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Localising Smart Urban Development in Azerbaijan

Introduction by the Special Editor Anar Valiyev

Cities urgently need innovative organisational and institutional arrangements to solve a great variety of emerging technical, physical, and social problems. Since the mid-2000s, global interest in innovative urban development has experienced a significant surge due to the increasing capabilities of new technology, as well as the ever-growing number of people living in urban areas. There is an urgent need for a 'smart city' concept to ensure real changes in the lives of these people rather than being merely a prestigious 'paper-tiger'. The literature generally defines the term 'smart city' as applications and technologies applied in cities and communities, to improve the quality of life and work in the region, ease the spread of information and communication technologies (ICT) and, most importantly, help in making the cities 'inclusive, safe, sustainable and resilient' envisioned in the UN's 11th Sustainable Development Goal.

The recent Covid-19 pandemic and re-establishment of control over territories in the Karabakh region accelerated the need to restore the cities and villages affected by these emergencies. For this reason, the government of Azerbaijan has launched the process of smart city/village development as a means of achieving its development goals. Therefore, there is an urgent need to change the status quo and design a model that will improve all cities in Azerbaijan in an efficient and effective way and concomitantly accelerate economic growth. The following issue of the Caucasus Analytical Digest sheds light on the current situation and documents starting conditions in Azerbaijan in terms of future smart-city development, challenges in implementing this concept, areas that need to be developed further, and finally, how the smart city concept can help to redevelop the Karabakh region.

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Building Smart Cities in Azerbaijan: Hard to Conceptualise, Difficult to Build

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Abstract

This article opens a general discussion about the concept of the 'smart city' and how it can be understood in the context of urban affairs. Furthermore, it discusses the problems of conceptualisation and operationalisation of smart city projects in Azerbaijan and elsewhere, and the ways in which they can lead to project failure. The article also addresses the problems of implementation of the smart city concept in the country and discusses how to adapt general visions and global aspirations for smart and sustainable cities to the Azerbaijani context. Furthermore, the author suggests which metrics and policy domains the authorities should consider when translating the smart city visions into policy. He discusses the preconditions for success, and whether Azerbaijan has the necessary infrastructure and specialists for its implementation.

What is the 'Smart City'? Conceptual Framework

In today's world, cities are the main drivers of development and innovations that shape the future of countries. According to United Nations Population Fund (UNFPA) statistics, more than half of the world's population lives in cities. However, this proportion is rapidly increasing and is expected to reach 70% by the year 2050 (UNFPA, 2007). This ongoing massive urbanisation process leads to enormous resource consumption, which results in negative consequences for the environment (Deuskar, 2015).

This rapid growth in urban populations leads to a variety of technical and infrastructure-oriented problems, such as difficulties in waste management, scarcity of resources, air pollution, human health concerns, traffic congestion, and deteriorating infrastructure. Urbanisation also creates new, complex social issues, and combatting the drawbacks of urbanisation requires the collaboration of government, community, city agencies, non-profit organisations, etc. Cities urgently need innovative organisational and institutional arrangements to solve a great variety of emerging technical, physical, and social problems, for example, lack of citizen engagement in city planning decision-making processes.

Since the mid-2000s, a global interest in smart cities has surged due to technological advancement, as well as an increasing number of people living in urban areas. It is an ever-growing challenge to supply urban populations with basic resources such as clean water, secure food supply, and sufficient energy, while also ensuring overall economic, social and environmental sustainability. In this case there is a need for 'smart city' concepts to leave a better world to future generations. The literature generally defines the term 'smart city' as applications and technologies directed at cities and communities, to improve the quality of life and work in the region, ease the spread of information and communication technologies (ICT), and, most importantly, achieve sustainability.

Azerbaijan is among the many countries currently facing the challenges of rapid urbanisation and management of growing cities. Over the past 25 years, the population of Azerbaijan has grown almost by 2 million, reaching 10 million people.[1] Meanwhile, massive migration of the country's rural population to urban centres has led to further challenges. Thus, for example, Baku now has around 2.4 million inhabitants, while the Area (the territory encompassing Baku, Khirdalan, Absheron and surrounding rural areas in which populations move into the city for work, study and leisure) may have a population of more than 4 million. Currently, 35% of the metropolitan area's labour force, or around 1.5 million people, live in rural areas. Meanwhile, the country may only be able to support a much smaller population through sustainable agriculture.

The rural population's migration to urban areas is expected to accelerate due to increased technological innovation in agriculture. With the high cost of the Covid-19 pandemic, it is expected that within a few years more than one million people will migrate to urban areas, and primarily to Baku. Furthermore, massive car ownership in the Baku area constitutes one of the most rapidly worsening problems in the region's urban development. Since the beginning of 2000, car ownership has increased from 55 to 143 cars per 1,000 residents.[2] Finally, the absence of new approaches to governance and reliance on the old Soviet system of city management in Azerbaijan make the situation worse (Baku is the only European capital that does not elect its mayor, but rather has one appointed by the president).

In this context, the government of Azerbaijan and local urban administrations believe that the smart city concept and technological innovations can solve the society's endemic problems. However, the local authorities forget that issues with incorrect/insufficient conceptualisation have led to many problems, including the failure of several smart city projects. Lavasa (India), Ordos (China) and Santander (Spain) serve as examples of cities which had great plans, but failed to grow organically as needed by citizens due to overly idealistic implementation. The following article examines Azerbaijan's attempts at implementing the smart city concept the problems the republic may face in their implementation, and recommendations for avoiding said problems.

'Lost in Translation' Problem

The recent Covid-19 pandemic and the Forty-Four Day War between Azerbaijan and Armenia over the Karabakh region accelerated the need to restore the cities and villages affected by both pandemic and war. Hence, Azerbaijan's government launched the process of smart city/village development as a solution for tough-to-crack developmental challenges. Therefore, there is an urgent need to change the status quo and design a model which will improve all of Azerbaijan's cities in an efficient and effective way while accelerating economic growth at the same time. The emergence of the Covid-19 pandemic forced rapid digitalisation in both the public and private sectors. The recent situation has forced the government and citizens to adapt to rapid change with the help of technology.

Hence, the smart city/village concept is a primary agenda item in terms of plans for sustainable development in the Karabakh region. Azerbaijan is in the beginning of the process; in April 2021, President Ilham Aliyev signed an order to develop smart city/smart village projects 'to improve the quality, safety and efficiency of services provided in urban and rural areas, utilising information technology and ensuring the effective use

1 See State Statistical Committee of the Republic of Azerbaijan (2020) 'Information Society', https://www.stat.gov.az/source/information_society/?lang=en (accessed 18 July 2021).

2 See State Statistical Committee of the Republic of Azerbaijan (2020) 'Information Society', https://www.stat.gov.az/source/information_society/?lang=en (accessed 18 July 2021).

and management of available resources'.[3] Furthermore, the government assigned the Ministry of Technology to come up with a concept paper (i.e., recommended policy actions) for smart city implementation. However, the biggest challenge for the government would be in the proper conceptualisation and operationalisation of the smart city approach. If the government would think of the smart city approach only as a group of cost-optimising technological breakthroughs, then the project of smart cities in Azerbaijan, and especially in the Karabakh region, would fail.

The smart city concept in Karabakh thus needs to take a different approach to that in Baku. If in Baku this concept should be operationalised as an optimisation tool for facilitating and easing of transactions, traffic, utility management and other services, in Karabakh the concept should serve the purposes of attracting the population back to the region and making their lives comfortable. Meanwhile, smart city concepts in other Azerbaijani cities would serve different purposes. The concept paper would also need to make this fuzzy term more applicable and understandable at all administrative levels and for all groups of stakeholders. Moreover, the concept should be applicable to the realities of Azerbaijan and its existing system of governance and local conditions. The failure of such projects in India or China were a result of using a 'copy-and-paste' approach to smart city concept Absence of understanding of how to handle and manage the data, open and transparent data exchange, and inclusive decision-making as well as high-level coordination were common problems that also apply to the situation in Azerbaijan. Thus, the Azerbaijani government should as a first step make the concept of 'smart cities' applicable to local realities; easy to understand at each level; and operational and relying on human capital (i.e., the people) rather than on technologies.

What Is Needed to Succeed? Infrastructure

To be successful in implementing the smart city concept, the country needs to possess certain infrastructure allowing the cities to capture data and use it in order to make rapid decisions. From this perspective, the situation in Azerbaijan is problematic. Certain districts do already enjoy high-speed internet, the latest innovations, and technologies, while whole regions of the country are hold back by the slowest internet speeds in Europe. Azerbaijan also has a particularly high digital divide between urban and rural areas. There is a 20-percentage point gap between rural and urban households in fixed internet penetration. This digital divide exists mainly due to insufficient fixed infrastructure and lower levels of digital literacy in rural areas (ADB, 2018). The country also needs to make broadband internet faster, cheaper, and more accessible. Based on data from UK internet company Cable for 2021, Azerbaijan ranks 167th globally in terms of broadband internet speed with its 6.63 Megabits per second download speed, while neighbours Armenia and Georgia boast speeds two to three times as fast.[4] The reason for this regrettable situation is that Azerbaijan's internet market is monopolized by Delta Telecom, the only internet provider in the country. The government does not regulate the market properly, and Delta Telecom, being a monopolist, is not interested in additional investments due to its constant revenue flow and the absence of competition.

From another perspective, there exists a great variety of housing in Azerbaijan, having correspondingly varied levels of adaptability in terms of potential 'smart' programmes. Some of them use smart meters (for electricity, gas and water) while other still have traditional mechanical meters which make it difficult to implement smart city concepts. The same situation is observed with waste management, which has to this point not applied any modern innovations to its trash collection and recycling programmes. In addition, cities in Azerbaijan would need to invest huge sums in data meters including new 'smart' traffic lights, various detectors, smart meters, etc. The central government would be unlikely to spend the billions of dollars necessary to install these meters as the benefits would not be immediately visible, while citizens would be uninterested in higher household bills and/or taxes.

What Is Needed to Succeed? Governance and Innovation

While all of the mentioned problems can be fixed with technological advances and technical solutions, the main hurdle is the issue of governance. In all cities where the smart city concept has been successfully implemented, public participation and involvement in decision-making has proved essential. Without involvement of the population and considering their positions when making decisions, no smart city concept can work. One of the main problems in Azerbaijan is that it follows a monocentric model in its administration and urbanisation processes. In other words, Azerbaijan's highly centralised system of governance prevents or discourages involvement of the public and representatives of civil society, making it nearly impossible for them to impact deci-

3 '"Ağıllı şəhər" (Smart City) və "Ağıllı kənd" (Smart Village) konsepsiyasının hazırlanması haqqında', Decree No. 2584, 19 April 2021. Available at: http://e-qanun.az/framework/47263 (accessed 17 August 2021).

4 'Worldwide Broadband Speed 2021', Cable.co.uk. Available at: https://www.cable.co.uk/broadband/worldwide-speed-league/2021/worldwide_speed_league_data.xlsx (accessed 10 December 2021).

sion-making process. The current situation specifically shows that it becomes very difficult to manage large cities through traditional means, and there is a great need for new innovative (perhaps e-)governance and management to help solve worsening traffic woes as well as environmental challenges, waste and utility management issues, education reform health/pandemic management, and other matters of public concern. Meanwhile, lack of administrative, political, and financial powers by local municipalities (the only elected local bodies) makes them a nearly completely useless tier of governance. Thus, the government of Azerbaijan should think about empowering municipalities in order to help reach these ambitious goals. Bringing municipalities and local communities into the decision-making process could be one of the solutions in laying the groundwork for Azerbaijani 'smart cities'. Moreover, if the central government tries to entice its population back to de-occupied territories, it should think about not only technological innovations, but also about new modes of governance with higher levels of empowerment of local authorities and more participation of local populations.

From another perspective, the country and its cities need strong innovation potential and education. The most recent edition of the Global Innovation Index ranked Azerbaijan 82nd among 131 countries in terms of innovation potential. Azerbaijan's weakest sub-category? Knowledge and technology output. High-tech exports account for less than 0.1% of Azerbaijan's gross domestic product, thus knowledge impact and knowledge creation are negligible (Dutta et al., 2021).

What Is Needed to Succeed? People

According to household survey data on ICT use reported by Azerbaijan's State Statistical Committee, in 2018 only 15% of individuals used the internet to interact with authorities and avail themselves of public services, and 7% for education or learning activities. The technology and user knowledge of e-commerce and e-payment systems is limited, and trust in such systems is low. Only one in 20 people in Azerbaijan purchased something online in 2017, compared to a worldwide average of almost one in four people.[5] Azerbaijan ranks 68th out of 144 countries on the B2C e-Commerce Index due to low penetration of e-payments, including credit and debit cards, a shortage of domestic online shops, underdeveloped logistics, a lack of trust on the part of both buyers and sellers, and low digital literacy among the population (ADB, 2018). The use of digital payments and financial services is also low in Azerbaijan. Less than one-third of the population has a bank account, and only one quarter has a debit card, many of which are social insurance and salary cards. Mobile and internet-based digital payment tools are rarely used due to limits on transaction amounts and other restrictions. Another barrier is the high transaction fees associated with international credit card payment networks as well as not developed banking system. The Covid-19 pandemic may have spurred change in this area, but nevertheless not evenly. While Baku and other large cities switched largely to online transactions, rural areas and most of the smaller cities continued to rely on traditional methods.

Conclusion and Recommendation

Despite all the challenges, establishing smart cities or smart villages in Azerbaijan is doable. There are, however, several important issues to be addressed before any major step forward can occur, one of which is financing. Building smart cities or implementing this concept would require massive investments into city infrastructure. Government can take on partial responsibility, but for the smart cities projects to succeed, the private sector must also be involved. Private business would need to be encouraged and incentivised to invest. This would require changing the current business environment, including protection of investments, ensuring a fair and just court system, etc. This can be easily done with the government initiatives. What cannot be done within a short period of time is to train and give birth to new clusters of creative and smart people working in various creative industries. The government of Azerbaijan first should understand why they need smart cities, what purposes they would serve. Next, the political establishment would need to come up with its own strategy and actions, not merely copying examples from other countries, a path which has led smart city project in other countries to failure. The government should pay particular attention to educating, nurturing, and developing its own experts and specialists to make future smart cities sustainable and stable. Finally, the government should pay great attention to governance issues as well as involving citizens/civil society into decision-making processes. Otherwise, billions of US dollars spent on technologies, foreign consultancies as well as construction projects would go to waste, adding additional pressure on the government to solve Azerbaijan's growing urbanisation problems.

Please see overleaf for information about the author and references.

5 See State Statistical Committee of the Republic of Azerbaijan (2020) 'Information Society', https://www.stat.gov.az/source/information_society/?lang=en (accessed 18 July 2021).

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The Beginning of a 'Smart Development Era' in Azerbaijan: Smart Technologies and/vs Smart Decision-Making

Bairam Akhundov

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Abstract
The past few years in Azerbaijan have been marked by growing government interest in using 'smart' solutions in urban and rural planning. The results of the Karabakh conflict pushed these aspirations even further, with 'smart' technologies being seen as the key instruments in the redevelopment of the de-occupied territories. Since cities are vital mechanisms for economic growth, it is generally believed that applying modern technologies in urban and regional planning can increase the economic performance of a nation while ensuring sustainability. This article will discuss Azerbaijan's existing experience in 'smart' development and examine the extent to which the wider public participates (or will have an opportunity to participate) in the ongoing and future reforms.

Why Aim at Growing 'Smartly'?
Apart from being the greatest contributors to economic growth, Azerbaijan's cities account for 70% of its greenhouse gas emissions and 60% of resource use.[1] In view of the looming problem of climate change, it is vital to rethink our cities according to the key principles of sustainable development. Recent years have demonstrated an increased interest in applying sustainable solutions in urban planning. Today, the concept of 'smart cities' is widely cited in the media and research as a potential solution to the 'economic growth vs climate change mitigation' dilemma and is seen as a panacea for the sustainable development of cities. The recent months demonstrate that the government of Azerbaijan appreciates the potential of smart technologies as promising and efficient tools for the redevelopment of the de-occupied districts of the Karabakh region, a result of the recent war between Azerbaijan and Armenia. As a developing

1 See the United Nations' Sustainable Development Goals for Cities. Available at: https://www.un.org/sustainabledevelopment/cities/ (accessed 24 July 2021).