Georgian Scientists
ქართველი მეცნიერები
Vol. 6 Issue 4, 2024
https://doi.org/10.52340/gs.2024.06.04.38

The Concept of Data-Driven Automated Governance

Jaba Tkemaladze[1]

[1]Research Director, Longevity Clinic Georgia Inc.

jtkemaladze@longevity.ge, https://orcid.org/0000-0001-8651-7243

Abstract

Modern public administration faces challenges requiring enhanced efficiency, transparency, and objectivity in evaluating the performance of government officials. This article proposes an innovative approach based on leveraging modern technologies for data collection, analysis, and application in governance systems. The focus is on comprehensive data aggregation, automated information processing, and assessing officials' competencies using key health and public safety indicators. The future of governance lies in integrating technologies and objective data into decision-making processes while enhancing human capabilities beyond artificial intelligence through the extension of high-quality life expectancy.

Keywords: governance, administration, innovation, data, analysis, automation, scenarios, decision-making, optimization

Introduction

Public administration is one of the most complex and responsible spheres upon which societal well-being depends. Traditional systems for evaluating the effectiveness of governance often rely on subjective indicators, leading to risks of corruption, bias, and lack of transparency. Consequently, there is a pressing need to integrate technologies that can objectify evaluation processes and enhance decision-making outcomes. Data-driven decision-making fundamentally transforms governance, enabling promptness, accuracy, and fairness in the implementation of measures aimed at improving citizens' quality of life. Such an approach forms the foundation for building efficient, accountable, and modern governance systems.

Core Principles of the New System

Comprehensive Data Collection and Centralized Database Creation

The technological framework of the proposed system is based on the large-scale collection of data from all available sources, including:

- Healthcare:
  - Date of birth, date of a patient's visit, and healthcare worker's identification number.
  - Costs of diagnostic tests performed by a specific healthcare worker.
  - Service costs associated with individual healthcare workers.
  - Costs of consumables and medications used during care by a specific healthcare worker.
  - Date of service completion by a healthcare worker, date of next visit, and related healthcare worker identification.
  - Date of death, and other pertinent data., etc
- Education:
  - Enrollment date and mentor identification number.
  - Costs of assessments and testing under specific mentors.
  - Service and material costs for mentorship.
  - Costs of textbooks and other learning materials provided by specific mentors.
  - Date of course completion under a mentor, results of developmental tests, and related data., etc
- Law Enforcement:
  - Date of the offense, start and end dates of judicial processes, and judge identification number.
  - Appeal outcomes and sentencing dynamics linked to individual judges.
  - Date of repeat offenses following judgments made by specific judges., etc
- Economy:
  - Average tax payment figures before individuals apply for a bank loan.
  - Date of loan application and bank officer identification.
  - Loan approval dates and credit officer identification.
  - Annual changes in average tax payments by individuals after receiving loans facilitated by specific credit officers., etc

Data Storage and Integrity

The collected data is stored in a secure, centralized database to ensure accessibility and transparency for analytical purposes. A critical aspect of the system is maintaining raw, unprocessed data. Presenting data in its original form avoids manipulation and prevents the creation of misleading statistical interpretations. Statistical processing, if necessary, should be conducted using standardized and transparent methodologies to maintain integrity. By prioritizing original data over pre-analyzed statistics, the system safeguards against the potential distortion of reality, fostering trust and reliability in governance processes.

Automated Data Processing

Data processing is conducted using artificial intelligence (AI) and machine learning (ML), which perform the following tasks:

1. Trend Analysis: AI identifies patterns in statistical and time-series data, revealing trends over short and long periods.
2. Correlation Discovery: The system uncovers relationships between the activities of specific professionals and changes in key indicators, such as life expectancy and quality of life metrics.
3. State Reporting and Predictive Modeling: Reports on current conditions are generated, and the likely impact of proposed actions is forecasted.

The automated approach eliminates the human factor from data analysis, thereby minimizing the risk of bias. Additionally, opposition groups are granted access to develop their own data processing tools, statistical algorithms, and AI systems. This allows for competition between ideas based on objective data, fostering an environment of innovation and transparency.

Measuring the Competence of Specialists

The value of a professional lies not only in their specific expertise but also in their ability to oversee and assess the competence of narrow specialists, many of whom may eventually be replaced by robots. In such a scenario, these professionals will focus on identifying the most effective robotic systems for specific tasks. For instance:

- In healthcare, general practitioners (GPs) represent this versatile role.
- In education, it is mentors.
- In security, judges play the central role.
- In economics, credit officers take precedence.

Transition to Open Elections

Replacing corrupt, closed election systems with open, transparent ones paves the way for evaluating voter competence. This would mean that a single voter would no longer represent one vote but would instead influence election outcomes based on their voter rating.

Objective Metrics for Competence Evaluation

The competence of public servants and specialists is assessed using the following objective metrics:

1. Life Expectancy: A core indicator reflecting the overall intellectual and material well-being of society.
2. Birth Rate: A measure of economic stability and the population's welfare.

3. Violent Deaths and Suicides: Indicators of public safety and the psychological health of society.

These parameters are tracked dynamically and correlated with the activities of specific officials overseeing relevant areas.

Linking Actions to Outcomes

Establishing positive or negative correlations between an official's actions and shifts in these indicators enables an objective evaluation of their performance. This method ensures transparency and accountability in determining their career trajectory, rewarding effective governance while addressing underperformance objectively.

Practical Implementation

To implement the system, the following steps are essential:

1. Establishing a Legal Framework - Develop legislation governing the collection, storage, and usage of data. This framework should ensure data security, protect citizens' privacy, and define the scope of its application in governance.
2. Investing in Infrastructure - Allocate resources to build secure data storage systems and develop sophisticated algorithms for analysis. This includes the physical infrastructure and software solutions for data processing and management.
3. Assembling Multidisciplinary Teams - Form teams combining experts in governance, data analysis, and IT to ensure the system is designed and implemented effectively. These teams will also be responsible for maintaining the system and addressing challenges during its operation.
4. Conducting Pilot Projects - Test the system in selected regions or sectors to evaluate its effectiveness and identify areas for improvement. Pilot programs provide valuable insights before full-scale implementation.

Advantages of the Approach

1. Transparency - Citizens can access data and analysis results, ensuring openness in the evaluation of government performance.
2. Objectivity - By relying on data-driven analysis, the system minimizes the impact of subjective opinions in assessing the effectiveness of officials.
3. Increased Trust - Society is assured that governance effectiveness is measured through objective metrics, fostering confidence in government processes.
4. Adaptability - The system can quickly identify problem areas and implement necessary changes, enabling a proactive approach to addressing societal challenges.

Data-Driven Decision-Making: An Innovative Approach

One of the key elements of the proposed system is a decision-making process based on data analysis. Unlike traditional approaches, where decisions often rely on intuition, subjective assessments, or political agendas, this new model aims to algorithmically structure decision-making, ensuring transparency, justification, and maximum efficiency.

Stages of Decision-Making

1. Data Collection and Aggregation - The first stage involves gathering data from various sources, including government databases, statistical agencies, healthcare institutions, educational organizations, economic departments, and monitoring systems such as satellites, surveillance cameras, and online platforms.

Data is categorized into:

- Operational Data: Real-time information, such as daily crime rates in a region. These metrics are used for short-term forecasting or competency evaluation.
- Strategic Data: Long-term indicators like life expectancy trends, economic shifts, and demographic changes, aiding mid-term projections or evaluations.
- Event-Based Data: Key incident records, such as births or deaths, used for long-term competency assessments or predictions.

This data is aggregated in a centralized database, eliminating duplication and enhancing accuracy for subsequent analysis.

2. Automated Analysis and Problem Identification - Once collected, data is analyzed using machine learning (ML) and artificial intelligence (AI) algorithms. These technologies enable the system to:

- Identify Patterns: For example, the correlation between general practitioners' expertise and life expectancy improvements.
- Predict Decision Impacts: Projecting outcomes of increased funding for a specific social program.
- Detect Anomalies: Highlighting sudden spikes in violent deaths in a particular region.

Priority issues requiring immediate attention are compiled at this stage.

3. Scenario Development - AI generates multiple scenarios for addressing the identified problems, modeling their potential outcomes. Each scenario is evaluated based on:

- Short-Term Effects: Immediate changes following implementation.
- Long-Term Consequences: Impacts on key indicators over 5, 10, or more years.
- Risks and Side Effects: For instance, increased taxation might reduce household incomes.

Scenarios are accompanied by analytical reports, visual aids, and predictive metrics.

4. Optimal Scenario Selection - Scenario selection is guided by multiple criteria:

- Target Indicators: Which scenario maximizes improvements in life expectancy, birth rates, and reductions in violent deaths?
- Economic Efficiency: What resources are required for implementation?
- Social Support: How many citizens back the proposed measures (based on public opinion analysis)?

Decisions are not finalized manually but are assigned quantitative ratings using a ranking system. The approved scenario is either confirmed by a human specialist or returned for revision with AI-generated adjustments. Opposition groups can access these decisions online and contest them, proposing alternative solutions via their own AI systems.

5. Decision Implementation and Monitoring - Once an optimal scenario is selected, it is handed over to the relevant authorities for implementation. This stage emphasizes:

- Execution Monitoring: Real-time tracking of implementation progress.
- Effectiveness Assessment: Algorithms compare expected results with actual outcomes, quickly identifying deviations.
- Adaptive Adjustments: If the measures fail to achieve desired effects, the scenario is revisited and adapted accordingly.

Advantages of the Algorithmic Approach

1. Objective Decisions - Removes subjective biases and human predispositions.
2. Transparency - Every stage-from data analysis to scenario selection—is documented and accessible for scrutiny.
3. Flexibility - Decisions can be adapted dynamically in response to emerging challenges or new data.
4. Rapid Response - Problems are quickly identified, and solutions are generated without delay.

Example: Addressing a Surge in Violent Deaths

Suppose a region experiences a sharp increase in violent deaths. The decision-making process might unfold as follows:

1. Problem Identification - The system detects the rise based on operational police data.
2. Analysis and Diagnosis - AI analysis reveals that the cause is reduced law enforcement personnel in high-risk areas.
3. Scenario Development - Three scenarios are proposed:
    - Increase police presence in affected neighborhoods.
    - Implement rehabilitation programs for high-risk individuals.
    - Boost funding for prevention initiatives.

4. Scenario Selection - Based on predictive models, the scenario with the most promising outcomes is chosen and implemented.
5. Monitoring and Adjustment - Real-time tracking ensures measures are effectively applied, with corrections introduced as needed to optimize results.

This structured, data-driven approach ensures decisions are not only evidence-based but also transparent, adaptable, and impactful.

Discussion

Modern technologies, including big data, artificial intelligence, and automated decision-making systems, offer significant opportunities for improving public administration. However, their implementation requires thorough analysis of risks, ethical aspects, and technological and social challenges.

Potential Advantages

1. Error Reduction and Increased Efficiency - Data-driven systems can minimize human errors, enhancing the precision and speed of decisions. For example, analyzing medical data can identify resource shortages in hospitals long before they become critical.
2. Elimination of Bias - Data can remove the subjectivity inherent in traditional processes. An example is the evaluation of officials' performance based on measurable outcomes rather than subjective reports or personal preferences of leadership.
3. Crisis Prediction - Machine learning models can forecast crises such as crime surges or disease outbreaks, enabling governments to take preventive measures.

Ethical and Social Challenges

1. Privacy and Data Protection - The total collection of data, especially from citizens' private lives, raises concerns about confidentiality. Can governments guarantee that this data will not be used for surveillance or discrimination? Strict regulations limiting data use to public interests, along with encryption and anonymization, are essential.
2. Algorithmic Bias - Artificial intelligence is trained on historical data, which may contain inaccuracies, bias, or discrimination. This could reinforce existing inequalities. Independent experts should oversee algorithm development and test them for fairness.
3. Dehumanization of Governance - Automated decision-making systems may overlook humanitarian aspects. For instance, statistically justified decisions to cut funding for specific sectors might be socially unacceptable. Automation must be paired with human oversight to consider moral and ethical factors.

Organizational and Technical Barriers

1. Infrastructure Costs - Building data collection, storage, and analysis systems requires significant financial and technological resources. Phased implementation, starting with pilot regions or sectors where data is already available, is recommended.
2. Data Integration - The complexity of integrating data from various fields, such as healthcare, education, and law enforcement, arises from differences in storage standards and data formats. Developing unified data exchange standards is a crucial step in system implementation.
3. Resistance within the System - Government officials and bureaucrats might perceive the new system as a threat to their positions due to increased transparency. Overcoming this resistance requires a motivation system, including training, career growth, and participation in developing new processes.

Measuring System Success

1. Objective Metrics - The system should rely on clear indicators to measure the success of its implementation:
    - Reduction in corruption, including nepotism.
    - Increases in life expectancy and birth rates.
    - Reduction in violent deaths and suicides.
2. Assessment of Long-Term Consequences - Some decisions may have delayed effects that become evident only years later. For instance, changes in educational policies affect society over decades. Models capable of considering the long-term consequences of decisions need to be developed.

Global Context

There are already successful examples of data-driven governance worldwide:

- Estonia: E-government with a transparent data processing system.
- China: Utilization of big data and AI to monitor and predict social behavior (social credit system).
- Singapore: Analytics for forecasting crime growth and disaster prevention.

However, it is crucial to consider the cultural, political, and legal specificities of each country. How universal are the models implemented in other countries, and how can they be adapted to local conditions?

Conclusion

Decision-making automation in public administration offers significant prospects for improving efficiency, transparency, and accountability. However, it is essential to address not only technological aspects but also ethical, social, and organizational challenges. A balanced approach combining AI capabilities with human experience can help build a sustainable and fair governance system for the benefit of citizens. Humanity is ceasing to reproduce and faces extinction, much like the Neanderthals. Progressive societies are seeking solutions through technologies for unlimited living space, nutrition, health, and rejuvenation. While issues with space, food, and health are nearly solvable based on existing scientific and technological advances, eternal youth remains a subject of debate and theoretical exploration. Recently, theoretical research yielded an undeniable logical result: aging is caused by entropy accumulation (Hayflick, 2021), specifically due to the selective accumulation of the oldest centrioles in stem cells (Tkemaladze et al., 2001–2024). While science works on turning this theoretical achievement into technology, society and governments should prepare for "post-humans" with indefinite lifespans, becoming smarter and more efficient. The use of technologies for total data collection and processing in public administration opens new perspectives for increasing efficiency and transparency. Evaluating officials based on objective metrics, such as life expectancy, birth rates, and violent death rates, will minimize corruption and improve governance quality. Interestingly, the U.S. President elected in 2024, Donald Trump, plans to establish a Department of Efficiency, with Elon Musk as its leader (Trotta, 2024). Trump also intends to appoint Jim O'Neill, former president of the SENS Research Foundation, as Secretary of Health (Garth, 2024). This appointment may reflect the emphasis on increasing life expectancy as a measure of government officials' effectiveness. The future of governance lies in integrating technologies and objective data into decision-making processes, extending human competence beyond AI through enhanced life quality and longevity.

References:

1. Chichinadze, K., Lazarashvili, A., & Tkemaladze, J. (2013). RNA in centrosomes: structure and possible functions. Protoplasma, 250(1), 397-405.
2. Chichinadze, K., Tkemaladze, J., & Lazarashvili, A. (2012). A new class of RNAs and the centrosomal hypothesis of cell aging. Advances in Gerontology, 2(4), 287-291.
3. Chichinadze, K., Tkemaladze, J., & Lazarashvili, A. (2012). Discovery of centrosomal RNA and centrosomal hypothesis of cellular ageing and differentiation. Nucleosides, Nucleotides and Nucleic Acids, 31(3), 172-183.
4. Chichinadze, K., Tkemaladze, D., & Lazarashvili, A. (2012). New class of RNA and centrosomal hypothesis of cell aging. Advances in Gerontology= Uspekhi Gerontologii, 25(1), 23-28.
5. Chichinadze, K. N., & Tkemaladze, D. V. (2008). Centrosomal hypothesis of cellular aging and differentiation. Advances in Gerontology= Uspekhi Gerontologii, 21(3), 367-371.

6. Garth E. (2024). Trump nominates Jim O'Neill as Deputy Secretary of Health. https://longevity.technology/news/trump-nominates-jim-oneill-as-deputy-secretary-of-health/
7. Hayflick, L. (2021). The greatest risk factor for the leading cause of death is ignored. *Biogerontology*, *22*(1), 133-141.
8. Jaba, T. (2022). Dasatinib and quercetin: short-term simultaneous administration yields senolytic effect in humans. Issues and Developments in Medicine and Medical Research Vol. 2, 22-31.
9. Kipshidze, M., & Tkemaladze, J. (2024). Abastumani Resort: Balneological Heritage and Modern Potential. Junior Researchers, 2(2), 126–134. doi: https://doi.org/10.52340/jr.2024.02.02.12
10. Kipshidze, M., & Tkemaladze, J. (2024). Microelementoses - history and current status. Junior Researchers, 2(2), 108–125. doi: https://doi.org/10.52340/jr.2024.02.02.11
11. Kipshidze, M., & Tkemaladze, J. (2023). The planaria Schmidtea mediterranea as a model system for the study of stem cell biology. Junior Researchers, 1(1), 194–218. doi: https://doi.org/10.52340/2023.01.01.20
12. Kipshidze, M., & Tkemaladze, J. (2023). Comparative Analysis of drugs that improve the Quality of Life and Life Expectancy. Junior Researchers, 1(1), 184–193. doi: https://doi.org/10.52340/2023.01.01.19
13. Kipshidze, M., & Tkemaladze, J. (2024). Balneology in Georgia: traditions and modern situation. Junior Researchers, 2(2), 78–97. doi: https://doi.org/10.52340/jr.2024.02.02.09
14. Lezhava, T., Monaselidze, J., Jokhadze, T., Kakauridze, N., Khodeli, N., Rogava, M., Tkemaladze, J., ... & Gaiozishvili, M. (2011). Gerontology research in Georgia. Biogerontology, 12, 87-91. doi: 10.1007/s10522-010-9283-6. Epub 2010 May 18. PMID: 20480236; PMCID: PMC3063552
15. Matsaberidze, M., Prangishvili, A., Gasitashvili, Z., Chichinadze, K., & Tkemaladze, J. (2017). TO TOPOLOGY OF ANTI-TERRORIST AND ANTI-CRIMINAL TECHNOLOGY FOR EDUCATIONAL PROGRAMS. International Journal of Terrorism & Political Hot Spots, 12.
16. Prangishvili, A., Gasitashvili, Z., Matsaberidze, M., Chkhartishvili, L., Chichinadze, K., Tkemaladze, J., ... & Azmaiparashvili, Z. (2019). SYSTEM COMPONENTS OF HEALTH AND INNOVATION FOR THE ORGANIZATION OF NANO-BIOMEDIC ECOSYSTEM TECHNOLOGICAL PLATFORM. Current Politics and Economics of Russia, Eastern and Central Europe, 34(2/3), 299-305.
17. Tkemaladze, J. (2024). Elimination of centrioles. Georgian Scientists, 6(4), 291–307. doi: https://doi.org/10.52340/gs.2024.06.04.25
18. Tkemaladze, J. (2024). The rate of stem cell division decreases with age. Georgian Scientists, 6(4), 228–242. doi: https://doi.org/10.52340/gs.2024.06.04.21
19. Tkemaladze, J. (2024). Absence of centrioles and regenerative potential of planaria. Georgian Scientists, 6(4), 59–75. doi: https://doi.org/10.52340/gs.2024.06.04.08
20. Tkemaladze, J. (2024). Main causes of intelligence decrease and prospects for treatment. Georgian Scientists, 6(2), 425–432. doi: https://doi.org/10.52340/gs.2024.06.02.44

21. Tkemaladze, J. (2024). Cell center and the problem of accumulation of oldest centrioles in stem cells. Georgian Scientists, 6(2), 304–322. doi: https://doi.org/10.52340/gs.2024.06.02.32
22. Tkemaladze, J., & Samanishvili, T. (2024). Mineral ice cream improves recovery of muscle functions after exercise. Georgian Scientists, 6(2), 36–50. doi: https://doi.org/10.52340/gs.2024.06.02.04
23. Tkemaladze J. Editorial: Molecular mechanism of ageing and therapeutic advances through targeting glycative and oxidative stress. Front Pharmacol. 2024 Mar 6;14:1324446. doi: 10.3389/fphar.2023.1324446. PMID: 38510429; PMCID: PMC10953819.
24. Tkemaladze, Jaba and Kipshidze, Mariam, Regeneration Potential of the Schmidtea Mediterranea CIW4 Planarian. Available at SSRN: https://ssrn.com/abstract=4633202 or http://dx.doi.org/10.2139/ssrn.4633202
25. Tkemaladze, J. (2023). Is the selective accumulation of oldest centrioles in stem cells the main cause of organism ageing?. Georgian Scientists, 5(3), 216–235. doi: https://doi.org/10.52340/2023.05.03.22
26. Tkemaladze, J. (2023). Cross-senolytic effects of dasatinib and quercetin in humans. Georgian Scientists, 5(3), 138–152. doi: https://doi.org/10.52340/2023.05.03.15
27. Tkemaladze, J. (2023). Structure and possible functions of centriolar RNA with reference to the centriolar hypothesis of differentiation and replicative senescence. Junior Researchers, 1(1), 156–170. doi: https://doi.org/10.52340/2023.01.01.17
28. Tkemaladze, J. (2023). The centriolar hypothesis of differentiation and replicative senescence. Junior Researchers, 1(1), 123–141. doi: https://doi.org/10.52340/2023.01.01.15
29. Tkemaladze, J. (2023). Reduction, proliferation, and differentiation defects of stem cells over time: a consequence of selective accumulation of old centrioles in the stem cells?. Molecular Biology Reports, 50(3), 2751-2761.
30. Tkemaladze, J. Long-Term Differences between Regenerations of Head and Tail Fragments in Schmidtea Mediterranea Ciw4. Available at SSRN 4257823.
31. Tkemaladze, J., & Apkhazava, D. (2019). Dasatinib and quercetin: short-term simultaneous administration improves physical capacity in human. J Biomedical Sci, 8(3), 3.
32. Tkemaladze, J., Tavartkiladze, A., & Chichinadze, K. (2012). Programming and Implementation of Age-Related Changes. In Senescence. IntechOpen.
33. Tkemaladze, J., & Chichinadze, K. (2010). Centriole, differentiation, and senescence. Rejuvenation research, 13(2-3), 339-342.
34. Tkemaladze, J. V., & Chichinadze, K. N. (2005). Centriolar mechanisms of differentiation and replicative aging of higher animal cells. Biochemistry (Moscow), 70, 1288-1303.
35. Tkemaladze, J., & Chichinadze, K. (2005). Potential role of centrioles in determining the morphogenetic status of animal somatic cells. Cell biology international, 29(5), 370-374.
36. Trotta D., & Beech E. (2024). Trump names Elon Musk to lead government efficiency drive. https://www.reuters.com/world/us/trump-says-elon-musk-vivek-ramaswamy-will-lead-department-government-efficiency-2024-11-13/

37. Прангишвили, А. И., Гаситашвили, З. А., Мацаберидзе, М. И., Чичинадзе, К. Н., Ткемаладзе, Д. В., & Азмайпарашвили, З. А. (2017). К топологии антитеррористических и антикриминальных технологии для образовательных программ. В научном издании представлены материалы Десятой международной научно-технической конфе-ренции «Управление развитием крупномасштабных систем (MLSD'2016)» по следующим направле-ниям:• Проблемы управления развитием крупномасштабных систем, включая ТНК, Госхолдин-ги и Гос-корпорации., 284.
38. Ткемаладзе, Д., Цомаиа, Г., & Жоржолиани, И. (2001). Создание искусственных самоадаптирующихся систем на основе Теории Прогноза. Искусственный интеллект. УДК 004.89. Искусственный интеллект. УДК 004.89.
39. Чичинадзе, К., Ткемаладзе, Д., & Лазарашвили, А. (2012). НОВЫЙ КЛАСС РНК И ЦЕНТРОСОМНАЯ ГИПОТЕЗА СТАРЕНИЯ КЛЕТОК. Успехи геронтологии, 25(1), 23-28.