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CASE STUDIES

GAIA

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CASE STUDIES

There are in this annex 12 case studies from 4 countries, collected by the project partners:

BULGARIA

1. Street lighting control and management system (**ARISTA**)
2. A full-featured open access publishing platform (**ARPHA**)
3. Early diagnosis solution & connection between health organizations (**LION Technologies**)
4. Solution for real-time managing communication services in smart city (**NETFINITY)**

ROMANIA

5. A cloud platform for involvement of citizens in the city governance (**CityHealth**)
6. Application to monitor available parking spaces in Cluj (**Cluj parking**

SPAIN

7. Platform for service and tourism in Bilbao (**CITYAR**)
8. An app that helps the citizens of a municipality to become active (**Muviment**)
9. Intelligent waste collection systems (**e-Menhir WASTE)**
10. Comprehensive solution for effective noise reduction (

THE NETHERLANDS

11. Respiratory Smart Tech wearable protection mask against air pollution (**AirBliss+®)**
12. Software application for conversion a text into a smart book (**SmartBook)**

BULGARIA

Product name: **ARISTA**

Name in brief: Street lighting control and management system

Company: **ADD-Bulgaria** (https://add-bg.com/en/)

Year 2020

INNOVATION	APPLICABILITY & SUSTAINABILITY	RESULTS
The innovation is a street lighting management system. The core are the individual light controllers that are integrated into or mounted externally on the lamps. They communicate on the radio with each other and send data to the street cassette, where a data concentrator and a power controller is installed. Via GSM / GPRS the hub sends and receives data from the control center. The system makes it possible to turn the external lamp on and off in a timely manner, to adjust the light emitted by each lamp and to provide real-time monitoring and verification of the entire electrical infrastructure.	Remote and accurate measurement of electricity consumption from each street lamp and each outlet of the electrical panels is applied. The controllers automatically send data on the status of the lamp and the status of the electrical infrastructure with all its equipment, according to a set schedule or upon request - various parameters are monitored. This makes it possible to locate and diagnose remotely and on time damaged street lights and/or other equipment, component or element of the infrastructure, as well as to determine any other outage on the infrastructure, which reduces time, labour and costs.	The company is a leader in the provision of smart systems for remote management of electricity meters with number of installed devices - over 1.4 million. Thanks to devices EDC have reduced non-technical losses from 17% to 8%. The results for one city from ARISTA are reduced energy consumption and operating and maintenance costs; improved quality of street lighting; increased security on streets and public areas; reduced CO2 emissions and improved the planning process of the city's budgeting.

Three key DRIVERS	**1. Proper funding** ADD has built a completely new factory equipped with high-tech machines for electronic and plastic production, certified to all international standards. The funding was properly and timely co-financed with 70% by the EU Operational programs.	**2. Staff qualification** The company team has proven experience in providing quality and timely production at a competitive price. Highly qualified specialists design the production stages of each product, determine parameters, repeatability, environment, consumables, tests, and additional accessories.	**3. Production process** High level of production and quality systems. The tracking system enables fast analysis, decision making, and continuous information to the customer about the status of his product. The quality is ensured by the implemented ISO 9001, MID-Module D, and well equipped lab.
Three key BARRIERS	**1. Limited human capital** Overcame by the own training center and various apprentice schemes, and establishment of agreements with the proper schools. Currently over 50 well qualified developers and operators are involved in the product development and processes.	**2. Size of domestic market** Small & competitive local market that operates through public procurements of EDC and municipalities, mainly. The solution was export to other European countries. The fairs, meetings and exhibitions are instruments but also digital marketing was implemented.	**3. Innovation brand** To overcome the brand of a country as a moderate innovator and bad quality industrial market ADD is successfully focused on the uniqueness of the innovations and excellent customer service.
Three key ENABLERS	**1. Excellent market position for smart meters** The gained position and experience with installations of smart electricity meters increases ADD's credibility and opens doors for all other smart technologies.	**2. Investing in R&D** ADD invests heavily in R&D initiatives, in order to keep its innovations constantly evolving and always in line with the top technological tendencies.	**3. Industrial cooperation** Networking and cooperation are actively been used. Examples of successful partnerships are those with Energy Effect - BG, Fornetix - USA and Protasis - Greece.
Three key IMPACTS	**1. New opportunities** The innovation was realized in several BG cities - Dragoman, Roman, Sozopol. This creates a new business opportunity, since it is a good practice for other municipalities.	**2. Better efficiency for cities** It brings better efficiency in the process of maintenance and energy consumption, which ultimately results in higher levels of energy efficiency and expenditure cuts for the municipality.	**3. Multiplication** Once embedded every smart city technology generates a need for others. ADD uses the network of Arista to integrate the smart lighting & metering and infrastructure monitoring.
What's next	The company is planning further use of the already established communication network to develop and implement new smart city solutions. The purpose is to diversify the solutions, but to integrate them into a single smart city platform. This will raise the smart city's needs to look for an integrated approach to selling the hardware and software of the company for the cities' governments. As a result, this and the excellent quality of the products will enlarge the company's geographical markets and its sales.		

Product name: **ARPHA**

Name in brief: A full-featured open access publishing platform

Company: **Pensoft Publishers Ltd., Bulgaria** (https://pensoft.net/)

Year 2020

INNOVATION	APPLICABILITY & SUSTAINABILITY	RESULTS
ARPHA is the world's only system that can accept complex manuscripts (incl. images, in-text, references, cross-referenced citations of figures, tables, literature, supplementary materials, via API. It consists of interconnected, independently functioning journal platforms: 1. Entirely web-based, collaborative authoring, peer-review and publication workflow; 2. Document-based submission, peer-review and publication workflow.	ARPHA is offered as SaaS and allows users to build their own publishing solution to manage and host journals, books, proceedings, institutional documents, conference abstracts. It stands for Authoring, Reviewing, Publishing, Hosting, and Archiving put together all in one place, for the first time. As a problem-oriented tool it can fast track dissemination and, hence, implementation of scientific knowledge to address the green & blue city's challenges.	ARPHA is suitable for a wide range of research outputs, including open access journals, books, conference abstracts, proceedings, institutional documents, and reports. Any combination of those is also available for clients seeking a more holistic solution.

Three key DRIVERS	**1. Personality of the founder** Very known name in semantic publishing, Prof. of ecology at the BG Academy of Sciences (AC) and Ph. D at the Russian AC. Author of OpenBiodiv, one of the first specialized software for biodiversity research (Exeter Software, NY, 1991) and one of the first computerized bibliographies, CARLIT & CARRUS (1993).	**2. First in the market** In 1992, Pensoft became one of the world's leading biodiversity publishers with more than 1,000 books and e-book titles published to date. In 2008 - first open-access journal ZooKeys. In 2010 - the first to implement semantic tagging and enrichment of published articles as a routine editorial practice.	**3. The growing interest in open-access (OA) publishing** It makes the work of scientists more discoverable and visible. OA helps published research to get noticed and get credit. The OA articles are fully indexed, searchable, machine-readable, and available to text and data mining tools over the world.
Three key BARRIERS	**1. Lack of enough specialized staff with software skills** Overcame by investing in the training, motivation, and retention of in-house IT specialists with versatile skills and knowledge in the field of technologically advanced scientific publishing. Providing employment for promising Ph.D. students in biodiversity informatics over the course of their studies through the Marie Curie actions research fellowship program.	**2. Data accessibility, findability and management** Overcame by continuously developing solutions aimed at opening up the research data, freely available and easy to find, integrate, reuse, reproduce, cite and build on. Using Linked Open Data in the publications to cross-link a wide range of data types from across sources, so that studies are easier to reuse, reproduce and elaborate on.	**3. High global competition level (old & large publishers)** Overcame by the policy of providing diverse and often unique technological services and software solutions offered at reasonable prices. The clients can always rely on a highly personalised and flexible attitude. Being launched by scientists, the company is well-positioned to figure and address the needs of clients.
Three key ENABLERS	**1. Continuous innovation** It launched the first-ever, end-to-end, online, XML-based publishing, that supports the full life cycle of manuscripts, from authoring to peer-review, publication, dissemination (2013). Initially implemented at Biodiversity Data Journal, the Writing Tool is now upgraded to ARPHA.	2. **The operational model** ARPHA integrates the pre-submission, post-publication review & consolidation into a single editor's version, import / download of small data into / from article text, semantic enhancement mark-up, automated dissemination, and integration with ZENODO.	**3. The value of the knowledge is growing** Open access makes the knowledge closer to researchers, public, decision-makers. The immediate and unrestricted access to the latest research creates an equitable system of knowledge that is open to citizen.
Three key IMPACTS	**1. Circular city economy** The easy access to the latest researches relevant to life-pressing challenges, such as air pollution, health hazards, natural disasters, makes possible improvements of the quality of life in cities.	**2. Level of collaboration** By making researches accessible to large community, it prompts collaborative and inclusive efforts across disciplines and professional fields, incl. on smart city level.	**3. Accumulated knowledge** More than 11,500 open access articles in a number of academic journals, hosted on ARPHA, contribute to the state of knowledge about cities and societies.
What's next	The accent of the ARPHA platform in the near future will be on studying needs for new services and tools and exploring niches within the scholarly publishing landscape for finding solutions, technologies, and practices.		

Product name: **LION Technologies**

Name in brief: Early diagnosis solution & connection between health organizations

Year 2020

Company: **Lion technology, Bulgaria**

INNOVATION	APPLICABILITY & SUSTAINABILITY	RESULTS
The innovation is in the stage of the development TRL2/3. Apart from the possibility to check the availabilities of specialists who are properly needed by the patients in the right moment an important advantage of the product is the feature to reminder about the preventive examinations and reference the users to these specialists. The product provides monitoring over the whole epidemical situation.	The product is an example for a software application that can make a great impact on every one epidemical situation with giving possibility for every one patient to reach in time the needed specialist, what usually is not a case and often leads to serious complications and spread of the epidemy.	The product is to be helping the early diagnosis of many dangerous diseases and stimulate the prevention of all, from children to the elderly to have easy access to the necessary medical care or information for proper specialists.

Three key DRIVERS	**1. Business idea with cause** Although the product is marketable it is a business with impact what makes it sustainable. It leverages on the basic need of human to be informed properly and timely for its for health through easy-to-use virtual access to diagnostics, prevention, data, advise. It is extremely useful in times of epidemics.	**2. Mature environment** The product appears in a time when the ecosystem is already favorable for e-healthcare, e-services and deep-tech startups. Smart devices and solutions are on focus by investors and the additional impact of the epidemy carried out additional value of the solution with chances for a next level of development.	**3. Used technology** The nature of the used technology for development of this app allows the achievement of the high level of customization, Big Data and Intelligent DB Management and Cloud Data masking respecting the personal data protection**.**
Three key BARRIERS	**1. Financial support** Limited financial resources leading to under developed schemes for financial support. The investors support projects and startups with already proven and validated MVP generating some revenue which prevents from further upgrade the solution with the current level of development.	**2. Supporting schemes** Not well-developed supporting schemes on national and regional level for social entrepreneurship. Although a support for deeptech startups is declared as a priority in reality such businesses rather rely on the interest of business angels and existence of EU initiatives and programs.	**3. Regulation** The market for such novel solutions is not well regulated and there is a level of uncertainty directly related to pandemic situations.
Three key ENABLERS	**1. Science & technology** Using artificial intelligence in information technology, processed in a way that can easily reach people. The advantages of the used technologies play role for improvement and upgrade to constantly adapt and meet the demand and needs.	**2. Societal importance** The importance of the solution for the target groups is very visible and understandable not only by individuals but also by society at all. The product may become one of the enabling factors for the healthcare system. This will further push the development of the solution.	**3. Smart urban process** The rise of the tele-medicine and e-healthcare is an enabler for the digital transition of the cities that enhance the smart city marketplace. This is a demand pushing factor for this solution.
Three key IMPACTS	**1. A healthier society** The most important impact is reducing the mortality in a country and/or city through facilitating the process of protecting the health of the population (people, citizen).	**2. Enhanced collaboration** The societal impact and inclusion of healthcare as a key topic for the smart city roadmap supports collaboration within the value chain between many market players.	**3. Healthcare management** The product is result of design thinking of young entrepreneurs. It supports an important element of the managing healthcare increasing its efficiency and efficacy.
What's next	Next steps include elaboration and testing of a prototype and applying measures for the constant improvements alongside trying to apply a machine learning element in the process of data management.		

Product name: **NETFINITY**

Name in brief: Solution for real-time managing communication services in smart city

Company: **Netfinity city, Bulgaria**

Year 2020

INNOVATION	APPLICABILITY & SUSTAINABILITY	RESULTS
This innovation helps connect the employees of an organization (city admin) and their customers quickly and easily, with the possibility of monitoring. The most interesting part is the integration of telephone services with the information system, automating many processes. The product achieved TRL3.	The applicability of this innovation for the city is related to increasing its productivity and improving the quality of communication services. Its sustainability in its future development has potential due to the demand between both individuals and business partners.	The most significant result of the implementation of such software is easier access to customer feedback, regardless of what it is. This leads to higher satisfaction of people and, accordingly, easier access to this type of service.

Three key DRIVERS	**1. Business model and innovation** Developed successful innovative business idea with proven impact and application, marketable product/service and visible and increasing impact for the city and the entrepreneurs.	**2. Business impact** Improvement in the business process through flexibility, increased capacity, cost reduction. This increases the level of satisfaction of end users and customers which improves the business ecosystem and development.	**3. Better access** Easy and/or well-organized access to existing and new target groups of beneficiaries and end users/clients. This increases the number of uses which leads to higher revenue, profit and satisfaction of citizen. It improves the connectivity and access to problem-oriented data.
Three key BARRIERS	**1. Financial resources** Limited financial resources leading to under developed schemes for financial support. When the project and solutions are under development the financing is scarce acting as a barrier for development of the MVP for validation.	**2. Governmental funding** Not enough and diverse smart business models for funding and different kinds of supporting schemes on national and regional level for smart city business projects.	**3. Ecosystem support** The business support structures (organizations, accelerators, etc.) are still underdeveloped. The current ecosystem support entrepreneurship in general and finding specific partners is difficult for smart city applications.
Three key ENABLERS	**1. Collaboration** Strong business model with opportunities for diverse partnership with other startups, scaleups, SMEs, large corporations. The service allows collaboration with telecoms and other strong businesses which are already in growth.	**2. Productivity and accessibility** Using current telephone services and turning them into information services increases the productivity of both business and smart city. The need is beyond the individual need and covers the social aspect which increase the social value of the business.	**3. Public-private partnerships** The aspiration of SMEs for more business processes with the possibility of monitoring and feedback from the customers. Partnership with public authorities and smart city solution providers.
Three key IMPACTS	**1. Business impact** The business model used for this novel solution can be used to support and accelerate the implementation and commercialization process.	**2. Better smart city services** The quality of this service in the city is improving, not only because it optimizes the services that people can use, but also makes the work process easier.	**3. Market for smart city business** The supply chain for the innovation is completely online, which allows to influence the improvement of the market position at the level of a city.
What's next	Next steps include more testing and applying measures for constant improvements. The plan includes also the dissemination and improvement of technology on a larger scale, expanding the scope of the project in order to meet the needs of our customers and scaling up.		

ROMANIA

CITYHEALTH

Product name: **CityHealth**

Name in brief: A cloud platform for involvement of citizens in the city governance

Company: **Life is Hard SA, Romania** (https://www.lifeishard.ro/)

Year 2020

INNOVATION	APPLICABILITY & SUSTAINABILITY	RESULTS
CityHealth is a solution that support the communication between the city and citizens in real time. It is a holistic approach for a transparent public administration and co-creative ecosystem, where citizens, local companies and the municipality work together directly from desktops or mobile phones. Being users of this cloud platform, the citizens become part of the decision-making process. It is flexible and is adoptable to the needs of the communities. Through the assessments on this platform the local authorities receive a clearer picture of people's views on city challenges.	The cloud platform is usable and adoptable in any community that embraces a transparent collaboration between public administration and citizens. As the app is available on a cloud platform with the help of a smart mobile device, it is sustainable and easily approachable for all ecosystems. The users create step-by-step connected communities, information exchange and active involvement in community welfare. People can report various problems, supporting their solution and providing feedback on the solutions applied.	The outcome is that the platform brings a community closer to its public administration thus creating a long-lasting fruitful collaboration for the wellbeing of both citizens and the city itself as it includes real time updates on traffic, various alerts, and it also includes citizens in the decision-making process of the public administration. For the two years after implementation the platform has 20000 users from 40 societies. The result - improved quality of life in cities, intelligent administration in place, data visualization.

Three key DRIVERS	**1. Responding to the needs** The solution is the result of the efforts made by Life is Hard SA to create an app that embodies a smart ecosystem of connected solutions. It was developed entirely as a response to the identified needs of a local community.	**2. Communication needs of public administration with its citizens** The app responds to the needs of good collaboration between public administration and citizens. It builds a bridge to facilitate the decision-making processes within a community in a manner that is accessible to both involved parties.	**3. Bringing citizens together** The role of the public administration is to adopt and quickly adjust the platform to its governance needs while keeping in mind the communication gap it needs to fill with its citizens.
Three key BARRIERS	**1. Adopting the platform** The app is fully developed and functional and is currently used in over 25 communities both nationally and internationally. The challenge is to have it used by as many citizens in a community, thus helping spread the word regarding certain matters in a quicker manner.	**2. Knowing other communities** While adapting the platform to each community individually may come as a challenge, CityHealth is user friendly and easy to customize. Having it respond to the communication needs of a community is vital from the get go to ensure a long time use of the app.	**3. Maintain the interest of users** The bigger the number of users in a community, the longer the app will be used and be able to respond to its communication needs and decision-making process.
Three key ENABLERS	**1. Constant interest in the community needs** The platform is meant for large scale use to ensure a transparent collaboration between public administration and citizens.	**2. Support from the Cluster** The Cluster supports the platform by endorsing it to partners and communities at local, regional, national and international level.	**3. Multiple positive long-term effects** Citizens can vote on reported issues that affect them in their daily activities, so that local authorities can prioritize solving the most important issues according to their needs.
Three key IMPACTS	**1. Allow an easier collaboration** The citizens can actively report and get notifications about various issues within the community, for example: road conditions, broken lighting systems, traffic lights not working, waste disposal, elements that can endanger the health and integrity of citizens, etc.	**2. Better decision-making process.** It is an example of good practice in terms of a quick and productive response to the needs of community the company is part of and later replicating it in other communities as well. It is actively used in over 40 localities in Romania and abroad.	**3. The reduction of paperwork in public institutions.** Citizens are notified online about the outcome of their complaints, about events or situations that affect their daily activities such as roadblocks, street closures, infrastructure works and even emergencies.
What's next	Having the platform adopted on a large scale by as many communities as possible.		

Product name: **Cluj parking**

Name in brief: Application to monitor available parking spaces in Cluj

Year 2020

Company: **AROBS Transilvania Software, Romania** (www.arobs.com)

INNOVATION	APPLICABILITY & SUSTAINABILITY	RESULTS
Cluj Parking is the only and most accessible possibility to check the availability of parking spaces in Cluj-Napoca. With an easy-to-use interface, the application is also available for the iOS operating system.	The role of the application is to monitor all available parking spaces in the center of Cluj-Napoca under the public institution management.	It helps to avoid congestion and overcrowding of central parking lots. It helps to streamline and decongest traffic in the city.

Three key DRIVERS	**1. Basic human need** An intelligent parking assistance application, which provides information, but also guides drivers to the nearest parking space. The need for availability of parking is essential and increasing as many people buy cars and prefer individual transport under the conditions of COVID-19. This supports the development of the business and increase the demand for the solution.	**2. Business opportunities** The needs of citizens to avoid crowded parking lots and the need to simplify the search of free parking spaces in the city. The convenience of the application makes it preferable and will lead to revenue streams. The features of the app are very user-friendly and this leads to the use by more users.	**3. Better public services** The application helps public institutions to update in real time the availability of parking spaces in certain locations. The solution has a high impact for the public authorities and can help them reduce costs and keep better monitoring of the parking and the traffic which will further help them make decisions, improvements, and innovation turning Cluj-Napoca into a smart city.
Three key BARRIERS	**1. Complex technology** The complexity of technology, which could be the main barrier. The availability of cross-functionalities, information and involvement of different stakeholders makes the model complex and difficult to predict and prevent from errors, pitfalls and wrong information.	**2. Compatibility of platforms** Errors in the communication between the platforms of the institutions and the system for recognizing the registration number. The synchronization and technical development of platforms from different institutions is complex and could lead to system errors and difficulties.	**3. Openness of administration** Openness from public administration in adopting the solution. Innovation takes time and resources but when it is related to the collaboration with public institutions and authorities the process could be slower and longer. Adaptations requires very structured approach with piloting and testing.
Three key ENABLERS	**1. Variety of services** Having the platform adopted in numerous parking spaces. The modifications and types of the parking spaces require customization and adaptation. The process allows different business models, configurations, service and customization. This means evolvement of the solution and new opportunities for business.	**2. Better customer service** The need of divers of knowing the available parking spaces in the city. The solution meets a need which is essential and here to stay. The expectations of customers are changing and the development of technology will further push and support the solution.	**3. Partnerships** Openness by innovative business to partner with AROBS. The solution involves various stakeholders including business, public sector, non-profit organisations. The solutions allow modifications and collaboration with wide range of partners and organisations which drives innovation for all parties.
Three key IMPACTS	**1. Quality of life** Improving the quality of daily life of the citizens, but also of the experience of city visitors. This will attract visitors for tourism and/or business travelling by car and exploring the city.	**2. Reduction of waiting time** Reducing the time spent in search for a parking space. This increases the utilization of the parking spots, too and leads to reduction of costs, emissions, etc. Time is always limited and parking often is a necessity and barrier.	**3. Sustainability** Reduction of harmful emissions when looking for a parking space. The positive impact of the reduction of emissions contributes to the sustainability goals of the city and the improvement of the environment and the air.
What's next	Marking on the map the dedicated parking spaces for people with disabilities, so that they can find an extremely easy parking space.		

SPAIN

Product name: **CITYAR**

Name in brief: Platform for service and tourism in Bilbao

Company: **City of Bilbao** (Developer Ángel López)

Year 2020

INNOVATION	APPLICABILITY & SUSTAINABILITY	RESULTS
CITYAR is an app that uses machine learning to offer a personalized and contextualized service to tourists and people looking for leisure in Bilbao. It is a formula of proximity for those who are looking for experiences in the city. Solution offers integration in a single platform of city's leisure offers, today dispersed. It adds a recommendation system to personalize the experience according to the interests of the visitors.	The promotion of tourism is one of the axes of development of Bilbao as a city of services. The increase in the number of visitors must be accompanied by solutions that give visibility to the services. Partnership with the leisure offer will keep information updated and integration with booking systems will assure interest for tourist and usability of application.	Objective for the city is increasing the time tourists stay in the city and the number of leisure services consumed by visitors. Results from this innovative solution are better knowledge of the leisure offer because of accessibility information for visitors since the very moment of arrival, usually through the airport. Better knowledge and easy access to booking should result into average expenditure made increase by the tourist and improve city's leisure business model.

Three key DRIVERS	**1. Local authorities' support** The interest of the local administration in promoting Bilbao and Bizkaia as a tourist destination explain their support to this innovation. Tourism takes off in Bilbao some years ago and strategy to promote it create an interesting window opportunity.	**2. Software development skills** The entrepreneurs have a remarkable experience as software developers and knowledge of the technological environment also.	**3. Potential customers increasing numbers** The growing number of tourists arriving Bilbao helps to increase leisure services offer so as the initiative benefits from both offer and demand growing blowing foreseeable demand for the application
Three key BARRIERS	**1. Approach to market** Although vast experience in information technologies, entrepreneurs lack of marketing skills and limited experience in partnership development which should be a great challenge for the startup.	**2. Fragmented service environment** Leisure service ecosystems is highly disaggregated in the form of micro-SMEs. It's a great challenge access to them for partnership and get information updated.	**3. Communication plan and marketing** Need for financial resources to cover the cost of deploying the communication application to give visibility among the visitors of the city is one of the main issues of the startup.
Three key ENABLERS	**1. Local authority's support** As well as driver, growing tourism and local authorities interested in promotion of Bilbao tourism has assured financial and personal support from the council's innovation services. This enables funds for prototype development and help for leisure ecosystem access and marketing in tourist gates to the city.	**2. Local authority's support** Technological competences and skills of the people who have developed the prototype have allowed short time to market, robustness of solution and assure interoperability and quickly adapt to new insights once deployed.	**3. Real need for leisure information online aggregated** The need for the tourist office of the city council to promote visitors to the city with innovative technological proposals and inform open an interested opportunity for these services as there is no alternative nowadays.
Three key IMPACTS	**1. Enhance customer experience** It will provide visitors with information and access to the city's leisure services updated and in a comprehensive way. Destination selection depends more and more from customization of leisure experiences for tourist … so a platform integrating whole offer will enhance customer experience.	**2. Visibility for leisure ecosystems** Leisure service offer is usually disaggregated and not easily accessible. Companies will grow in visibility and easily access for visitor to boo. From the very moment of the arrival to the airport, leisure service is offered context adapted.	**3. Increase revenues for leisure ecosystems** Intermediating between visitors and service companies, through booking service, and increasing turnover of companies will allow us to grow both in commissions and in advertising revenues in a virtuous circle.
What's next	Due to the coronavirus pandemic, it has not been possible to deploy the solution at Easter as planned (neither in summer). Plans to get to market have been postponed but entrepreneurs are taking advantage of this time to increase the number of services fully integrated into our platform and beginning ecosystem approach for partnership. Besides, entrepreneurs are working their managerial skills with support from the services for entrepreneur support of Bilbao authorities.		

RUNNEA

Product name: **Muviment**

Name in brief: An app that helps the citizens of a municipality to become active

Company: **Runnea & TECH Joint venture** (www.muviment.com)

Year 2020

INNOVATION	APPLICABILITY & SUSTAINABILITY	RESULTS
Muviment is the simplest way to exercise the body, promote health and avoid sedentarism. As physical activity is health, it helps to activate the citizenship of the municipality. Muviment is an app that uses machine learning and AI capabilities to offer a personalized service for physical activity. It is a formula to digitize the health promotion services of the City Council.	Promotion of health and quality of life is one of the most remarkable aspects in Smartcities. Technology will be a key element on this path towards the "Healthy City". It helps to plan the activity, to activate the body and to improve the nutrition of each citizen. It suggests personalized exercise routines so that each user marks his or her own rhythm and helps to improve physical facilitating control of the evolution of users' state.	OMS considers physical activity essential to reduce the risk in many diseases. This added to the increase in health spending of the states makes our proposal very attractive. Everyone benefits from a healthier way of life, health and assistance systems, commerce and leisure services, and above all, the ordinary citizen. Muviment helps to improve nutritional habits of citizens by proposing customized nutritional plans designed by professional nutritionists.

Three key DRIVERS	**1. Scalability** It is a customized SAAS solution for each client powered by artificial intelligence. However, solution is 95% similar in each case. This allows scalability, since elements that make up the solution are more easily standardized and developed. This is even true for an international deployment.	**2. Previous experience** Innovators have previous TECH experience in the field of Smart Cities. They are currently working with more than 50 cities and have also offered a free basic solution in 20 cities. Their knowledge of municipalities procedures and the network already established will make easy the process of communication and partnership.	**3. Business model** It is offered within the framework of a cheap price and the continuity will depend on the number of users. It has no main entry barrier for a municipality. It can be launched with a small investment according to the number of users, justify a greater expenditure in the accompaniment of the citizen's health. Business model is based on multiple cities adoption of the app.
Three key BARRIERS	**1. Lack of digital culture** Main barrier, not only for this initiative but for a Smart city deployment, is the lack of digital culture in our municipalities. Small cities do not have the economic, technical and human resources or the technological skills in their municipalities to drive their digital transformation.	**2. Difficulty in the management of personal data** The necessary confidentiality and privacy of citizens' data and compliance with the recent RGPD is a headache in the development of the process architecture and the deployment and maintenance of the application.	**3. Availability of economic resources of the municipalities** The COVID crisis will limit the investment capacity of cities. The need to increase spending in support of the economy and employment may reduce the investment budget in areas such as the digital transformation of health. The health budgets will decrease so that the marketing and deployment plans will slow down.
Three key ENABLERS	**1. Healthy city as aspiration** The concept of Healthy City is actually one of the main drivers in the city. Welfare is based on longer and healthy life. Health promotion and body care have become a key issue of modern life not only for citizens but for administration also.	**2. Complementing the knowledge** The joint venture between Runnea and TECH. If partnership is important in every initiative, it is even more in smart city tech solutions. Combining tech skills with knowledge of the sport is key to deploy such solution.	**3. COVID crisis as opportunity** COVID crisis has emphasized on Digital Fitness solutions. The confinement scenario has highlighted the need for custom tailored physical exercise and has awakened the interest of municipalities in scalable healthy solutions for all citizens.
Three key IMPACTS	**1. Diversify portfolio of solutions** Mainly it will allow TECH to diversify its portfolio of solutions for the city. A health and well-being solution allows to complete the offer of smart services generating an opportunity of cross- selling to TECH.	**2. Health and wellbeing** Being the quality of life a key element in urban development, health is the great forgotten in the Smart City paradigm. Greatest efforts have been made in transportation, lighting, security, and citizen participation, but healthy living has hardly been considered.	**3. Health expenditure contention** Beside health improvement, a reduction of social and health spending will be achieved. An aging society will demand increased health care spending. Promotion of healthy living habits in terms of exercise and diet can allow the administration control this increasing health spending.
What's next	Work on some aspects that need to be improved in the application. Delve into AI capabilities and customization. Integrating the urban space within the APP are the next steps.		

E-MENHIR

Product name: **e-Menhir WASTE**

Name in brief: Intelligent waste collection systems

Year 2020

Company: **e-Menhir, Spain** (https://www.emenhir.com/en/)

INNOVATION	APPLICABILITY & SUSTAINABILITY	RESULTS
e-Menhir WASTE is a new waste collection system that has released a new way of monitoring waste containers and dynamic route calculation. It s based on smart technology with ability to signal when and where the waste should be collected.	e-Menhir WASTE is right now working in Spain, Portugal and Germany and allows the city to optimize waste collection and helps cities to generate less CO2 emission to atmosphere.	The main impact is related to the re-optimization of waste containers distribution with near 30 % of less containers used for the collection. The collection trucks have reduced 40% with the consequent CO2 reduction.

Three key DRIVERS	**1. Better waste collection** Public institutions gain a lot of benefits as it is very difficult to maintain and control the waste management. City administration constantly looks for new and better ways of management of waste collection and without requirements it wouldn't be possible to reach the goal for sustainability.	**2. Development of smart city** By implementing such services and activities the city council improves its position and evolvement as a smart city. The solutions provide opportunities for business, better serving the citizens and higher smart city capacity.	**3. Cost reduction** The solution allows reduction of nearly 30% of the used containers and the time and resources for collection of waste. In addition, it improves the recycling opportunities and collection of waste. The necessary resources are reduced and thus the costs are lower.
Three key BARRIERS	**1. Technology competences** The knowledge of people about the use of advanced technology is a great barrier. This requires more and better preparation and training of the service providers, the city administration and all parties involved.	**2. Finances** The implementation of the solutions requires change in the budget and additional upfront funding which is often difficult for municipalities. This requires more time and longer period for planning before implementation.	**3. Flexibility for innovation** Innovation process within public administration and municipality takes time, preparation of staff, resources and this requires longer negotiations, preparation, and implementation. It includes also the right partnerships and decision makers.
Three key ENABLERS	**1. Public support** Public institutions provided great support and financial aids. Without their initial support and funding the project wouldn't have been possible. The need was met by pilot proposition and available project to be tested and validated.	**2. Ecosystem support** The solution was developed with the partnership of the technological centers which provide technological support for start-ups and other organisations. The pilot project was initiated with a technological center.	**3. Smart technology** The advancement of smart technologies and their wider application makes it possible to develop such solutions nowadays. There are various similar solutions and partners from business and technology domains to support the solution.
Three key IMPACTS	**1. Sustainability** Waste management is one of the critical services of the municipalities which requires great resources and causes higher emissions due to the traffic of the collection trucks which has to drive around the city and generate traffic and CO_2 emissions.	**2. Financial efficiency** The cost for waste collection decreases over time. The initial costs for organisation and implementation of e-Menhir is compensated by lower costs due to the reduced number of containers and need for unnecessary collection and traffic.	**3. Better smart city** Providing such solutions and better waste management makes the city smart and improves the quality of life of its citizens. It becomes essential to meet the need for better environment, lifestyle, e-services, and other smart city examples.
What's next	We are developing a new version of the system to incorporate some other features related with the control of waste containers.		

NOISMART

Product name: **Noisense System**

Name in brief: Comprehensive solution for effective noise reduction

Company: **Noismart, Spain** (https://www.noismart.com/en/noisense/)

INNOVATION	APPLICABILITY & SUSTAINABILITY	RESULTS
To reduce noise in Smart Cities, the company has developed the Noisense system based on sensors that measure noise pollution and contribute to social awareness. This network is complemented by other technical and social services. Noisense solves the measurement thanks to an advanced sensor and communication system (IoT, Cloud Computing, Business Intelligence, I.A.) Eco Noisense, is an eco-designed device. It is a project developed under the paradigm of the Quintuple helix of innovation.	The Noisense system has two generic applications: 1. For monitoring like for initial diagnosis, mapping the noise and regulatory compliance; for the acoustic situation and noise in real time; for planning actions; measuring and corrections; alerting in real time in case of exceeding of thresholds; contributing to the regulation of road traffic; maintaining natural areas that require protection; reviewing protocols and informed decision making. 2. For changing behavioral habits; protecting health in case of harmful noise pollution and fostering the coresponsibility idea.	The better monitored noise levels in real time made possible to establish relevant action plans for reducing noise level in city. The result is real time informed decision makers in the cities to intervene properly. The implemented system allowed reporting improvement of the noise pollution in the city in general.

Three key DRIVERS	**1. Increased needs of city to manage noise effectively** It has not been comprehensively addressed till now. The multidisciplinary, multi-agent and coresponsibility approach is yet to be validated.	**2. Market needs solutions** Market with possibilities for innovation because the problem has not yet been rigorously tackled. The solution foresees the integration of Artificial Intelligence through Machine Learning will allow having much more detailed information on the source of noise.	**3. Technology development** High degree of development of Technologies such as: IoT, Biga Data, Business Intelligence, I.A ... making them susceptible to being applied to noise control.
Three key BARRIERS	**1. Needs for collaboration** Innovation that requires joint actions. Due to the cross-cutting nature of the problem, it requires the coordination of different areas of the public ad-ministration bodies, agents, and citizens.	**2. Resistance to change** It is a new way of solving problems and managing this as an environmental and social challenge through advanced governance systems.	**3. Conflicting interests** Solve problems between the multiple agents involved in the generation of the noise and the management of the solution being relevant and with conflicting interests at the same time.
Three key ENABLERS	**1. System approach** Complete solution, based on the integration of innovative services, products, and processes. The R&D of cyber-physical devices based on IoT and Big Data technologies help identify the sources of noise and the levels registered, in time and space.	**2. Possibility of validation** Validation is in progress in the city of San Sebastián/ Basque Country region (Spain). Making a qualitative improvement in relation to the data provided by research and integrated into developments regarding the existing noise levels, its origin and typology.	**3. Good team and financing available** The company has received financing and had ensured a team of researchers and innovation professionals as well as consolidated strategic collaborations (academia, administration, clusters, etc.).
Three key IMPACTS	**1. Decreasing the noise in city** An innovative noise management system tested in a Smart city. Tools and services developed and validated in real environment adapted to the needs of the city.	**2. Triple effect - social, managerial and ecological** Having the noise monitoring solution integrated into the environmental control systems of a Smart City.	**3. Can be used on the city level and in company/user level** Every user having such solution can adopt it to own needs. This will generate recurring income.
What's next	The R&D will develop algorithms that will allow detecting sound events related to environmental noise with the aim of making the analyzed information more versatile, solid and of higher quality for managers and users. At the same time, the integration of Artificial Intelligence through Machine Learning will allow having much more detailed information on the source of noise.		

THE NETHERLANDS

Product name: AirBliss+®

Name in brief: Respiratory Smart Tech wearable protection mask against air pollution

Year 2020

Company: AirBliss+ (https://airblissplus.com/)

INNOVATION	APPLICABILITY & SUSTAINABILITY	RESULTS
First generation air pollution mask wearable with an LED filter change alert, an LED low battery alert, night LEDs, and a two-speed Fan system to support the wearer during moderate exercise. The system allows for a seam-less breathing experience with controlled heat and humidity levels. Includes also a secure seal system, and adjustable harness to ensure a secure fit. An innovative way of functioning on delivering a connected respiratory protection where every wearer is protected against air pollution and receives real-time crowdsourced ambient pollution data. Among the many web services, it delivers accurate, real-time air pollution maps & forecasts	Before the Covid-19 pandemic, the product was targeted at scooter and bicycle users. After the pandemic, people have started to use protection masks in their everyday lives. The applicability of the innovation widens, at least in the European market and can become part of the smart city green technologies particularly in the cities, which fight against air pollutions like by fine dust particles, cars exhausts, harmful industrial emissions, solid fuel combustion, etc. The existence of a powered electronic device allows incorporating sensors that warns when to change the filter and informs about the quality of air.	Unique in its kind, this respiratory encourages widespread use for prolonged hours and daily usage. The impact is mainly in bettering quality of life in the urban areas and achievement of more societal protection from pollution and fighting with different kind of pandemic, such like the coronavirus. The use of the mask will result in better protection of the citizen in Europe against air pollution in the cities and give the local governments one additional tool for the smart cities' strategies and action plans implementation.

Three key DRIVERS	**1. Increasing air pollution** Increasing needs for better protection against air pollution in biggest part of the world. Green planet policy requirements are must.	**2. Multiple applications** Openness for permanent improvements. For example, small batteries in the mask allow for multiple applications (for instance, lights to cycle at night, air-monitoring sensors, etc.)	**3. Public & individual needs overlap** This is the engine of growth in the future It protects individuals from ambient air pollution but is an instrument for smart city protection policy implementation.
Three key BARRIERS	**1. CEE certification** Overcame through excellent preparation of the prototype and its testing and technology validation.	**2. Funding needs** A hardware product (instead of software) requires significant financial investments to move from prototype to a concrete delivery product.	**3. Venture capital attracting** Difficulty in attracting investment from Venture Capital and banks are overcame with support of professional networking and good advisers
Three key ENABLERS	**1. High level protection of IP** Fast and stable protection of intellectual property in the Netherlands has allowed for the smooth, unhurried development of the functional characteristics of the product before it is commercialized.	**2. The stability of the country** Netherlands is economically and politically stable country. This enabled the startup company a smooth development of the technology (innovation) and a relatively easy access to market, advises and support programmes.	**3. Top priority of many governments** Green economy and better and healthy life of people in the world and in the EU are within top most important priorities. This creates market for such technologies by default. The coronavirus crisis proved that the protection of breath of people will stay a challenge in the future and creates market needs.
Three key IMPACTS	**1. Efficiency of individual protection** Improves the quality of life of many citizens at a low public cost. Increase the offer of protective wear (first directed to pollution, now also protects against SARS-CoV-2)	**2. Increased efficiency of the smart city management** An additional and quickly applicable means of protection in extreme situations such as pandemics, industrial accidents, and etc. The technology is easily integrated into urban policy to protect smart cities as a whole.	**3. Reduced morbidity of citizens** The easy access to such masks and the information provided by the sensors gives people a chance to reduce their direct contact with harmful air. Preventive reduction of morbidity and the spread of harmful substances and viruses is achieved.
What's next	The company is already working on the second release to incorporate a Gas pollutant sensor including NO2 concentration monitor with high-level alert function. Their mission is to enable mass adoption of anti-pollution masks in order to protect city dwellers in highly polluted urban areas around the world. The main plan is to make the innovation smarter (for instance, adding sensors with multiple capacities). Move from a B2C to a B2B type of market (for instance, expanding the market to companies that work in hazard environments and might need a protective mask.)		

Product name: **SmartBook**
Name in brief: Software application for conversion a text into a smart book
Company: SmartBook Publisher (www.smartbookpublisher.com)

Year 2020

INNOVATION	APPLICABILITY & SUSTAINABILITY	RESULTS
SmartBook is an application for scholar books that applies real-time translation to 16 languages of academic books. The app also contains a real speaker functionality that allows users to listen to study books. It is a software application for conversion a text into a smart book, ready for publication as a digital or a classic printed book. It is in 16 languages.	The team behind the product provide the affiliated authors with professional support, fresh ideas, designs and technical solutions. Sitting behind one's PC and start writing with the Microsoft Word with this smart software, one's text is then converted into a smart book that he/she can publish as a digital book as well as a classic printed book.	Millions of people in the world dream of writing and publishing their own book. It resolves some of the problems that special programs of another publisher cannot. It also offers all the necessary help with the publication. The writer writes a manuscript and the application turn it into a SmartBook! After which it can be updated 24/7.

Three key DRIVERS	**1. User-friendly innovation** SmartBook app is easy to use and very intuitive. It allows very fast and prompt translation, functions like listening to study books which improves the study process and grabs attention of students. It serves the needs of the students meeting their expectations for interface, functions, applicability and customization.	**2. Functionality** Is adapted for people with different needs. It allows users both to read and/or listen in 16 languages using different functionalities in one single platform. Besides providing real-time translation of books (written and audio), it offers the possibilities to video-meet and listen to podcasts. Thus, it provides social media functions and meets wide range of customer needs.	**3. Professional support** The team behind the app provides support to authors, providing also new ideas, technical solutions. The platform gives opportunity for many new authors and people who want to publish their own book. The fact that the writer writes his/her manuscript and the application turn it into a SmartBook gives freedom and new opportunities.
Three key BARRIERS	**1. Risk-averse team members** Aversion to risk by some members of the management board (intrinsic to working with smart technologies) might be a barrier for advancement in technology, making new modifications, generating new offerings, further rapid development that requires higher risk.	**2. Decision making process** Taking decisions to advance the app is a time-consuming process in the team. The process takes time and this might prevent from fast reply and reaction to the market and the customers' needs and expectations. It leads to missed opportunities and business.	**3. Competition** The advancement of technology and the need for e-learning and distance learning increases the market, demand and the competition of newcomers. Barriers for entry are not high and the start-ups are fast in development and innovation in this field.
Three key ENABLERS	**1. Technological advancements** The availability of real-time translation technology, besides the technical background to develop a user-friendly app and allows further improvement of its functions, add new ones, services. The writer can update this book 24/7.	**2. Partnerships** SmartBook received great support from the government and universities as pilot users and customers to validate the solution. The partnership with these institutions increased the credibility and market entry in the countries of operation. Their use of the platform opens doors for further users from their students, members, staff, etc.	**3. Coronavirus crisis** The current pandemic situation made the online, digital educational market grow. This provides various opportunities for business, new solutions, business models. It is a good context for profitable business and new solutions.
Three key IMPACTS	**1. Social impact** Increased the offer of academic resources for people who cannot read and for people with different degrees of vision loss. The function of audio books gives a wide range of opportunities for this target groups and increases the social impact of the platform. This can further generate new opportunities for them.	**2. Education impact** Expanding offer for distance-learning tools in the Netherlands and better opportunities and technological solution for e-learning. Under the current pandemic situation, it is a great advantage and need for education institutions and training organisations. SmartBook can support the process and develop new offers.	**3. Economic impact** The platform gives opportunities to publishers, authors, newcomers to the sector, and thus develop new businesses and authors. Writing with this smart software, one's text is then converted into a smart book that he/she can publish as a digital book. In addition, the team provides professional support.
What's next	Expand the business beyond the Netherlands; the UK will be the next market. Broaden the catalogue of resources (addition of more books, magazines and other publications).		