highest cumulative growth	13.37 times (Tashkent region)	2.07 times the national average
Lowest cumulative growth	2.27 times (Syrdarya region)	35.1% of the national average
Differentiation coefficient	5.89 times	High gap between regions
Coefficient of variation	55.1%	High unevenness of distribution (above 30%)
Arithmetic mean	5.16 times	Shifted upward by two outliers
Median	4.03 times	Reflects the typical region more accurately
Number of regions above the average	2 (of 14)	Strongly skewed distribution
Tashkent city's share of information services (OKED 63)	More than 95%	The segment is effectively concentrated in one region

The analysis of the table confirms a high level of differentiation. A coefficient of variation of 55.1% indicates high unevenness according to the criteria accepted in economic geography: values above 30% are interpreted as a significant disparity. The most important result is in the last row. More than 95% of the output of the information services segment (OKED 63) falls on Tashkent city. In other words, the segment of the industry with the highest value added is effectively concentrated in a single region, and the remaining thirteen regions hardly participate in it.



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Considered together with the results of previous studies, this leads to an important conclusion. A structural shift has taken place in the industry – from telecommunications to knowledge-intensive services. However, this shift has not been even across regions: telecommunications services are provided in all regions because they are tied to infrastructure, whereas knowledge-intensive services are concentrated in the capital.

As a result, the structural shift automatically widens regional disparities. Whereas the old model covered all regions, the new model is taking shape mainly in a single centre. This poses a serious challenge for regional policy that cannot be solved by relying on overall growth alone.

Cumulative coefficients summarise the whole decade but conceal how the disparities evolved from year to year. The dispersion of regional dynamics over time is therefore shown in Figure 2.

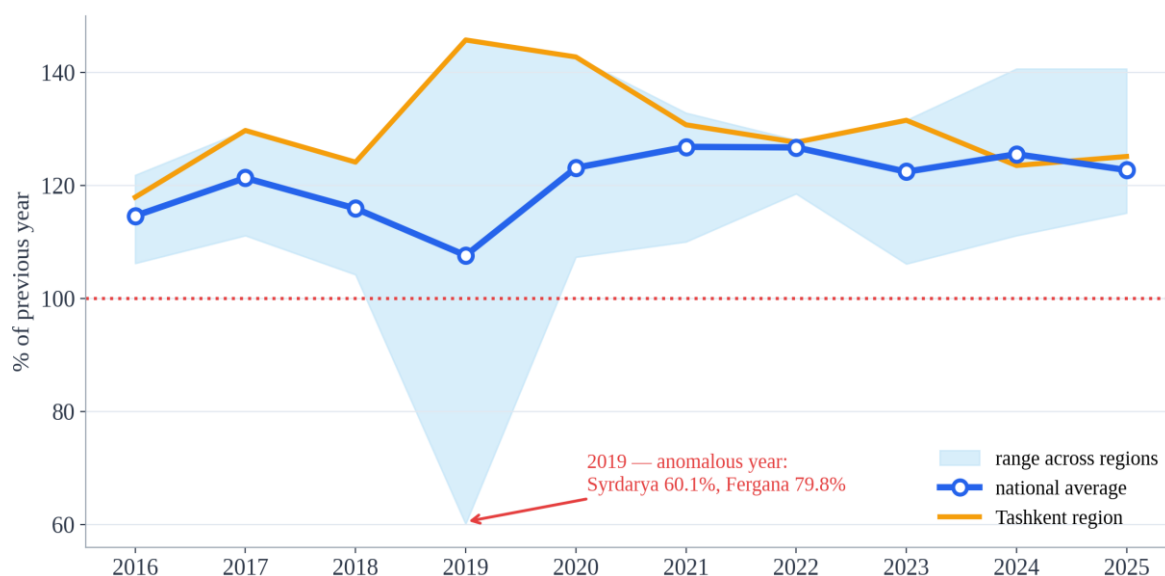


Figure 2. Dispersion of annual growth rates across regions, 2016-2025.



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The shaded area in the chart represents the range between the highest and lowest values across regions. Its width shows how the level of differentiation changed over time: in 2016–2018 the range was relatively narrow, it widened sharply in 2019 and narrowed again in subsequent years, but did not return to its initial level. The sharp widening in 2019 requires particular caution. In that year the indicator was 60.1% in Syrdarya region and 79.8% in Fergana region, i.e. output fell by 39.9% and 20.2% respectively. At the same time, growth of 145.7% was recorded in Tashkent region and 140.8% in Samarkand region.

Such opposite movements within one year are hard to explain by a natural economic process. A possible reason is the organisational restructuring of large operators and the reallocation of revenues between regions, or a change in accounting methodology. This study does not draw a final conclusion on the issue, but the existence of the problem is stated openly, and it requires clarification from the statistical authorities.

Another important feature of the chart is that the Tashkent region line lies above the national average throughout the entire period. This is not a random fluctuation but a stable trend, confirming that the region is moving into a leading position in the industry.

The degree of concentration is ultimately the key policy concern, since it determines how many regions actually benefit from the industry's growth. Its visual expression is given in Figure 3.



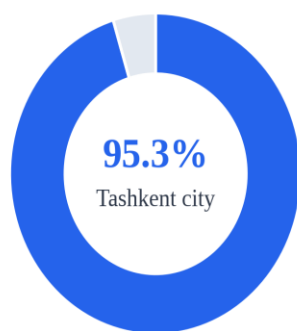
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Regional distribution of information services output (OKED 63)



Distribution of regions by growth rate

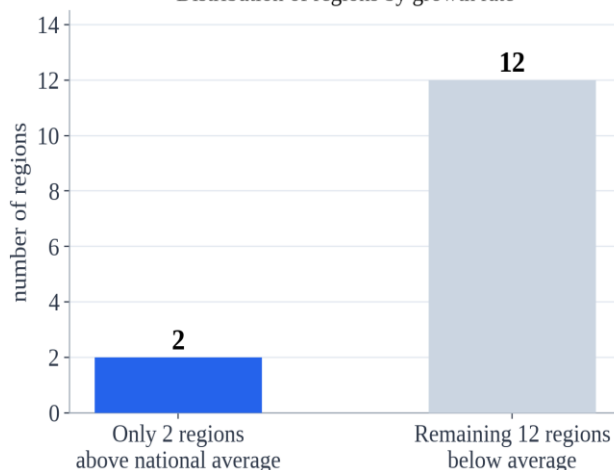


Figure 3. Regional concentration of information services and distribution of regions by growth

The chart in the left panel shows that the segment with the highest value added is concentrated in a single region. Concentration of this degree is rare even in developed countries and represents an acute form of regional development imbalance.

The chart in the right panel shows the skewness of the distribution: only two of the fourteen regions are above the average. Together, these two visuals define the main task of regional policy – broadening the geographic base of the industry.

At the same time, caution is needed in addressing this task. The agglomeration effect is an objective economic regularity that cannot be abolished by administrative means. Attempts to forcibly relocate companies to peripheral regions would reduce their competitiveness, since they would be moved away from their talent pool and professional environment.



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A more realistic approach consists of two directions. The first is strengthening the regional base for training personnel, since companies emerge naturally where specialists are available. The second is supporting the remote work model, in which a specialist lives in a region but works for a company in the capital or abroad. The second direction is particularly realistic in information services, as physical location is not required.

The potential of the remote work model as a regional policy instrument deserves special mention. As substantiated in a previous study, information services are delivered remotely and do not require physical presence. This feature is usually seen as an export opportunity, but it also applies to domestic regional policy.

In practical terms, this means that a company does not have to be established in a region: a specialist can live in their own region and work for an employer in the capital or abroad. This model brings an income flow into the region, which is spent in the local economy. Its only conditions are a stable Internet connection and qualified personnel, both of which can be ensured much more cheaply than locating a company in the region.

Since the regions differ not only in growth rates but also in the nature of their constraints, a single set of measures would not fit all of them. Recommendations for each group of regions are summarised in Table 3.

Table 3. Groups of regions and priority measures

Group	Regions	Description of the situation	Priority measures
Leaders	Tashkent region, Tashkent city	Critical mass achieved; labour market tension has begun	Shift to high value-added segments; productivity programmes to ease wage pressure
Close to average	Samarkand, Jizzakh, Khorezm	Growth rate close to average; base is taking shape	Expanding the training base; developing regional IT centres



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Group	Regions	Description of the situation	Priority measures
Lagging	Navoi, Kashkadarya, Namangan, Karakalpakstan, Andijan, Bukhara, Surkhandarya	Narrow base; mainly the telecommunications segment	Basic digital skills; support for the remote work model
Significantly lagging	Fergana, Syrdarya	Growth may have stalled in real terms	Targeted programme; separate investigation of causes

The analysis of the table shows that the tasks of the groups differ qualitatively. In the leading regions, the problem is not a lack of growth but its quality: tension in the labour market is raising wages and eroding the cost advantage. Their task is to move to high value-added segments.

A different logic applies to the lagging group. Here the industry's base is narrow and consists mainly of telecommunications services. Attempting to attract large IT companies immediately would be ineffective – a talent base must be built first. Mass training in basic digital skills and expanding opportunities for remote work are relatively inexpensive directions that deliver quick results.

For the two significantly lagging regions, the causes must first be identified. Their indicators are so low that they may reflect either a systemic problem or an inconsistency in statistical accounting. In either case, the actual situation must be clarified before measures are developed.

The general methodological conclusion is as follows: a single regional programme for the industry would not be effective. Four different tasks are set for the four groups, and none of them can be transferred to another. This is consistent with the conclusion drawn by segment in previous articles: a differentiated approach is necessary in both dimensions.



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CONCLUSIONS AND RECOMMENDATIONS

First, the analysis of 2016–2025 revealed that only two of the fourteen regions – Tashkent region (13.37-fold) and Tashkent city (8.59-fold) – exceed the national average (6.47-fold). The average for the remaining twelve regions is 4.17-fold.

Second, the differentiation coefficient is 5.89-fold and the coefficient of variation is 55.1%. As the distribution is strongly skewed, the national average does not reflect the situation of a typical region; the median (4.03-fold) is a more accurate indicator.

Third, more than 95% of the output of the segment with the highest value added – information services – falls on Tashkent city. The structural shift in the industry automatically widens regional disparities, since the old model covered all regions, while the new model is taking shape in a single centre.

Fourth, anomalous dispersion of regional indicators was recorded in 2019: output fell by 39.9% in Syrdarya region while rising by 45.7% in Tashkent region. This situation requires a methodological explanation from the statistical authorities.

Fifth, the regions were divided into four groups, and differentiated measures were substantiated for each. In lagging regions, building a talent base and supporting the remote work model are recommended instead of attempting to attract large companies.

Sixth, since the agglomeration effect is an objective regularity, regional policy should focus not on forcibly relocating companies but on expanding the talent base: companies emerge naturally where specialists are available.

In the next study, the competitiveness of information services enterprises will be assessed in practice on the basis of the developed methodology.



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REFERENCES

1. Krugman P. Increasing returns and economic geography // Journal of Political Economy. – 1991. – Vol. 99, No. 3. – P. 483–499.
2. Florida R. The Rise of the Creative Class. – New York: Basic Books, 2002. – 434 p.
3. Measuring the Information Society Report. – Geneva: International Telecommunication Union (ITU), 2018.
4. Digital Economy Report 2019: Value Creation and Capture – Implications for Developing Countries. – Geneva: UNCTAD, 2019. – 194 p.
5. National Statistics Committee of the Republic of Uzbekistan. Growth rate of services in the field of information and communication (1.05.01.0020) (in Uzbek). – URL: <https://stat.uz> (accessed 09.09.2026).
6. National Statistics Committee of the Republic of Uzbekistan. Press releases (in Uzbek). – URL: <https://stat.uz> (accessed 09.09.2026).
7. Marshall A. Principles of Economics. 8th ed. – London: Macmillan, 1920. – 731 p.
8. Baldwin R. The Great Convergence: Information Technology and the New Globalization. – Cambridge, MA: Harvard University Press, 2016. – 344 p.
9. OECD Digital Economy Outlook 2020.– Paris: OECD Publishing, 2020.–314 p.
10. Resolution of the President of the Republic of Uzbekistan No. PQ-5113 of 11 May 2021 “On measures for the accelerated development of the services sector” (in Uzbek) // Lex.uz.
11. Decree of the President of the Republic of Uzbekistan No. PF-6079 of 5 October 2020 “On approval of the Digital Uzbekistan – 2030 Strategy and measures for its effective implementation” (in Uzbek) // Lex.uz.
1. IT Park Uzbekistan. Official data. – URL: <https://it-park.uz> (accessed 09.09.2026).