COMPARATIVE ANALYSIS OF TARGET INDICATORS OF APPROACHES IN THE CONCEPT OF SECURITY ON IMPLEMENTED CONCEPTUAL PROJECTS "SMART CITY" AND "SAFE CITY"

[1]Jamshid Isroilov, [2] Erzhan Tashmanov, [3]Najmiddin Turaxodjaev, [4]Sherzod Pulatov

[1]Tashkent University of Information Technologies Named after Muhammad al-Khwarizmi,
[2]University of Public Safety of the Republic of Uzbekistan
[3]Academy of the Ministry of Internal Affairs of the Republic of Uzbekistan,
[4]Tashkent University of Information Technologies Named after Muhammad al-Khwarizmi

K E Y W O R D S

Safe city, Smart city, hardware and software complex, telecommunications information system, Telecommunications infrastructure, situation center, monitoring, subsystems, video identification.

A B S T R A C T

This article presents a comparative analysis of approaches to the concept of security implemented in the concept projects "Smart City" and "Safe City". And also the concept of building and developing the hardware-software complex "Safe City", the requirements for the telecommunications infrastructure and its quality parameters are considered, examples of building the architecture of the video identification system are given.

Introduction

The concepts of "safe city" and "smart city" are used by different countries to solve the same complex long-term problems of security and sustainable development of the urban environment, which in UN terminology are called "smart sustainable" city (smart sustainable city). However, focusing on the complex of the same problems of sustainable development, concepts in foreign countries do not combine them into a single area of practical activity, still considering each problem separately and in accordance with the industry (functional) affiliation. As a result, there is a fragmentation of existing approaches to the application of organizational, informational, analytical, forecasting and other methodological, technical and technological solutions to ensure the safety and sustainable development of cities, which is exacerbated by the geographical, economic, political, social specifics of countries, as well as their accumulated scientific and technological technical potential. In practice, each of the countries, moreover, each city, implements the provisions of the concepts not only at its own discretion, often changing the focus, but, most importantly, outside the uniform standards of international information exchange [1-17].

International experience in security, included in the concept of "smart city".

In the US, some life safety issues are included in the concept of "smart city". However, the government is focusing on increasing the economic potential of urban infrastructure and creating a comfortable urban environment. Automated and intelligent systems, data analytics in the field of response to crises and incidents do not have a separate conceptual basis.

European countries are also pursuing a policy of integrating security issues into their own smart city projects in line with the UN sustainable development concepts, as is the case in France and Finland, where the automated security system ERICA is deployed. European countries are building "safe city" systems exclusively at the municipal level in order to avoid criticism of the national government by the media and the public (for example, in the Czech Republic and the UK.

In the People's Republic of China, the word "safe" in the phrase "safe city" is more accurately translated as "prosperous and safe", which implies the equivalence of security and social welfare. At the conceptual level, the construction of "safe cities" is presented as part of the construction of a "safe China". "Safe China" is a large-scale goal that covers all areas of the well-being of citizens. The level of such integration does not yet exist.

Singapore also lacks a separate concept of a "safe city". Singapore's concept of "Smart Nation"

("Smart Nation") is the close interweaving of "safe" and "smart" city and is aimed mainly at improving the standard of living of people through the digitalization of city services. The way to solve these problems, in accordance with the "world practice" referred to in the concept, is to involve private business in solving socially significant problems and establish public-private partnerships.

MAIN PART

Uzbekistan. According to the adopted program, the concept of creating and developing a single agro-industrial complex "Safe City".

SMART CITY INITIATIVE	AREA	SMART CITY INITIATIVE	ELEMENTS IN UZBEKISTAN
SMART PEOPLE	DIGITAL EDUCATION CREATIVITY	- Centre for learning new technologies - Internet in schools - Centre for creating apps	- E-LEARNING - ZIYONET.UZ - SOFTWARE.UZ - "BePro" LLC
SMART LIVING	TOURISM & CULTURE HEALTH & SAFETY TECHNOLOGY ACCESIBILITY	- tourism app - e-health - accessibility in public places - Telecare - free wifi - optical fibre - citizen card	- Mexmonxona.uz - Free wi fi zones in public places - Med Card system (in process) - Digital telecare

Figure-1. Smart City Project under "Electronic government" system development center under ministry of information technologies and communications of the Republic of Uzbekistan.

The concept is planned to be implemented in four stages:

2019-2021 - formation of the territory profile, assessment of the existing infrastructure.

2022-2024 - development of a concept implementation strategy.

2025-2027 - planning, budgeting, efficiency forecast.

2028-2030 - implementation and performance evaluation.

Pilot projects are being implemented in Tashkent to introduce the Safe City, Smart Meters, Smart Transport and Smart Medicine, Smart Khokimiyat, and Smart Mahalla systems.

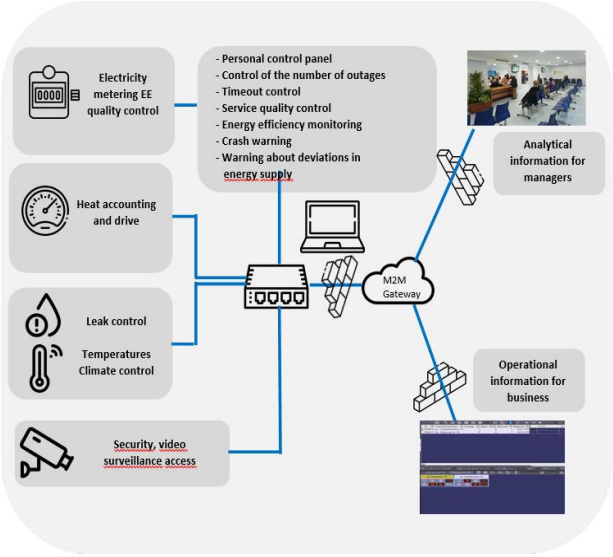

Figure-2. Smart city: Monitoring and forecasting the state of infrastructure

The main problem hindering the introduction of Smart City technologies is the underdeveloped infrastructure of information and communication technologies and the wear and tear and obsolescence of urban infrastructure. All this, the resolution notes, requires the modernization of telecommunications networks and investment in reconstruction[1-11].

The concept includes the implementation of technological solutions in 10 main areas:

"Smart Transport" is an automated traffic control and monitoring system for traffic flows, a system for informing traffic participants about road conditions and public transport schedules, an urban Internet of Things platform and Smart Parking technology that determines the location and distance of free parking spaces, a system of electronic payments for the use of transport and roads, geoinformation technologies and navigation.

"Smart Education" - educational systems based on artificial intelligence with the ability to test students, distance education and e-learning, electronic journals at all levels of education, integration of online and offline methods, adaptive and mobile learning technologies.

"Smart Medicine" is a single platform for biomedical data of patients, maintaining network medical records, remote diagnostics, a system for remote monitoring of human health based on the medical Internet of things and mobile applications,

virtual medical examinations and hospital services, electronic prescriptions, home health care using telemetry, scientific -evidence-based medicine, payment for services based on treatment outcomes, artificial intelligence technologies for analyzing medical data and predicting morbidity.

"Smart Energy System" - a system for data collection and operational dispatch control, emergency shutdown management, a geographic information system, autonomous sensors for monitoring voltage, hybrid batteries, superconductive storage devices, new generation lithium batteries, "smart" systems for measuring and analyzing consumer activity and intelligent systems accounting for energy consumption.

"Smart water supply and sanitation" - a system for accounting for consumers and the volume of services rendered, electronic versions of route maps for water and sewer networks, a system for shutting off water supply in the event of a leak, a system for shutting off heating taps throughout the house in case of an emergency, a system for shutting down pumps in the event of an accident, water-saving technology with the installation of nozzles on taps and sensor mixers.

"Smart housing and communal services" - automation of taking meter readings, a system for transmitting information to user devices about the state of energy supply at home, the introduction of "smart" meters for data exchange between consumers and suppliers of utility resources.

"Smart Construction" is a system for simplifying the construction process and reducing the construction time of facilities, visual modeling of construction processes and new building materials.

"Smart Home" - burglar and fire alarms, access control systems, emergency situations control (leakage of water, gas, power failures), control of indoor and outdoor lighting, energy consumption control, peak load limitation, control of backup power sources, control of home systems through Internet, sensor systems for monitoring heat consumption and air conditioning control.

"Smart Khokimiyat" is a system of interaction between city residents and representatives of executive power, information openness of the city administration, up-to-date strategic planning documentation for the city, electronic identity card, municipal mobile applications, a system for paying local taxes and fees.

"Smart Mahalla" - well-functioning Internet services for calling and paying for taxis, the availability of a network of filling stations for electric vehicles, car sharing services, the availability of data on the labor market and public participation in eliminating the consequences of unauthorized waste disposal.

The program is planned to widely promote the concept of the "Safe City" complex, with street banners, publications in the media and broadcasts on television and radio. In addition, measures will be taken to maintain and improve the position of Uzbekistan in the World's Safest Countries ranking ("The safest countries in the world"), which will serve to increase the tourist and investment attractiveness of the country.

To improve the work of the internal affairs bodies, the organizational structures of all internal affairs bodies of the city and district were strengthened by reducing staff in ministries and regional departments of internal affairs, and a system was created that can effectively influence the situation.

Based on the study of world experience in this area, it can be concluded that modern information and communication technologies are being introduced into the areas of public order and security. The creation of special situational centers is a direct confirmation of this. Special situational centers - a system for monitoring the situation in public places, microdistricts, shopping centers, educational institutions, streets and other densely populated areas through a centralized video surveillance system in the capital and large cities, as well as regions of the country. These projects are very effective in preventing crime, solving crimes, distributing power and resources, and stabilizing the situation in the country.

The solution of applied problems of management activity requires new approaches to information and analytical support and the necessary methodological, software and instrumental, technical means. An effective form

of integration of these tools are situational centers that provide high-quality training, analysis, discussion and adoption of collective management decisions through the integrated use of modern software and hardware for processing and displaying information and are increasingly being used in state and corporate governance bodies as a tool to support management activities.

This shows the widespread introduction of situational centers in the practice of public administration. Today, the system of analytical situational centers of government bodies is rapidly developing: from the situational center under the head of state to the situational centers of ministries and departments[12-27].

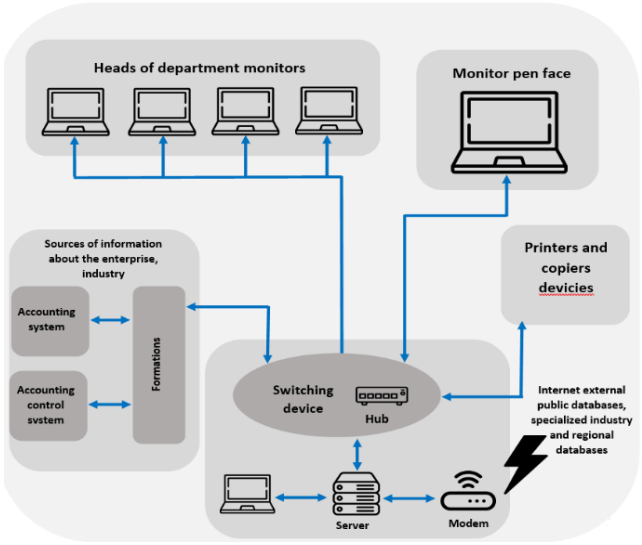

Figure-3. Implementation of situational centers in practice government controlled.

DISCUSSION

The concept of construction and development of the hardware and software complex "safe city".

The relevance of the development of the concept and work program "Safe City", which determine the totality of: functional and technical requirements for hardware and software; normative legal acts and regulations of interdepartmental interaction aimed at counteracting threats to public security, law and order and the safety of the environment, forming together with the existing security systems.

The concept of building and developing the hardware-software complex "Safe City" (hereinafter referred to as the Concept) involves "creating systems for situational analysis of the causes of destabilization of the situation and forecasting existing and potential threats to ensure the safety of the population.

This statement of the problem requires the use of methods of situational management and situational analysis using digital platform tools that provide real-time decision support processes and are based on such key concepts as: event, situation, threat, control.

An integrated system for ensuring the safety of the life of the population should be an integrated automated information and control system, including a set of interacting automated systems of territorial bodies of federal executive bodies, regional executive bodies, local governments and organizations that solve monitoring, forecasting tasks on the territory of the subject of the region and support for decision-making on the prevention and elimination of natural and man-made emergencies, ensuring public safety, law and order and environmental safety.

Figure-4. State Information System hardware and software complex "Safe City".

The main integral indicator is the damage from an emergency in its value terms. However, it is obvious that in the Concept and in the implemented projects there is a bias towards emergency response measures to the detriment of prevention and prevention of emergency situations. This indicates the need to adjust the goal-setting system of the entire project of the Safe City hardware and software complex, which is quite possible if the threat system contains the Concept of a list of indirect threats that are not directly related to the emergency. These include, for example, threats related to:

- aging housing stock, engineering infrastructure;
- decrease in reliability and stability of power supply;
- congestion of the main engineering networks of the sewerage and fields of a filtration;
- shortage of heat supply sources;
- untimely and poor-quality street cleaning;
- Violation of the procedure for the disposal of industrial and household waste;
- impact of external factors on the quality of drinking water;
- non-compliance of the road surface with the safety requirements for road transport, etc[12-27].

RESULTS

Block of targets the main component of a complete system.

To implement a full-fledged goal-setting system, it is necessary to introduce a block of target indicators that reflect measures for the prevention and prevention of an emergency. Firstly, this is an accounting of not only real, but also prevented damage from an emergency (Fig.4).

Secondly, it is taking into account the impact of measures not only to respond to and eliminate the consequences of an emergency, but also the most important processes of prevention and prevention of an emergency.

Thus, the block for calculating the main target indicators is divided into three components: indicators and criteria for preventing emergencies, for responding to an emergency, and for eliminating the consequences of emergencies. In the notation in the figure, the formulas for calculating target indicators look like this:

$$_1 = \sum PU_i(1-RU_i) + \sum EU_i + \sum LU_i,$$
$$_2 = \sum PU_i RU_i + \sum OU_i.$$

If there is a set of TI_i, then planning is carried out by setting their target values in certain time periods into which the planning period is divided:

$$TI_i(t_s) \in \Omega_i(t_s)\, s = 1,\ldots,S,$$

where Ω i(ts) is the target set for TIi at times ts. The target set is defined either as a specific number or as an interval of numbers

Since, by definition, ts are measurable, they are functions of the set of parameters observed and estimated in the process of monitoring pik, k = 1,…, Ki:

$$TI_i = f_i(p_{ik}).$$

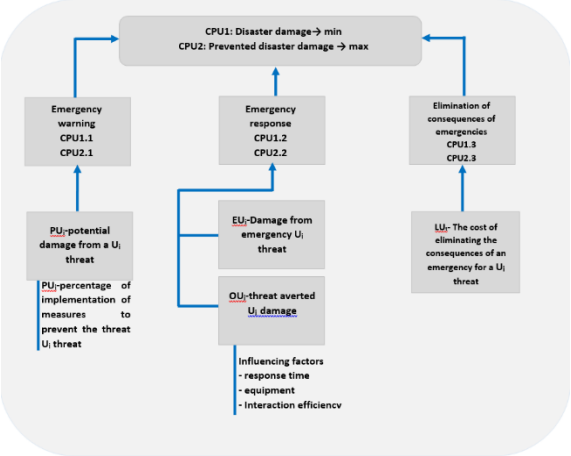

Figure-5. Hierarchy of target indicators of the hardware-software complex "Safe City"

The monitoring subsystem provides for the collection and processing of data coming from monitoring systems in order to ensure forecasting and monitoring of threats of a natural, man-made, biological, social, and environmental nature on the territory of the municipality. The subsystem collects, processes and consolidates data on the current situation in the territories of municipalities, obtained from various sources of information at the municipal and regional levels (monitoring and control systems, terminal devices, duty services, voice and text messages from the population and organizations).

The monitoring subsystem of a typical

hardware and software complex includes the following functional components:

- receiving and processing requests for possible emergencies;
- monitoring of environmental parameters;
- video monitoring and video analysis;
- monitoring of housing and communal services systems;
- fire alarm control;
- vehicle monitoring.

The video surveillance system should be built taking into account the results of scientific research. Locations of video surveillance systems must be coordinated with the territorial authorities.

The video surveillance system should provide video identification, video recognition, video detection and video monitoring.

The video identification subsystem must have an open network architecture with the ability to replace the used software and hardware modules with similar ones in terms of their functions. The architecture of the video identification subsystem must be scalable in terms of the number of registration cameras, server hardware and modules used.

The architecture of the video identification subsystem should provide for the distribution of the computing functions of the system with the allocation of the most resource-intensive operations into separate modules and the centralization of face search functions in accounting and management databases[7- 28].

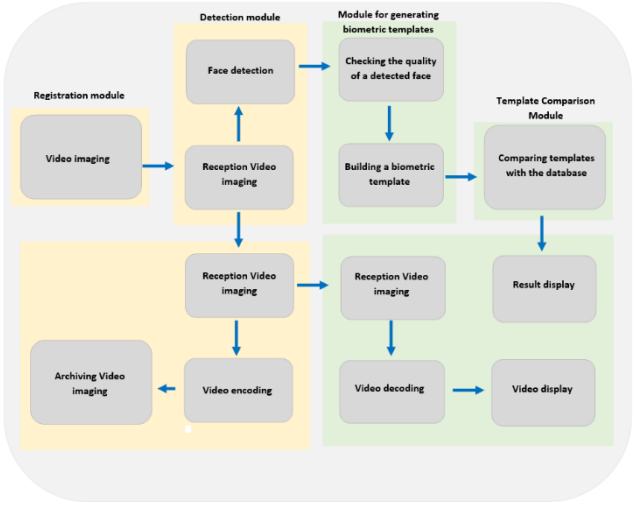

Figure-6. An example of building the architecture of a video identification system.

CONCLUSION

In the conditions of Uzbekistan, the concept of "Smart City" and "Safe City" will have the characteristics of the existing lower and higher authorities, from mahallas to higher authorities in the Republic of Uzbekistan. Therefore, it is desirable to improve these concepts in a more modern way according to the above features. And the following conclusions were made.

1. The concept of construction and development of the hardware and software complex "Safe City" requires the establishment of a mandatory procedure for goal-setting, taking into account the damage caused and prevented, as well as the specification and digitalization of all criteria and indicators.

2. The situational management systems being created should be provided with subsystems for planning and monitoring changes in target indicators related to the prevention of emergency situations and the reduction of damage from them.

3. The lists of controlled events should include threats, the accounting and neutralization of which make it possible to manage the processes of reducing possible damage.

4. It is necessary to regulate the collection of regional statistical data to establish the function of distribution of the magnitude of damage from an emergency.

5. Algorithms for the actions of duty services should be supplemented with a procedure for responding to emergency and crisis situations.

6. The analytical subsystem should provide an analysis of the dynamics of the target indicators and performance criteria of the System specified by the Concept. Technological tools for visualization and management of these indicators are needed for managers of different levels.

7. The video surveillance system must provide video identification, video recognition, video detection and video monitoring.

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