

THE IMPACT OF THE CONCEPT OF «LISTENING STATE» ON THE SOCIO-ECONOMIC DEVELOPMENT OF THE REGION

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Abstract. The concept of a «Listening State» represents a long-term strategic initiative aimed at improving the quality of life of the population, reducing poverty levels, and enhancing the social status of the most vulnerable segments of society. This study is dedicated to a comprehensive analysis of the implementation of this concept in the context of the city of Turkestan. The aim of the research is to assess the impact of the implementation of the «Listening State» concept, officially adopted in 2019, on the socio-economic potential of Turkestan. To achieve this goal, a mixed-method approach was employed, combining both qualitative and quantitative analyses. In the first stage, a theoretical review of the key principles of the concept was conducted, along with an examination of its various interpretations. In the second stage, an in-depth analysis of the socio-economic situation in Turkestan was carried out, with a focus on the dynamics of change occurring between 2019 and 2023. Based on aggregated statistical data, a mathematical model was developed to reflect the key development trends in the region. The results of the study demonstrated a positive impact of investments in the development of information and communication technologies (ICT), aimed at supporting the implementation mechanisms of the «Listening State». At the same time, certain limitations were identified, related to the insufficient effectiveness of these investments in addressing systemic problems in socially significant sectors. Finally, the study includes an assessment of changes in the socio-economic situation of the population over the past five years, as well as a forecast for the upcoming five-year period.

Kew words: listening state, public administration, socio-economic growth, feedback mechanisms, development strategy.

Аңдатпа. «Халық үніне құлақ асатын мемлекет» тұжырымдамасы – халықтың өмір сүру сапасын жақсартуға, әлеуметтік теңсіздікті азайтуға және қоғамның ең осал топтарының әл-ауқатын арттыруға бағытталған стратегиялық бастама. Бұл зерттеу Түркістан қаласының мысалында аталған тұжырымдаманың тиімділігін жан-жақты талдауға арналған. Зерттеудің мақсаты 2019 жылы қабылданған «Халық үніне құлақ асатын мемлекет» тұжырымдамасының Түркістан қаласының әлеуметтік-экономикалық әлеуетіне ықпалын кешенді түрде бағалау болып табылады. Бұл мақсатқа жету үшін аралас зерттеу әдістемелері қолданылды. Алдымен тұжырымдаманың теориялық негіздері мен оның Қазақстан жағдайындағы ерекшеліктері талданып, одан кейін Түркістан қаласының әлеуметтік-экономикалық жағдайына әсерін тереңдетілген түрінде сараптама жасалды. Зерттеуде статистикалық деректер негізінде математикалық модель әзірленді. Алынған нәтижелерге сәйкес, 2019-2023 жылдар аралығында «Халық үніне құлақ асатын мемлекет» тұжырымдамасын жүзеге асыру үшін ақпараттық-коммуникациялық технологияларға (АКТ) салынған инвестициялардың көлемінің артуына елеулі ықпал еткен. Алайда, әлеуметтік маңызды салалардағы күрделі мәселелерді шешу барысында бұл инвестициялардың тиімділігі шектеулі екені анықталды. Зерттеу нәтижесінде аталған тұжырымдаманың соңғы бес жыл ішінде халықтың әлеуметтік-экономикалық жағдайына тигізген әсері бағаланып, оның даму динамикасы зерделенді, сондай-ақ болашақ бес жылға арналған болжам ұсынылды.

Түйін сөздер: халық үніне құлақ асатын мемлекет, мемлекеттік басқару, әлеуметтік-экономикалық даму, кері байланыс тетіктері, даму стратегиясы.

Аннотация. Концепция «Слышащего государства» представляет собой стратегическую инициативу, направленную на повышение качества жизни населения, снижение социальной неравенства и улучшение благосостояния наиболее уязвимых слоёв общества. Настоящее исследование посвящено всестороннему анализу эффективности реализации данной концепции на примере города Туркестан. Цель исследования

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является комплексная оценка влияния концепции «Слышащего государства», принятой в 2019 году, на социально-экономический потенциал города Туркестан. Для достижения поставленной цели применялись смешанные методы исследования. На первом этапе были проанализированы теоретические основы концепции и особенности её реализации в условиях Казахстана. Далее проведён углублённый анализ влияния концепции на социально-экономическое положение города Туркестан. В рамках исследования на основе статистических данных была разработана математическая модель. Полученные результаты показали, что в период с 2019 по 2023 годы реализация концепции «Слышащего государства» способствовала значительному увеличению объёмов инвестиций в развитие информационно-коммуникационных технологий (ИКТ). В то же время выявлено, что эффективность данных инвестиций в решении системных проблем в социально значимых отраслях остаётся ограниченной. В заключение была проведена оценка влияния концепции на социально-экономическое положение населения за последние пять лет, проанализирована динамика развития и представлен прогноз на предстоящие пять лет.

Ключевые слова: слышащее государство, государственное управление, социально-экономическое развитие, механизмы

Introduction

In order to strengthen the social and economic stability of Kazakhstan and improve its public administration system, the concept of the «Listening State» was first introduced on September 2, 2019, by the President of the Republic of Kazakhstan, Kassym-Jomart Tokayev, through his Address to the People of Kazakhstan, titled *“Constructive public dialogue is the basis for stability and prosperity of Kazakhstan”* [1].

This concept aims to enhance the relationship between society and government by taking into account the opinions and needs of citizens in the decision-making process.

To implement the concept of a «Listening state», the Decree of the President of the Republic of Kazakhstan dated February 26, 2021, № 522 *“On Approval of the Concept of Development of Public Administration in the Republic of Kazakhstan until 2030”* was adopted [2].

The creation of the *“Open Government”* began in 2013 [3]. The Open Government consists of such portals as Open Data, Open Normative Legal Acts, Open Dialog, Open Budgets, and Performance Evaluation of Public Bodies. The Laws *“On access to Information”* dated 15.11.2015 [4], and *“On Informatization”* dated 24.11.2015 were adopted [5].

Furthermore, on May 25, 2020, the Law of the Republic of Kazakhstan №333-VI *«On the procedure for organizing and holding peaceful assemblies in the Republic of Kazakhstan»* was adopted [6].

The next step was the adoption of the Resolution of the Government of the Republic of Kazakhstan *“On the Concept of Development of Civil Society in the Republic of Kazakhstan until 2025”* dated June 2, 2020, № 341 [7].

The concept is deeply connected to the internationally recognized «Good Governance» policy. Both concepts seek to protect the interests of the public, enhance the effectiveness of state management, and improve direct engagement between the government and citizens [1]. The countries such as Finland, Australia and New Zealand demonstrate that the integration of public feedback into state processes fosters higher levels of trust in public institutions and improves governance outcomes. Kazakhstan's initiative to adopt a similar model reflects both the global trend of enhancing citizen engagement and the specific socio-political context of Central Asia [2].

The relevance of this study is determined by the unique socio-economic development characteristics of Turkestan city and its increasing reliance on the effectiveness of public policy. As a major center of historical and cultural heritage, the city's rapid growth necessitates the adoption of governance approaches that ensure sustainable development. In this context, the potential of the «Listening State» concept, aimed at addressing citizens' needs and strengthening public trust, becomes particularly significant.

This study aims to analyze the influence of the «Listening State» concept on the socio-economic development of Turkestan, with a particular focus on changes in the city's living conditions and overall quality of life. By analyzing statistical data, the research aims to evaluate the effectiveness of the concept's implementation and propose actionable recommendations to improve public administration.

Literature review

The principle of the «Listening State» concept in Kazakhstan is underpinned by the values of the «Effective state», «Accountable state», «Professional state», and «Pragmatic state» [1].

Impact of the Concept on National Development

According to Kazakhstani author Sadieva S., the «Listening State» concept reflects the government's capacity to manage the country's affairs effectively, promote economic development, ensure citizens' social security, and provide protection for the vulnerable [8]. In their scientific research, Vasily Kupiyanovsky and Albert Ishumuratov examined the interaction between the authorities and the public through social networks, providing an in-depth analysis of this evolving relationship. They highlighted that the growing use of social media and online platforms is opening new avenues for public dialogue and fostering conditions for equal rights between citizens and authorities [9]. Sadykova Kuralai emphasized that the «Listening State» concept ensures power relations, enhances accessibility and transparency in governance, and facilitates effective control. This framework minimizes the expenditure of state resources while promoting productive government-society relationships through the development of effective citizen participation methods [10]. Talgat Mamaev discussed how ICT opportunities are directly influencing the reduction of corruption and play a key role in realizing the «Listening State» concept in Kazakhstan [11]. Abayev Galymzhan argued that successful dialogue in an effective public administration system requires participants to acknowledge each other's perspectives and engage in good faith [12].

International Perspectives on «Good Governance»

Several international scholars have conducted extensive research on the concept of «Good Governance». Michael Johnston defined «Good Governance» as the effective management of a country's resources in an open, transparent, accountable, and fair manner, always considering the needs of the people [13]. B.Guy Peters and Carmine Bianchi further refined this definition, stating that «Good Governance» refers to the exercise of power in various institutional contexts, with the goal of guiding, controlling, and regulating activities in the interest of the people as citizens, voters, and workers [14]. Abdulai Emmanuel Saffa noted that governance is most effective when decisions and actions by the government are based on consent, legitimacy, and accountability [15]. Leontiev Lucia and Amarasinghe Punsara discussed the concept of «Good Governance» as a contemporary paradigm in public administration, wherein both local and higher authorities must implement policies at national and local levels [16]. Thompson William R. and Volgy Thomas J. argued that achieving a successful life in society is nearly impossible without «Good Governance» which promotes a thriving civilization and efficient delegation of authority. Since no single individual can solve all societal issues alone, leaders require the support of the people to address administrative challenges [17].

Examples from countries with high quality of life indicators (table 1), such as Finland, Australia, and New Zealand, confirms the importance of adhering to the principles of «Good governance»:

Table 1. Comparative analysis of «Good governance» implementation in foreign countries

Country	Implementation of Good Governance Principles	Socio-Economic Outcomes
Finland	Ensures judicial independence, transparency, accountability, and strong rule of law, fostering institutional trust and policy stability.	Achieves high living standards supported by comprehensive social security, advanced healthcare, and quality education systems.
Australia	Maintains stable democratic governance with emphasis on human rights protection, open government policies, and effective resource management.	Demonstrates sustained economic growth through prudent natural resource management, infrastructure development, and equitable income distribution.

New Zealand	Implements parliamentary democracy with robust citizen participation, digital governance, and stringent transparency mechanisms.	Promotes sustainable economic development driven by innovation, social equity, and inclusive welfare policies reducing socioeconomic disparities.
Source: Created by the author using by literature [18].		

The analysis indicates that Finland, Australia, and New Zealand demonstrate a high level of implementation of «Good Governance» principles. These countries serve as exemplary models for other states striving to adopt advanced governance principles. Given the successful implementation of «Good Governance» in developed countries, Kazakhstan is also taking steps toward adopting a similar model based on the «Listening State» concept.

Effective implementation of this approach requires a systematic analysis of key factors influencing governance processes and the development of mechanisms to enhance the efficiency of decision-making.

According to both foreign and domestic scientists, the concept of a «Listening State» plays a crucial role in fostering mutual understanding and trust between the state and its citizens. International researchers argue that the principles of «Good Governance» including transparency, accountability, and respect for citizens' rights, contribute significantly to economic growth. These governance practices enhance national development and social welfare, ultimately improving citizens' quality of life.

Domestic scientists also support this concept, emphasizing the importance of transparency in governance, active citizen participation, and effective feedback mechanisms. They highlight the continuous monitoring of social protection, economic development, and poverty reduction as essential tasks for the state.

Based on the conducted theoretical analysis, we have formulated and validated the following hypotheses:

Hypothesis 1 – The effective implementation of the «Listening State» concept adopted in Kazakhstan will improve the quality of life for the population of Turkistan city and enhance their socio-economic conditions.

Materials and methods
To achieve the research objective, a mixed-methods approach was used to develop practical recommendations for building an effective state based on the

«Listening State» concept, combining theoretical analysis with empirical evaluation.

An analysis of statistical data from 2019 to 2023 was conducted to assess Turkistan's socio-economic potential, leading to the development of a mathematical model to test the study's hypotheses. Descriptive statistics were first used to visualize key patterns and identify variables as either parametric or nonparametric. [19].

The next step was Pearson's r correlation analysis, a statistical method measuring the strength and direction of linear relationships between variables, with coefficients ranging from -1 to 1:

- A coefficient of ($r = 1$) indicates a perfect positive correlation.
- A coefficient of ($r = -1$) indicates a perfect negative correlation.
- A coefficient of ($r = 0$) suggests no correlation.

In this context, the p -value is crucial for assessing the statistical significance of the correlation coefficient [20].

Pearson's correlation formula:

$$r = \frac{n \sum(xy) - \sum x \sum y}{\sqrt{[n \sum x^2 - (\sum x)^2][n \sum y^2 - (\sum y)^2]}} \quad (1)$$

Where:

- r - Pearson correlation coefficient;
- n - number of observations;
- $\sum x$ - the sum of all values of the variable x ;
- $\sum y$ - the sum of all values of the variable y ;
- $\sum(xy)$ - the sum of the products of the corresponding values of the variables x and y ;
- $\sum x^2$ - the sum of the squares of the variable values x ;
- $\sum y^2$ - the sum of the squares of the variable values y .

Bayesian Linear Regression (BLR) was then conducted using a dependent variable (Y_1) and multiple independent variables (X_1, X_2, \dots, X_n). This method examines linear and causal relationships and

tests hypotheses. The key measure, R^2 , indicates the proportion of variance explained, with values closer to 1 showing a better model fit [21].

$$y = X\beta + \epsilon \quad (2)$$

Where:

- y - vector of observed values,
- X - the matrix of features (or predictors),
- β - vector of coefficients of the model,
- ϵ - vector of random errors.

To facilitate future predictions, Bayesian State Space Models were developed. This approach uses parameters to determine probabilities in estimation and forecasting. A key feature of this method is its capacity to update forecasts (Posterior: R^2 , Harvey's goodness of fit) by incorporating new predictive data from prior information [22].

Finally, predictive analytics was employed to assess the likelihood of future outcomes based on historical data. These indicators are critical for evaluating the effectiveness of a model in forecasting future trends. Data quality, model selection, and precise calibration and testing are crucial to

ensuring model efficacy. The R^2 values hold particular significance in the analysis, as they measure how well the changes in the data correspond to positive or negative outcomes over time. The closer R^2 is to (1), the better the model's fit to the data [23]. These studies collectively assessed the validity of the hypothesis that the «Listening State» system in the country improves socio-economic conditions. For data processing, we utilized the JASP software package.

Results

In accordance with the Law of the Republic of Kazakhstan, January 1, 2017, titled «On the order of consideration of appeals of individuals and legal entities» [24], the Akimat (City Hall) of Turkestan City utilized several special forms of communication with the public from 2019 to 2023. These included single contact centers, specifically «1310» and «109», which were established as part of a pilot project implementing the «One window» principle through the unified communication system «E-appeals» [25].

ICT expenditures in Turkestan have increased, particularly in software and employee training, reflecting its growing role in governance and development (table 2).

Table 2. Total Expenditure on Information and Communication Technologies (ICT) in Turkestan City Considering Public Administration Organization (years 2019–2023)

ICT Expenditures	Years				
	2019	2020	2021	2022	2023
Total	3 236,7	5 184,9	4 446,5	4 204,9	5 255,6
Including:					
Expenditures for purchasing software under licensing agreements	343,4	1 489,5	657,6	399,2	641,8
Expenditures for in-house software development	5,7	0,9	2,6	0,4	1,0
Expenditures on employee training related to the development and use of ICT	17,5	6,4	9,3	19,2	19,5
Including expenditures on digital skills training	-	-	-	1,7	0,3
Expenditures for services provided by organizations and specialists related to information technology (excluding communication and training services)	1 226,0	1 542,7	1 071,9	822,7	1 109,8
Source: Based on information obtained from the Stat.gov.kz website, compiled by the author [26]					

For the analysis, the primary factors affecting the quality of life of the local population in Turkestan were identified and evaluated.

For the statistical analysis, the dependent variable $Y1$ was identified, and

independent variables ranging from $X1$ to $X11$ were selected as influencing factors. These variables encompass data from the last five years, specifically from 2019 to 2023.

Table 3. Variables for analysis (years 2019–2023)

Variables	2019	2020	2021	2022	2023
Dependent variables:					
Y1 - Total expenses for information and communication technologies in the city of Turkestan (taking into account the organization of Public Administration)	3,236.7	5,184.9	4,446.5	4,204.9	5,255.6
Independent variables:					
X1 - Population of Turkestan (at the end of 2023)	210258	211257	212928	220159	228003
X2 - Life Expectancy of the Population of Turkestan	69	67	67	74	74
X3 - Average Monthly Salary of the Population of Turkestan	123 853	158 762	195 302	237 189	278 894
X4 - Gross Regional Product per Capita in the City of Turkestan	1008	1174	1363	1671	1988
X5 - The Digital Literacy Levels of the Population in Turkestan	85.8	86.5	87.2	89.9	93.0
X6 - The Unemployment Rate in the City of Turkestan	5.6	4.9	5.7	5.9	5.2
X7 - Migration in the City of Turkestan	2784	3589	2,557	5,362	1,226
X8 - The number of organizations, enterprises, and industries in the city of Turkestan	1782	1906	2057	2303	2535
X9 - Satisfaction of the population with the authorities' activities in ensuring the needs of citizens	65.0	55.0	53.0	66.0	67.0
X10 - Investments in fixed assets in areas of use	443 503	705 722	659 114	742 588	948 810
X11 - Inflation rate	6,9	7,8	9,0	17,1	11,1
Source: created by the author based on data from the website stat.gov.kz [26]					

At the initial stage of the analysis, descriptive statistics were employed to provide a comprehensive overview of the data.

Table 4. Descriptive Statistics

Descriptive Statistics							
	Valid	Mean	Std. Deviation	Shapiro-Wilk (W)	P-value Shapiro - Wilk	Minimum	Maximum
Y1	5	4.465	0.825	0.916	0.504	3.236	5.255
X1	5	216521.000	7498.598	0.864	0.244	210258.000	228003.000
X2	5	70.200	3.564	0.792	0.069	67.000	74.000
X3	5	198800.000	61483.930	0.984	0.954	123853.000	278894.000
X4	5	1440.800	392.737	0.964	0.837	1008.000	1988.000
X5	5	88.480	2.966	0.893	0.373	85.800	93.000
X6	5	5.460	0.404	0.946	0.708	4.900	5.900
X7	5	1276.429	1766.724	0.748	0.028	1.226	3589.000
X8	5	2116.600	304.000	0.962	0.821	1782.000	2535.000
X9	5	699947.400	181118.233	0.966	0.848	443503.000	948810.000
X10	5	61.200	6.648	0.809	0.096	53.000	67.000

X11	5	10.400	4.064	0.869	0.261	6.900	17.100
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Source: the analysis was made by the author using the JASP program

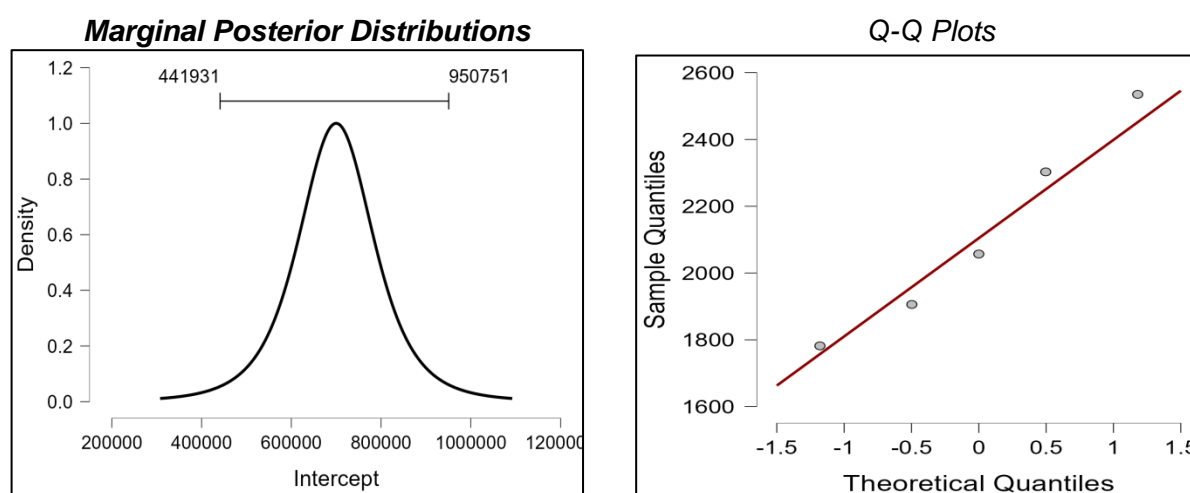
Shapiro-Wilk Test: This test evaluates whether the data is normally distributed. For most variables in the table, the Shapiro-Wilk (W) values indicate normality, as the *p-values* are greater than 0.05. However, for X7, the *p-value* is 0.028, which suggests a significant deviation from normality. The other variables (X2, X3, X4, etc.) show *p-values* well above the $p > 0.05$ threshold, indicating that their distributions do not significantly differ from a normal distribution.

Descriptive Statistics: The mean values of the variables ($Y1 = 4.465$, $X1 =$

216521.000) provide an average of the observed data points for each variable. The standard deviation ($X1 = 7498.598$, $X5 = 2.966$) indicates the variability or dispersion of the data around the mean. The minimum and maximum values show the range of the data, with X7 having a large spread between 1.226 and 3589.000, reflecting high variability.

Further research will focus on parametric data to apply precise statistical tests and assess relationships using appropriate methods. The analysis was presented as a diagram using apostrophe scattering (Figure 4).

Figure 4. Marginal Posterior Distributions and Q-Q Plots



Note: the analysis was made by the author using the JASP program

The marginal posterior distribution graph exhibits a bell-shaped curve characteristic of a normal distribution, indicating the potential values of the variables and their corresponding ranges [27]. The confidence interval is represented by the boundaries displayed at the top of the graph, covering the range of 441,931 to 950,751. This range reflects the parameters that contain the true value with a 95% probability of confidence. Typically, the center of the distribution, representing the most likely value, is approximately 700,000.

The Q-Q Plots (Quantile-Quantile Plots) graph allows you to assess how well

the selected variables align with a theoretical distribution, such as a normal or exponential distribution. If the points fall along a straight line, this indicates that the selected variables correspond closely to the theoretical distribution. The diagonal red reference line serves as a guide for evaluating this alignment, typically at a 45-degree angle [28]. In our results, the points in the Q-Q Plots graph are positioned along the red reference line, confirming that the variables closely approximate the theoretical distribution with minimal deviations. The next step is to conduct a correlation analysis.

Table 5. Correlation analysis

Pearson's R Correlations												
Variable	Y1	X1	X2	X3	X4	X5	X6	X7	X8	X9	X10	X11
Y1 Pearson's r	—											
p-value	—											
X1 Pearson's r	0.489	—										
p-value	0.403	—										
X2 Pearson's r	0.106	0.873	—									
p-value	0.865	0.053	—									
X3 Pearson's r	0.575	0.950	0.775	—								
p-value	0.310	0.013	0.123	—								
X4 Pearson's r	0.551	0.978	0.817	0.994	—							
p-value	0.336	0.004	0.091	0.001	—							
X5 Pearson's r	0.521	0.999	0.857	0.961	0.985	—						
p-value	0.368	0.001	0.064	0.009	0.002	—						
X6 Pearson's r	-0.675	-0.015	0.268	0.072	0.046	-0.026	—					
p-value	0.211	0.982	0.663	0.908	0.941	0.967	—					
X7 Pearson's r	-0.144	-0.685	-0.588	-0.810	-0.779	-0.695	-0.567	—				
p-value	0.817	0.202	0.297	0.096	0.121	0.193	0.319	—				
X8 Pearson's r	0.541	0.976	0.823	0.995	1.000	0.983	0.061	-0.785	—			
p-value	0.346	0.004	0.087	0.001	0.001	0.003	0.922	0.116	—			
X9 Pearson's r	0.846	0.872	0.592	0.914	0.909	0.891	-0.324	-0.541	0.904	—		
p-value	0.071	0.054	0.293	0.030	0.033	0.043	0.594	0.346	0.035	—		
X10 Pearson's r	-0.257	0.614	0.863	0.392	0.472	0.578	0.246	-0.248	0.476	0.202	—	
p-value	0.676	0.271	0.060	0.514	0.423	0.307	0.690	0.687	0.418	0.745	—	
X11 Pearson's r	0.094	0.596	0.773	0.685	0.663	0.599	0.521	-0.663	0.675	0.474	0.460	—
p-value	0.880	0.289	0.125	0.202	0.222	0.286	0.368	0.223	0.211	0.420	0.436	—

Source: the analysis was made by the author using the JASP program

According to the results of the correlation analysis, several significant relationships were identified between the variables. For example, a strong negative correlation was observed between variables X4, X5, and X8 (Pearson r -0.675, p-value 0.211).

Although the relationship between these variables is not statistically significant, it indicates that an increase in one of these variables tends to result in a decrease in the other two. In other words, the variables X4, X5, and X8 exhibit an inverse relationship.

Table 6. Bayesian Linear Regression – BLR

Model Comparison - Y1					
Models	P(M)	P(M data)	BF _M	BF ₁₀	R ²
X1 + X2 + X4	0.050	0.056	1.127	1.000	0.688
X1 + X2 + X3	0.050	0.056	1.127	1.000	0.689
X3	0.050	0.047	0.932	0.835	0.331
X4	0.050	0.045	0.899	0.806	0.304
X5 + X6 + X7	0.050	0.053	1.070	1.000	0.875
X6 + X7 + X8	0.050	0.053	1.070	1.000	0.866
X5 + X7 + X8	0.050	0.053	1.070	1.000	0.753
X6 + X7	0.033	0.052	1.588	1.460	0.866
X8	0.050	0.042	0.842	0.796	0.293
X6 + X8	0.033	0.041	1.255	1.167	0.797
X9	0.083	0.137	1.750	1.712	0.716
X9 + X11	0.083	0.106	1.300	1.319	0.838
X10	0.083	0.050	0.579	0.623	0.066
X11	0.083	0.047	0.547	0.591	0.009

Source: the analysis was made by the author using the JASP program

The results of R^2 indicated the following values: X_3 (0.331), X_4 (0.304), X_8 (0.293), X_{10} (0.066), and X_{11} (0.009). These values are significantly lower than (1), which suggests a weak relationship between the dependent variable (response Y_1).

The total spending on information and communication technologies in the city of Turkestan (including the organization of Public Administration) has been analyzed over the past five years. The indicators suggest that these investments continue to

have a significant impact on the development of various industries (X_3 , X_4 , X_8 , X_{10} , X_{11}), although they may have a limited effect on addressing the challenges faced by these sectors.

Now it is time for predictive analysis. In other words, the Bayesian State Space Models were examined to assess how much the situation will change if the problem areas identified in previous analyses are adjusted through state intervention and development measures.

Table 7. Bayesian State Space Models

<i>Model Summary</i>			
Residual SD	Prediction SD	R^2	Harvey's goodness of fit
87768.154	122092.115	0.765	0.928

Source: the analysis was made by the author using the JASP program

According to the results of the analysis:

The standard deviation (SD) of the residual values is 87,768.15.

The standard deviation (SD) of the predicted values is 122,092.115.

The value of R^2 (coefficient of determination) is 0.765. A value of R^2 close to (1) indicates that the model effectively describes the data. Therefore, a value of 0.765 is considered very good.

Harvey's goodness of fit yielded a value of 0.928. A value close to (1) indicates

an excellent match between the model and the observational data. The value of 0.928 signifies a very high level of agreement with the model.

In summary, the results of the Bayesian State Space Models are of high quality, as evidenced by an R^2 value of 0.765 and Harvey's goodness-of-fit score of 0.928. In other words, preliminary forecasts indicate that this model is effective for analyzing precipitation. Next, the method of predictive analytics was developed.

Table 8. Predictive Analytics

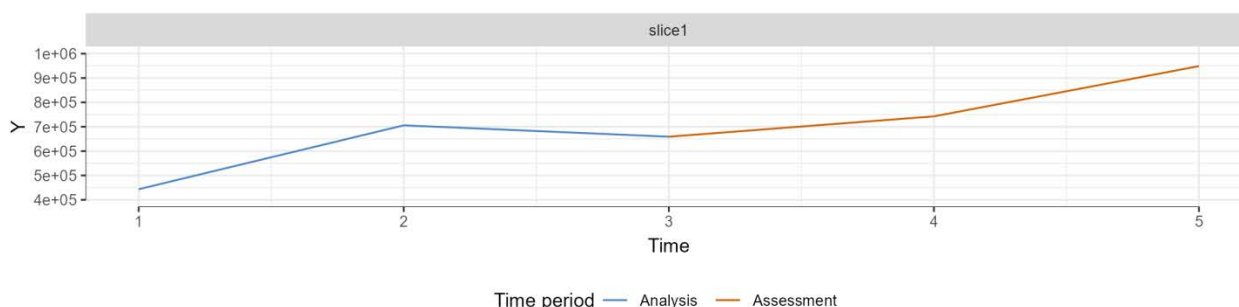
<i>Forecast Evaluation Metric</i>									
	CRPS	DSS	Log score	Cover age	Bias	PIT	MAE	RMSE	R^2
lmSpike1	2.217	5.114	2.718	0.667	-0.509	0.754	4.116	4.148	0.988
lmSpike2	3.053	9.339	3.169	0.000	-0.579	0.789	4.408	4.417	1.000
bstsLinear3	2.677	3.956	3.431	0.000	0.852	0.074	3.787	3.941	0.848
bstsLinear4	2.738	4.119	3.309	0.000	0.864	0.068	3.850	4.008	0.750
bstsAr5	2.185	8.393	2.860	1.000	-0.328	0.664	2.236	2.394	0.999

Source: the analysis was made by the author using the JASP program

The results indicate that the overall value in our study is close to (1) suggesting that positive changes are expected to occur in the next five years. The variables analyzed span the period from 2019 to 2023. Based on

the results of this analysis, a forecast curve for the years 2023 through 2028 has been developed, as illustrated in Figure 5.

Fig. 5. Forecast Evaluation Plan



Source: the analysis was made by the author using the JASP program

The results of the analysis indicate that the concept of the adopted in 2019, did not significantly impact the improvement of the socio-economic situation in the city of Turkestan from 2019 to 2023. Specifically, the variables X3, X4, X8, X10, and X11 were identified as problem areas that require further improvement. It is only after addressing these issues that we observed significant positive changes over the previous five years.

The hypothesis that the effective implementation of the «Listening State» concept will improve the quality of life and socio-economic conditions of the population in Turkestan has not been confirmed.

Discussion and conclusion

The establishment of various communication channels, such as contact centers and social networks, has enabled the collection of a substantial number of inquiries from the residents of Turkestan.

Significant investments in Information and Communication Technologies (ICT) highlight the recognition of the importance of digitalization in enhancing public administration. However, a more detailed investigation is required to assess the efficiency of these investments and their impact on service quality as well as the level of citizen involvement in administrative processes.

Correlation analysis revealed that, although no statistically significant correlations were identified ($p > 0.05$), a negative trend was observed between ICT expenditures (Y1) and certain socio-economic indicators, such as GRP per capita (X4), digital literacy level (X5), and the number of organizations (X8). Initially, this

may seem counterintuitive. It is possible those significant ICT investments in the early stages have not yet led to immediate and direct improvements in these indicators, or that other, stronger factors are influencing them. Additionally, it is conceivable that these investments were allocated to areas not directly related to short-term growth in GRP, digital literacy, or the number of organizations. This suggests that further analysis of the structure of ICT investments and their relationship to various aspects of socio-economic development is necessary in order to identify the most effective investment strategies.

The Bayesian linear regression model demonstrated a weak relationship between total ICT spending and specific socio-economic indicators, with low R^2 values for variables such as X3 (average monthly salary), X4 (GRP), X8 (number of organizations), X10 (investments in fixed assets), and X11 (inflation rate). This implies that an increase in overall ICT spending alone is not a strong predictor of growth in these socio-economic indicators. This finding calls for the development of more targeted ICT investment programs that consider the specific needs of various sectors of the economy and aim to address particular socio-economic challenges.

Bayesian state space models showed a good fit to the data, with high R^2 values and strong goodness of fit according to Harvey's test, making them suitable for forecasting. The presented forecasts suggest the potential for positive changes in the future, assuming that the identified problem areas are addressed.

Predictive analytics revealed an overall positive outlook for the next five years, with values approaching (1),

indicating expected positive changes. These forecasts can be utilized for planning the socio-economic development of the city and evaluating the effectiveness of future administrative decisions.

The results of the study indicate that the implementation of the «Listening State» concept in Turkestan has led to the development of feedback channels and significant ICT investments. However, no direct and clear connection was established between these efforts and substantial improvements in the socio-economic situation between 2019 and 2023.

To ensure this concept effectively contributes to the city's socio-economic development, several key recommendations are proposed:

1. Establish Data-Driven Governance and Feedback Systems – Collecting and utilizing citizen feedback ensures trust, accountability, and improved service delivery.

2. Deploy Targeted ICT Solutions – Tailored digital tools should address local socio-economic issues and enhance service access, particularly for vulnerable groups.

3. Align Education with Labor Market Needs – Updating education and training based on market demand improves employment and economic competitiveness.

4. Support Innovation and Entrepreneurship – Encouraging startups through financial support, tax benefits, and innovation hubs stimulates economic growth.

5. Boost Investment and Infrastructure – A favorable investment climate and modern infrastructure support balanced regional development.

6. Incorporate Socio-Cultural Development into Policy – Community participation in planning reinforces identity and social cohesion.

7. Enhance Evidence-Based Policy – Continuous research and monitoring enable adaptive and responsive policymaking.

In summary, strengthening the implementation of the "Listening State" concept through citizen participation, human capital development, and entrepreneurship will ensure policies are both responsive and sustainable, promoting long-term socio-economic growth in Turkestan.

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«ХАЛЫҚ ҮНІНЕ ҚҰЛАҚ АСАТЫН МЕМЛЕКЕТ» ТҰЖЫРЫМДАМАСЫНЫҢ ӨНІРДІҢ ӨЛЕУМЕТТІК-ЭКОНОМИКАЛЫҚ ДАМУЫНА ӨСЕРІ

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ВЛИЯНИЕ КОНЦЕПЦИИ «СЛЫШАЩЕГО ГОСУДАРСТВА» НА СОЦИАЛЬНО-ЭКОНОМИЧЕСКОЕ РАЗВИТИЕ РЕГИОНА

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