Scanning Smart City in Romania

Third Edition, March, 2019

From Smart City 0.1, to Smart City 1.0

Vegacomp CONSULTING

INNOVATE NETWORKS. RE-DESIGN BUSINESS

TABLE OF CONTENTS

1. SMART CITY MARKET NEWS

The turn-key smart solutions integrator Vegacomp Consulting enters the second year in which it presents, on a semi-annual basis, the scan of Smart City projects in Romania. The third edition brings an even better filtering of the classified projects, new information about the municipalities' local developments and strategies, and for the first time interviews with key players in this emerging market.

"We have an active presence in the Smart City solutions and services market since 2015 and, after the first year when we delivered two snapshots of the Romanian market, 2019 brings the third edition of the report, more balanced, better calibrated and with more direct information from the source - the players who have a decisive influence on the Smart City market. Thus, we will see, in this report, in addition to a leadership change of Smart City verticals, a first series of interviews with representatives of the municipalities that have already taken important steps in this area that will bring us behind the curtain, and an even better image of local development," said Cornel Bărbuț, CEO, Vegacomp Consulting.

Romania is boarding the Smart City train for the first time in 2009, with only a set of concepts and ideas that gradually turn into the first completed projects. The market reaches, at the end of the last year, a value in the range of billions of euros. However, the potential is steadily rising and municipalities are heterogeneously evolving - from true industry leaders, power-engines that push the intelligent city further, to cities where the Smart City concept remains difficult to define and accept, or just a topic of discussion, without concrete actions and projects.

If in the autumn of 2018 we were talking about a Smart City market that exceeded 300 projects in Romania, in March, this year, we reach 330 initiatives either in the project phase, under implementation or already completed.

Alba Iulia, Arad, Avrig, Bacău, Balș, Brașov, Bucharest, Bumbesti-Jiu, Călărași, Cernavodă, Comănești, Constanța, Cluj-Napoca, Deva, Fălticeni, Galați, Giurgiu, Gura Humorului, Hunedoara, Iași, Lugoj, Mangalia, Mizil, Moinești, Odobești, Oradea, Petroșani, Piatra Neamț, Predeal, Reghin, Reșița, Satu Mare, Seini, Sibiu, Slatina, Suceava, Târgoviște, Târgu Jiu, Târgu Mureș, Târgu Neamț, Târnăveni, Timișoara, Tîrgu Bujor, Tulcea and Turda are the cities listed in the report, each with a minimum of one finalised Smart City concepts.

2. METHODOLOGY

The methodology, consistent with the first edition of the report, included the collection of information from public sources that covered the subject over the past year, but this time places more emphasis on first-hand information provided by municipalities, and has a stricter set of criteria for including the listed projects. Also, data provided by companies and obtained through direct interviews with representatives of Smart City solution providers in Romania is used.

The current version, the third edition of the Scanning Smart City in Romania, already collects information on 45 large, medium and small cities in the country that currently list 330 projects either in the planning stage, in progress or already completed Smart City.

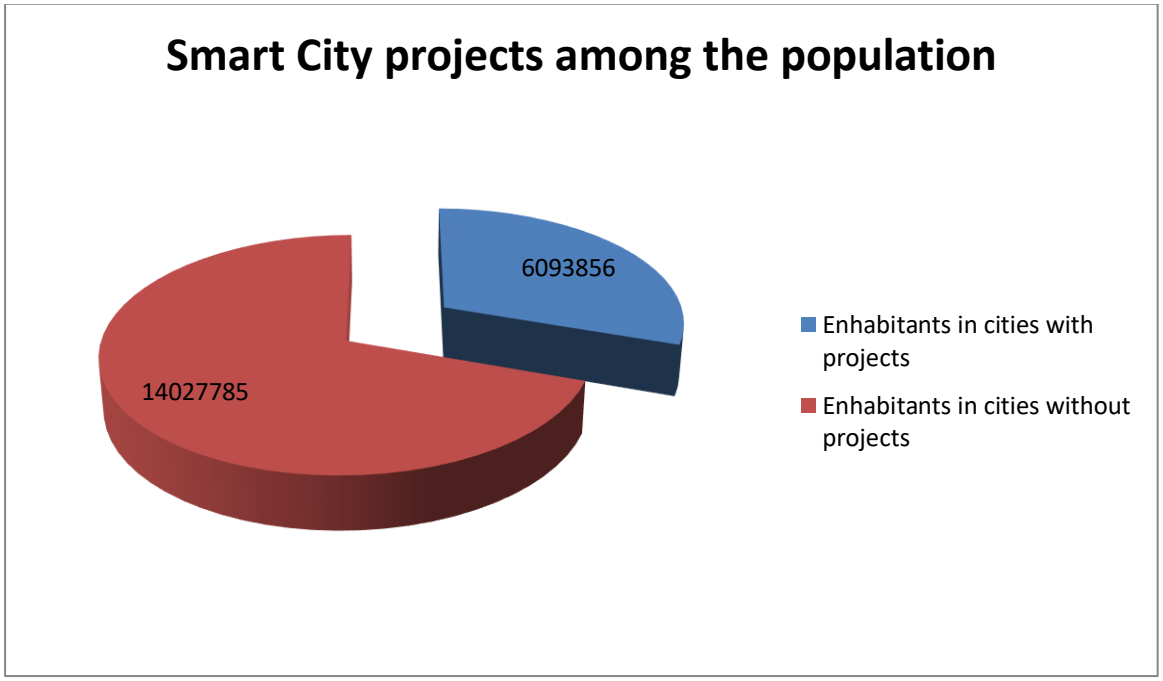
Vegacomp Consulting will periodically update and consolidate all the information in this new version of the document, in order to continually present a proper image of the Smart City developments in Romania.

The identified Smart City projects maintain their listing within the same Smart City Verticals - Smart Economy, Smart Mobility, Smart Environment, Smart People, Smart Living and Smart Governance, in line with the European Comission reports (for more info please visit: https://ec.europa.eu/info/eu-regional-and-urban-development/topics/cities-and-urban-development/city-initiatives/smart-cities_en)

3. CITIES LISTED IN THE REPORT

The list of cities listed in the Smart City report is continuously evolving and includes, at present, municipalities like Alba Iulia, Arad, Avrig, Bacău, Balș, Brașov, Bucharest, Bumbesti-Jiu, Călărași, Cernavodă, Comănești, Constanța, Cluj-Napoca, Deva, Fălticeni, Galați, Giurgiu, Gura Humorului, Hunedoara, Iași, Lugoj, Mangalia, Mizil, Moinești, Odobești, Oradea, Petroșani, Piatra Neamț, Predeal, Reghin, Reșița, Satu Mare, Seini, Sibiu, Slatina, Suceava, Târgoviște, Târgu Jiu, Târgu Mureș, Târgu Neamț, Târnăveni, Timișoara, Tîrgu Bujor, Tulcea and Turda.

"The cities in the list now sum up a total of 6,093,856 residents, almost a third of the population of Romania, according to the latest census. We see, however, a relatively small increase in the adoption of Smart City Solutions among the population that was not previously covered - a natural conclusion, given that the first edition of the report was a measurement from scratch and the next two represented real-time coverage developments. In addition, most new Smart City projects and solutions are developing in areas already covered, where there have already been such projects, and access, as the geographical area does not extend much, remains limited, in terms of progress. We note and appreciate the shift in initiative, from private providers to the City Halls, as well as the concern for data centralization and integration of Smart City Solutions," said Bărbuț.



The top cities, by number of planned, implementing or delivered projects, is: Alba Iulia (103), Brașov (20), Timișoara, Bucharest (19), Arad, Iași (18), Cluj-Napoca (16), Sibiu (13), Oradea, Avrig (12), Constanța, Piatra Neamț (11), Hunedoara, Slatina (6).

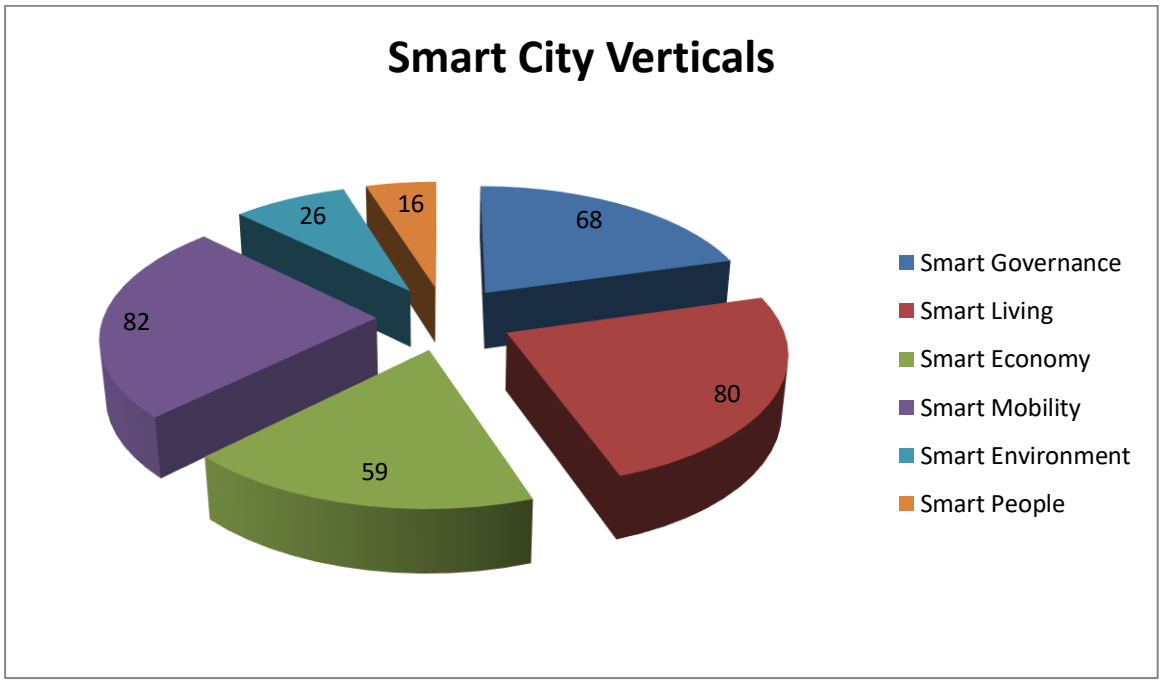
We note that the number of City Hall employees dedicated to Smart City projects and infrastructure is growing, like the examples in Satu Mare or Bucharest's District 4.

4. SMART CITY PROJECTS RANKING BY VERTICALS

Vegacomp Consulting continues to rank Smart City projects according to the verticals recognized by European standards and has developed a national ranking of Smart City verticals, based on the number of projects implemented so far.

The new leader is the Smart Mobility Vertical, covered by 82 projects, closely followed by Smart Living, which enlists 80 projects. The podium is completed by Smart Governance, with 68 projects, and the fourth place goes to Smart Economy with 59 projects. The last two positions are claimed by Smart Environment, with 26 projects and Smart People, with 16 initiatives.

The leading position has passed from Smart Governance in the first edition, with 49 projects, to Smart Living in autumn 2018, with 74 projects and reflected the current needs and desires of the Romanian society and the business environment. A shift from the desire for transparency, de-bureaucracy, to improving living conditions can be seen this spring, through the desire for urban mobility, as a solution to a major problem in Romania - the lack of mobility infrastructure.



5. SMART CITY SOLUTIONS ADOPTED IN ROMANIA, BY VERTICALS

The most popular Smart City solutions identified in Romania and, at the same time, the most commonly used world-wide as well, include: smart street lighting, smart parking, video surveillance and public WiFi, followed on the medium-term by traffic management systems, waste management and its sensor component, such as environmental sensors, used to monitor air quality.

SMART MOBILITY

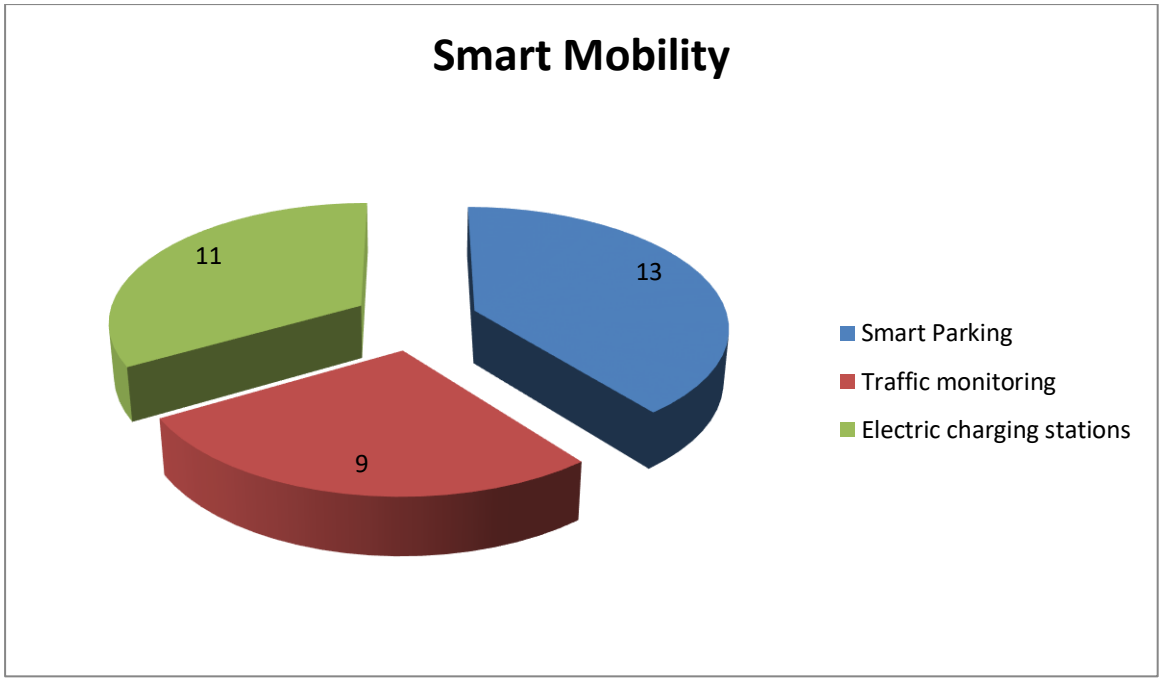
The new leader by adoption of projects grows mainly due to a series of acquisitions or donations of electric cars and electric buses. The Smart Mobility area makes steady steps, in wider areas, in the Romanian cities.

Usually, these projects rely on a more efficient and faster transport, on-the-go connectivity, electric cars that communicate with each other and centralized, or mobile applications that make it easier for the general public to access two or more points of interest.

We identify, this time as well, amongst the various projects, the same solutions that are leading from the point of view of implementation, only this time with smaller differences among them, such as: parking optimization and payment, traffic monitoring, the monitoring and efficiency of the public transport fleet or the car charging services.

We also note the involvement of all four energy distributors in Romania in providing an infrastructure for electric vehicle loading stations: ENEL, which announced at the end of 2018 that it will install 2,500 electric vehicle charging points in Romania over the next four years; EON, which started the first "electric" highway in Romania, Iasi -

Targu Mures, which will be equipped with 40 electric charging stations; CEZ and ELECTRICA.



As Smart Mobility is the leader of the new report, the solution deserves more dedicated space meant to explain the usefulness, benefits and rationale for a growing adoption.

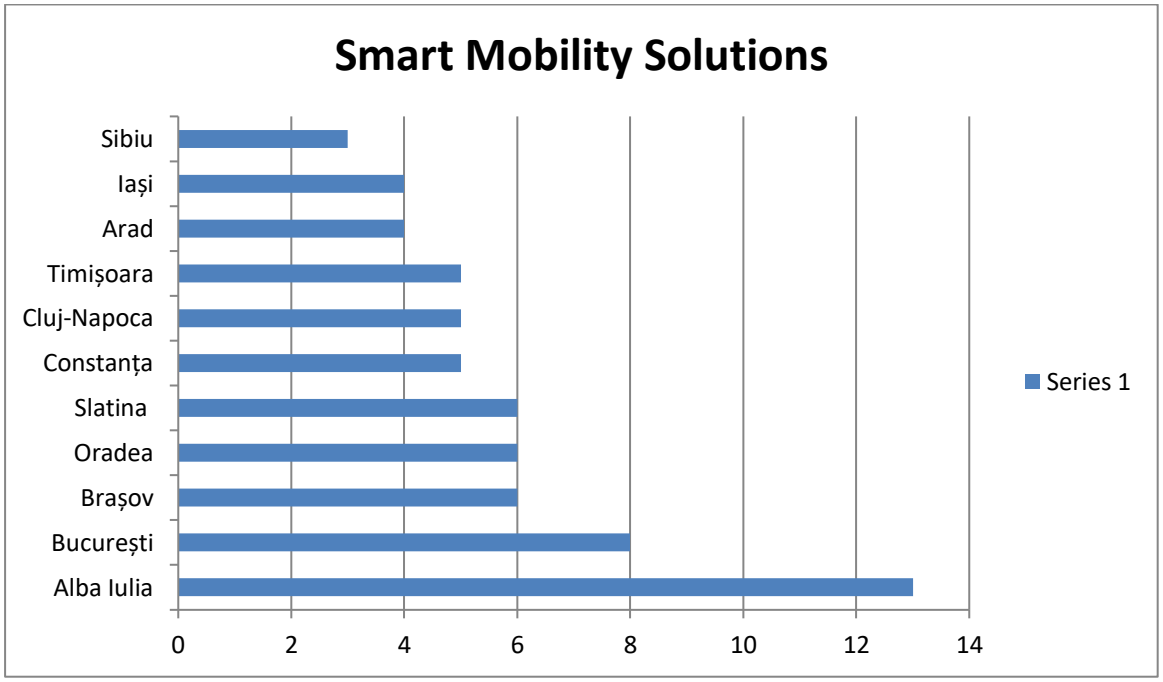
Beyond just being another simple alternative to regular transportation, Smart Mobility is a concept built on the principles of flexibility, efficiency, safety, low environmental impact and integration, regardless of the variety of means of transport.

More and more cities see benefits in the pillars that Smart Mobility is founded upon as a direction and begin to integrate the vertical from the very municipal planning stage, through the optimization and improvement of Urban Mobility Plans, obsolete as format and outdated as an utility. Each city has a limited road structure, and Smart Mobility brings a layer of efficiency through optimization – merging transportation, traffic monitoring, planning and management, alternative transport, sensors and applications designed to measure congestion and provide alternatives.

At the border of smart mobility and eco-efficiency, lies the growing number of initiatives for a "green" transport, found more and more often in Romania. Among the examples, we not only list the charging stations for electric cars, whether public or private, but also the projects ran by some municipalities to migrate from a fleet of fossil fuelled public transport to electric or, in an intermediate step, hybrid.

In an applied approach to Smart Mobility in Romania, we see a high competition between the top cities and their municipalities, at the forefront of the Smart City national industry.

Thus, Alba Iulia lists no less than 13 Smart Mobility solutions, București – 8, Brașov, Oradea și Slatina – 6, Constanța, Cluj-Napoca and Timișoara – 5, Arad and Iași – 4, Sibiu – 3.



The rest of the municipalities in the country have one or two Smart Mobility projects, often at the pilot stage, and a period of measuring the results and efficiency, before continuing, expanding the scale, and covering more the cities with innovations in this vertical.

Of course, there are still many major cities with a large enough population that have not yet embraced the concept, either by lack of funds or by a completely different strategy, where the number one Smart City vertical in Romania still does not have its place.

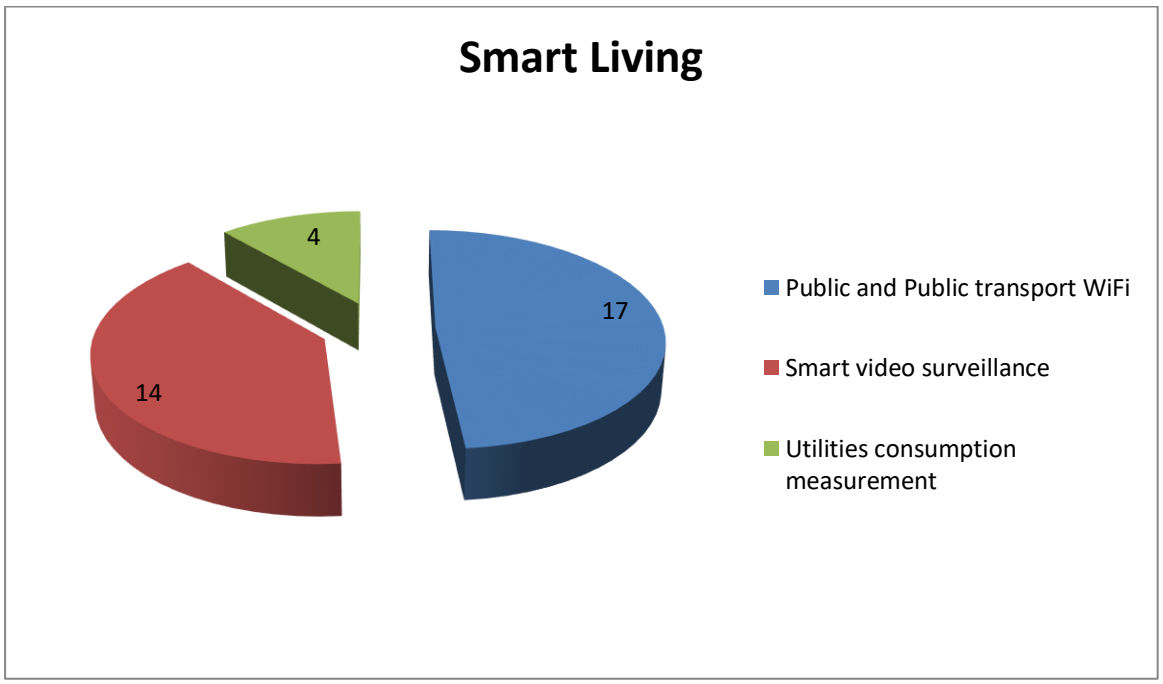
Another remarkable example is the District 4 City Hall in Bucharest, which, with the involvement of an entire department of over 40 employees, has considerably increased the number of parking solutions for the inhabitants. They have inventoried all residential parking places - over 40,000 - and occupying / contracting a parking space is now done only through the mobile application developed by the City Hall, eliminating the papers and written documents from this complicated process. There

are also many other solutions to increase urban mobility that show that something can be done in Romania, in this particular direction.

SMART LIVING

Smart solutions that increase the residents' comfort come down to the second position of the Smart verticals ranking, but at a very small gap versus the leader. Just like in the previous reports, the easiest solution, highly replicable and adaptable, regardless of the size of the local community, remains the public WiFi internet within the city's major points of interest, both outdoor and indoor – the most often adopted implementation of the Smart Living concept in Romania.

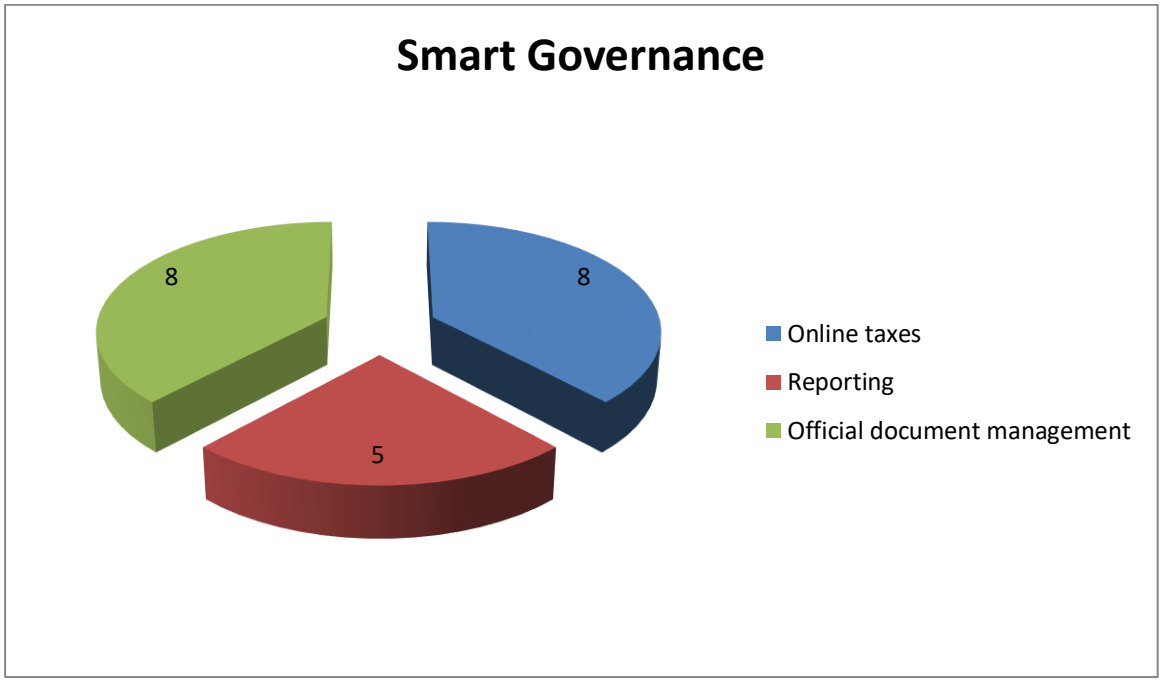
The top also includes a popular version of this solution - the installation of WiFi in the public transport, along with intelligent video surveillance, which is outranking the measurement and management of utility consumption in smart buildings.



SMART GOVERNANCE

Alba-Iulia maintains its leadership at national level and imposes the trends in adoption and moves towards smart governance with more automation, fewer errors and better results for both the public administration and the benefit of the population.

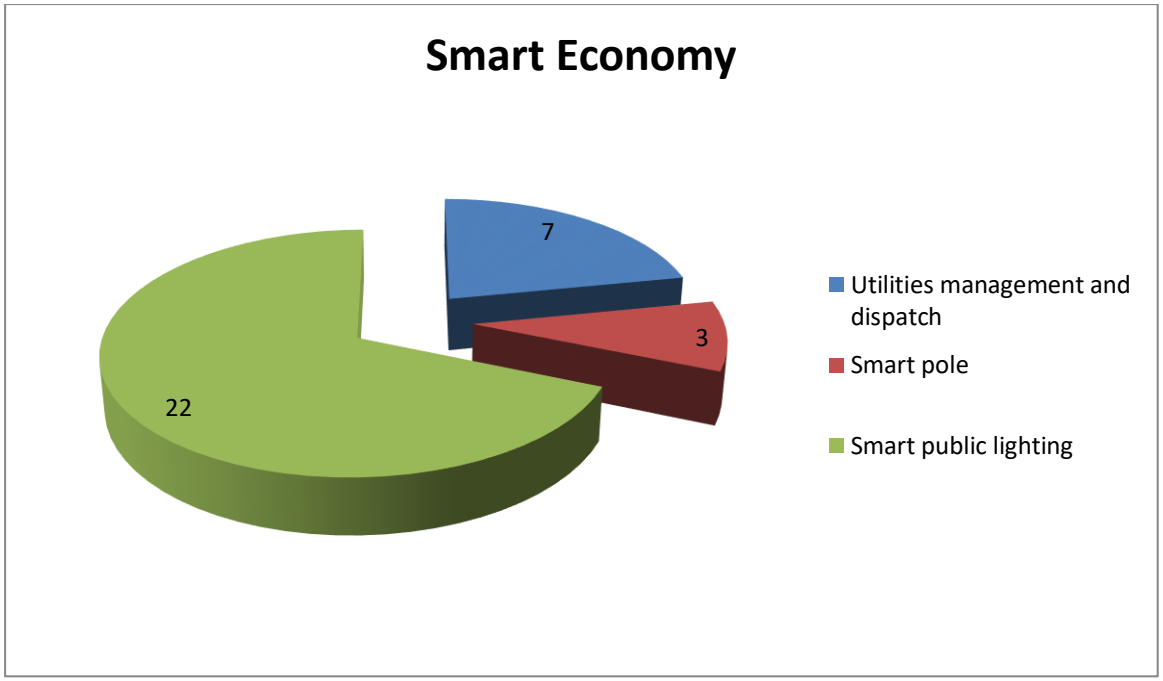
In Romania, the most common projects in this area include, in this third edition of the report: online payment of taxes, interaction with the City Hall and reporting of different situations, as well as the management of official documents such as permits, notifications, certifications.



SMART ECONOMY

With a constant presence in the top 3, in the previous releases, the March 2019 report sees, for the first time, the exit of Smart Economy vertical from the podium. The Smart City solutions designed to simplify residents' lives, but also to generate savings in the medium and long term, together with better resource management, traceability and, last but not least, increased energy efficiency, are adopted by a large part of the municipalities monitored by this report, but at a decreasing pace, compared to the evolution of other monitored verticals.

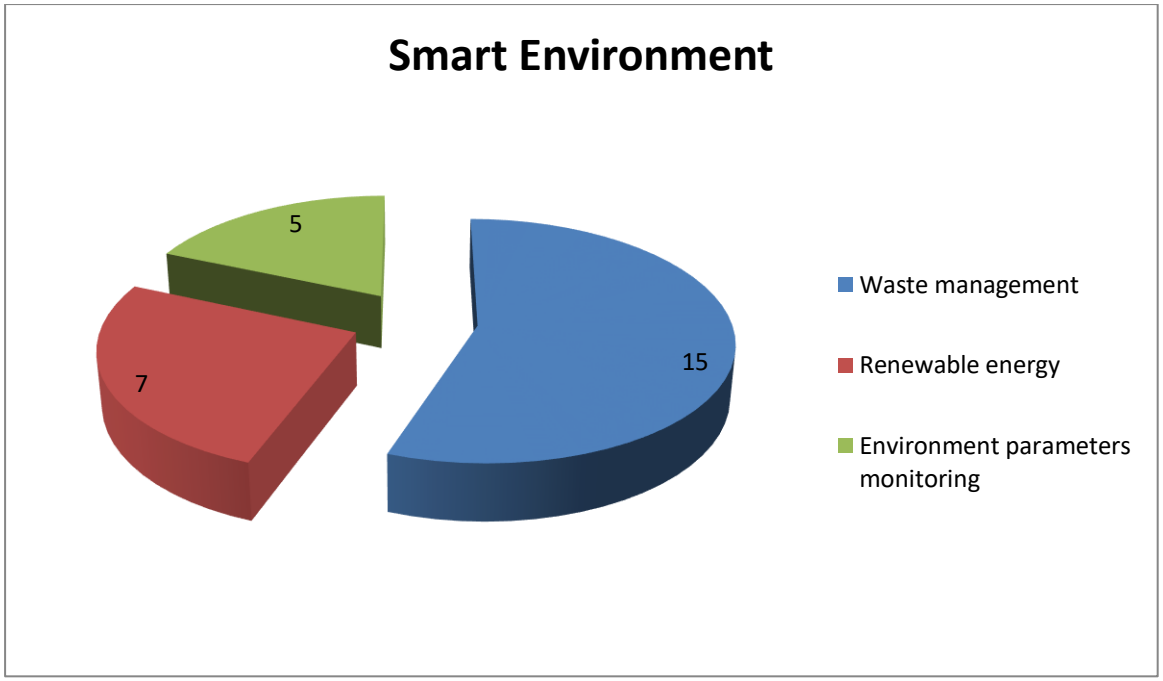
The top led, with a rising gap versus the pursuing solutions, by the intelligent public lighting, adopted on larger or smaller surfaces by most municipalities. Next on the list is dispatching or measuring and reporting systems for utility consumption, with a modest evolution over the past six months, and the podium is closed by the location of intelligent pillars that can either emit WiFi or carry photovoltaic cells, or communicate in real time the readings of the meters installed on them.



SMART ENVIRONMENT

Technology evolves in order to both value and protect the environment, and also to provide the population with more and more intelligent elements in open, public spaces.

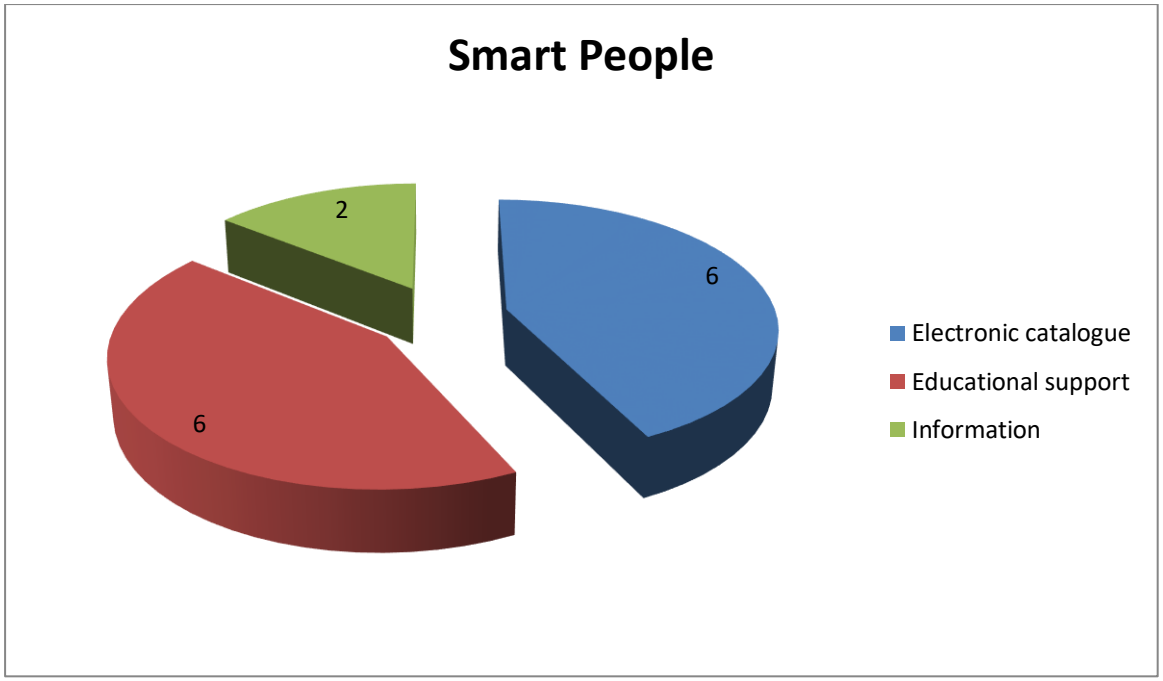
At national level, this type of solutions involves an above average complexity, and adoption is still geographically limited by addressability. We note that solutions for intelligent waste management speed up their growth - even more so than the previous edition of the report, followed by renewable energy and monitoring of various environmental parameters.



SMART PEOPLE

Education and public information is one of the global priorities in the Smart City area, but in Romania it is the third consecutive time that the data collected shows it as the last one by adoption, punctually implemented, often as a pilot project, in educational units that have the resources needed for to innovate in communities more open to new, effective and measurable activities.

Among the evolving areas, although not with a significant enough evolution in the measured period as compared to other verticals, we include information systems for citizens, e-catalogues for pupils and educational support for various topics of knowledge development.


Smart People
2
6
6
Electronic catalogue
Educational support
Information

6. SMART CITY INTERVIEWS

We launch a new chapter of the Smart City Scan, Interviews with key people from local municipalities, who play an essential role in adopting the Smart City solutions. The aim is also to provide an insight into the institutions that are already managing key projects in the Smart City area.

Nicolaie Moldovan, City Manager Alba Iulia

How do you describe the Smart City solutions implemented in Alba Iulia so far?

I would describe them in a single phrase, which applies to the whole Smart City concept: useful. And we can, of course, detail and argue. The Smart City places first the quality of life of its inhabitants. It's a classic and all-encompassing definition. But this is not enough. In order to realize that there is an increase in the quality of life, you need to have some very good evaluations, and evaluations are don't get done by themselves. A city does not turn into a Smart City just on the basis of public gestures, but on the basis of a sustained effort that local governments must do without interruption, if they engage in such an approach. That's why we have begun to answer this question with a simple attribute, but which embraces all that is needed to describe an intelligent solution: its utility in terms of infrastructure, administration, and people.

Within our pilot project, Alba Iulia Smart City, the utility has two evaluation directions: one for us, for the project team and implicitly for the local administration, and one for the community. It may seem a little off from a certain point of view: why should we talk about it in relation to the project team? Because we test, and tests are not done by themselves, but by humans. No Smart City solution is implemented on its own. Maybe we still need 100 years to get to this level. The move to Smart City is made by people, because people decide the usefulness of the solution. For these reasons, we have created and formed a dedicated Smart City team within the Alba Iulia City Hall. It is a realistic reason why we chose testing before making European money purchases, which is all still public money, although some do not know or forgot about it. All we have delivered so far in the pilot phase was education, perspective, vision of the potential of developing a Smart City. We have educated and made a very good technical training for the door that the new European financial exercise for Smart Cities will be open. We know where we stand from the point of view of the quality, scalability and performance of Smart City Solutions. We know how it applies to the thin infrastructure of Romanian cities, we know the potential of each solution and what they need, in order to be better and more suitable for the administration or the community.

What is your strategy, as City Manager, to develop Smart City in Alba Iulia over the next three years?

First, we want to continue what we started. To work by the book, we also plan to develop a Smart City strategy, which is part of a POCA project submitted last month. Important, at the level of a local administrative entity: we think healthily, we think strategically. The basis of the strategy contained in the POCA project mentioned above has been internalized and evaluated within the City Hall of Alba Iulia in our pilot project Alba Iulia Smart City, a base materialized in our initiatives, projects and partnerships, especially with the 45 companies part of the pilot project.

We know where we are going, and this is the most important thing for any administration or business. Our future plans involve the creation of a department within the Alba Iulia City Hall, a team dedicated to Smart City, where we will include, of course, the current dispatch of the municipality along with the legacy of the pilot project, the experience people have built within the City Hall, the relevance of the administration and the city and, most importantly, the data gathered in the pilot phase. Everything we started piloting is to be continued with acquisitions and implementations that bring added benefits to the quality of life for the city's inhabitants.

We have submitted three projects for intelligent public lighting based on the pilot expertise, three urban mobility projects, smart buildings projects and more. Other projects dedicated to intelligent administration are already functional or in preparation or implementation; we communicate effectively with the citizens through a dedicated application and 400 sensors dispersed throughout the city, we continue to digitize the cultural and historical heritage of the city, to expand the development of the tourism and we want to go to the next level of tourism offers, in line with the models already established in the world.

I will not detail each initiative here, but I summarize them in one sentence: our future strategy is to become a Smart City following the model of other cities, in order to contribute with our maximum effort, responsibility and dedication to improving the lives of the Alba Iulia community. We took it too hard for too long. Now we have the technologies that we could not have accessed 20 years ago. The world is evolving, we have to evolve at the same pace. Any city losing the ship will find it very difficult get back onboard.

We will reiterate what we have said in other cases and contexts focused on Smart City: **Romania needs public policies that allow cities to be smartly led**. This needs funding allocated to county-based municipalities, because there are cities that make substantial contributions to the GDP. **Municipalities need funds to set up smart city** management centers, bringing together people from the administration, people from

private companies, specialists, academics, people who are passionate about ICT, volunteers, creative people with time dedicated to the city. We need to set up these centers so that all the data collected from all the sensors can be interpreted by people coming from different environments and fields, including private operators. We also want and wish to set up polytechnic centers with the Smart City specialty, we are counting on higher education in this respect, on the opening of masters lines in the administration of intelligent cities, as well as on other forms of post-graduate studies in order to prepare people for this aspect. Tomorrow's administrations will need them, in order to enable them to step up digitization and development in the natural direction of Smart City.

What projects did you think or plan, that seem impossible for now? Why?

I'll give you some examples: IoT - The Internet of Things. It's a concept without which a city can not become a Smart City. We want to create a network of Smart City Solutions in the city, but for now, the infrastructure, connectivity and high equipment costs are a real impediment. The multitude of data that is collected by dedicated equipment remains inert in many cases. They are extremely important, but very difficult to manage. We need dedicated service companies to develop machine-learning solutions with this data at hand. We will do this with one of the partners with the most Smart City Solutions in our pilot project, namely Orange. Through a Horizon 2020 project, where we signed a partnership with them, we will test the 5G network in Alba Iulia to see how the city-wide concept of IoT works to its true capacity. For us, this is an excellent conversion argument, compared to what we thought about two years ago, when we started the pilot project with Orange.

We also need to promote a friendly fiscal and administrative environment for the technical start-ups. The people who set them up are focused on the development of solutions and are easily lost in the Romanian administrative spider web. Involving local governments in creating a friendly environment for small and medium businesses is crucial in reducing talent emigration towards the major IT fields in Romania.

As for the projects that can not be achieved for now, and I stress that this is only for now, I would point out the difficulties in terms of the interoperability of solution providers and equipment, the lack of specialized people in municipalities, linking the technical potential of solutions and utility for the community, the cost of existing services, the lack of applications that extract data and use them for the purpose of the city, in developing other solutions, to which others can be added.

We are optimistic, we know what we have to do, we continue to do what we have started and we are sure that in a few years, with the potential now available in Romania and with more and more Smart City opportunities, we will be able to align to

the normal direction imposed by the trend of development and evolution of the cities of the world.

7. SMART CITY COMPANIES

Romania currently lists as active the first two worldwide turnkey Smart City solutions providers: Siemens and CISCO.

Along them, the list of companies involved in Smart City projects includes, but is not limited to: Aquatim, Avitech, BCR, Cluj IT - Arxia, Cluj IT - Cloud Soft, Cluj IT - Hyper Media, Cluj IT - Life is Hard, Cluj IT - Optima & Artsoft Consult, Cluj IT - Parking Plus, Cluj IT - Solar Eco Systems, Cluj IT - Trencadis, Dahua, Direct One, Eco Mobilitate, Enel, ETA2U, Euro Jobs, Fast Order, Flash Lighting Services, Industrial Software, IT Center for Community, KMW Services, Luxten, Microsoft, Mobilis, Nova Apaserv, Orange România, Parkomatic, Romstal, Telekom România, Siemens, TPark, UTI, Vegacomp Consulting, White City Code, ZTE.

The last name on the list, ZTE, also marks the first major company involved in the Romanian Smart City market that has, meanwhile, decided to exit the segment.

However, the number of the companies interested by Smart City market in Romania is growing up more and more.

8. SMART CITY EVENTS MARKET

The list of entities identified as involved in the Smart City events management includes, but is not limited to:

- **ARSCM, The Romanian Association for Smart City and Mobility,** leader in Smart City events, with two editions of Smart City Urban Projects (regional Smart City fare), quarterly Smart City Magazine (8th issue), Smart City Caravan (Launched on September 22, 2017, that has reached Bucharest, Brașov, Iași, Piatra Neamț, Alba Iulia, Deva, Craiova, Cluj-Napoca and Satu-Mare), Smart City courses ("Introduction in Smart City", Bucharest, February 21-23, 2018), international events: London (Transport Ticketing Global; Transport&Ticketing Awards; Smart Cities Global Contest), Singapore and Vietnam (Strategie Smart Nation), Belgrade (Smart City Festival 2018), Tunisia (Megara Challenges 2018), the Smart City Industry Awards Gala, 3rd edition.
- **SNSPA** (six yearly editions of Smart Cities Conferences),
- **Smart Cities of Romania** (four yearly editions of "Smart Cities of Romania" expo conferences generally held within the Polytechnics University)
- Different Angle Cluster, with the **Netherlands Embassy in Romania** (two Different City – Smart City editions in Bucharest and one in Constanța)
- **The Diplomat** (three Smart Transformation Forum editions)
- Siemens (Siemens Smart City 2018)
- **AHK România** (six Cities of Tomorrow events by the Romanian-German chamber of commerce)
- **Business Review** (Rising Future: Smart Cities)
- Romanian Association for Promoting Energy Efficiency & **GOVNET** Conferences (five Romanian Energy Efficiency Forum editions)
- GOVNET Conferences (**Future of Urban Mobility in Romania**, SMART Utilities România 2017 - Building Future Cities Infrastructure)
- Jump to Smart- ERomania & IDEATIVA – Smart transportation, Smart traffic
- **Sustainable Cities** – organised by the Embassy of France, 2 editions

There is big number of Smart City events in Romania in the last year and the Smart City market reach a saturation point which it announce a tough competition for the increase of quality and hign content of the Smart City next events.

9. FINANCING SOURCES FOR SMART CITY PROJECTS

The sources of funding for the Smart City projects implemented so far in Romania are:

1. Local budget – for instance, the strategies in Cluj-Napoca, Oradea, Târgu Mures, Sibiu or the Smart City audit in Târnăveni,

2. European funding – LED street lighting projects, the Siemens project for Alba Iulia, acquisition of electrical buses and electric bus charging stations,

3. Private sources (companies – Smart City solutions suppliers) – in Alba Iulia, for example, all the solutions are funded by the participating private companies,

4. Other states – USA, financing the Smart Campus project at the Bucharest Polytechnics University,

5. Banks – for instance, First Bank finances Smart City implementations nd EBRD finances urban mobility project, with Arad for example.

10. CONCLUSIONS

In the second year of Smart City market analysis in Romania, we observe a mix of starting enthusiasm, a relative slowdown of the execution speed and emergence of new projects - signalling that municipalities are waiting for the results of the pilot programs or even having budget constraints in adapting the current streams to the innovation they are only trying at this time - but also a sometimes mistaken attempt to classify any initiative - from a server's certificates to a simple set of cameras - as a Smart City project.

A solid fact is the high level of awareness for the Smart City phenomenon at the level of the municipalities, attained either already through dozens of implemented projects, or through simple declarations of intent or plans for the future.

The market is also beginning to shape the need to theorize the concepts of Smart City and to build a core of specialists within a municipality, with a strong responsibility and decision-making capacity in this segment.

We count 330 Smart City projects implemented at national level – many, compared to previous years, yet very few if we make a global reference - that deliver more benefits to the local communities, solve a set of problems and open the door to future smart developments.

The informal competition for the top Smart City in Romania continues, by number of implementations at the level of the large municipalities, and the need for coherent strategy and structuring, on the medium and long term, is increasingly visible, beyond the punctual, disparate implementations that have dominated the previous years.

Founded in 2004, Vegacomp Consulting, a turn-key integrator, builds on a team of over 25 years of experience in telecommunication, especially in fiber optic networks, in Romania and internationally, and focuses its projects on solutions development that combine telecoms and energy. Vegacomp Consulting brings forth innovative solutions for the development of future networks, generated by its own R&D Department, both in the country and abroad. The company has been focusing its work on LoRa technology for the past two years for Smart Parking and Smart Metering sensors and has been active in the Smart City industry since 2015.

More information is available at www.vegacomp.ro.

Contact: office@vegacomp.ro