

VFC: VIRTUAL FUTURE CITY

Connecting physical and virtual worlds

Portfolio 2020



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CREA IDEA LAB LTD.

Think tank for advanced cities

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2020: THE TIME IS NOW

The world was hit by an unprecedented crisis created by the need of social distancing because of the COVID-19 virus threat.

We have seen an acceleration in the digital transformation of many industries. Remote employment and video-conferencing have become the new way of doing business and pursuing professional realisation.

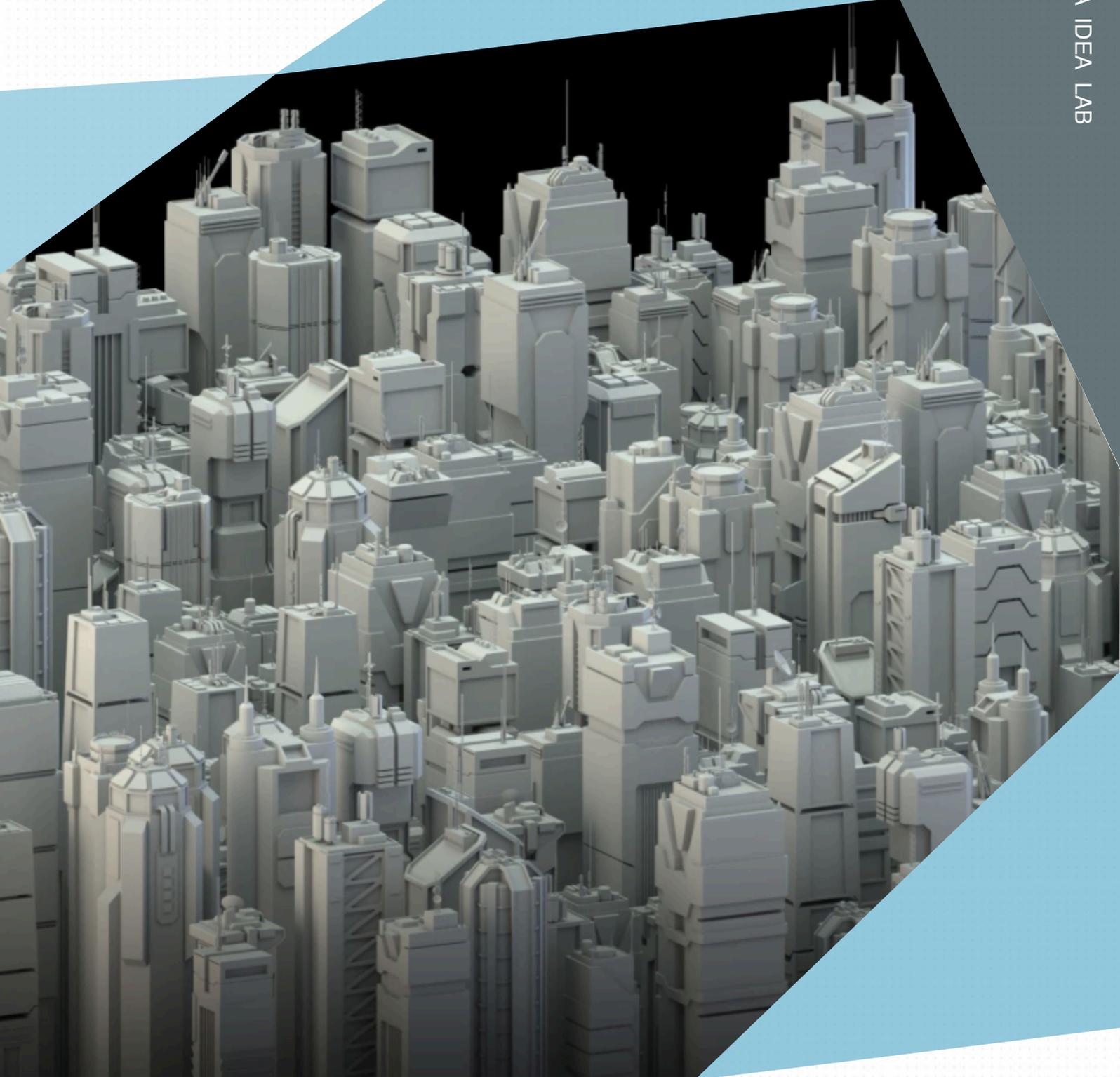
Now is the right moment to connect in a robust way the physical and virtual worlds. Both society and citizens are ready. The technology exists.

For this purpose we have launched the Virtual Future City (VFC) project. Its ambition is to demonstrate a technological integration which brings the users in a *friendly & easy* way to a highly automated life. Our main purpose is to smoothly connect the virtual and physical worlds with additional enabling of virtualisation of some of the user's professional and personal needs.

Our mission is to help cities grow their opportunities while balancing resources and negative environmental impact through their virtual twins.

Katerina Zalamova

Manager



“Virtual world is an automated, shared, persistent environment with and through which people can interact in real time by means of a virtual self.”

-Richard Bartle, 2010

ABOUT

Virtual Future City (VFC) Project is created, launched and promoted by CREA IDEA LAB LTD., a think tank for advanced smart cities development.

It is born from a detailed market research about the latest trends in Platform's economy. Our ambition is to convert the VFC platform into the leading one by 2030 covering 80% of the Internet users on all devices.

The VFC platform is designed to enable the accelerated digital transformation of businesses and cities in a simple way while smoothly integrating legacy technologies. It easily integrates with third party solutions while keeping a high level of encryption and protection against cyber and physical threats. It connects and enables smooth communication between devices, software modules (e.g. specific AI module for edge analytics), people, businesses and public authorities.

TEAM

Dr. Katerina Zalamova is a recognised Smart Cities expert with a special interest in zero waste infrastructures and the circular economy along with the adoption of digital infrastructures focused on economic development and social change.

Along with her Smart City consultancy, Dr.

Zalamova runs the think-tank for advanced cities, CREA IDEA LAB, with the objective to transfer new technologies and circular economy knowledge to the new and growing smart societies. At CREA IDEA LAB she also fosters, mentors and supports new smart innovators and young entrepreneurs who she believes will be the next developers and applicators of the new smart cities.

Andrea Herrera is a conscious leader and social activator for impactful business. She is an insightful cross-cultural agent passionate about exploring regenerative and sustainable futures amplified by tech through her involvement in communities such as Wisdom Health, Empatica XR, Davos Blockbase and BlockBase Trust.

Cormac Kelly, with a particular interest in smart city technology and critical communications consultancy is the CTO and Technology Partnerships Director. He acts as innovation and IoT advisor for CREA IDEA LAB. Cormac has 25 plus years' experience in the security, IoT, and critical communications industry where he has had various commissions and experiences around innovative Application & Platform Solutions, IP-Networks, Mesh & LTE Communications Systems, Video Surveillance, Access Control and Tracking solutions. This along with his experience in Cyber Security Solutions and Enterprise Security Sales gives him a deep commercial and hands on expertise from selling to government, first responder agencies, city municipalities and commercial clients around the world.



ANDREA HERRERA

CMO & Head of Business
Development



CORMAC M. KELLY

CTO & Head of Technical
Partnerships



KATERINA ZALAMOVA

CEO & Head of Business
Strategy

TECHNOLOGY

VFC Platform consists of following main groups:

BLOCKCHAIN TECHNOLOGY

Blockchain technology VPLedger is the fundamental layer of the platform. It ensures an inherent high security in the architecture, enables an identity and access management with a veritas persona function, and finally, all communication, exchange and transactions are encrypted messaging between every entity (user) in the platform. It enables high interoperability and interconnectivity between all device's protocols and different users providing a sustainable, stable solution.

The design minimises the platform data storage by implementing a Distributed Digital Ledger. Thanks to the technology's intrinsic nature, the cybersecurity is improved minimising the costs for maintenance, technical intervention and downtimes related to cybersecurity threats.

AI ADVANCED ANALYTICS

On top of the Blockchain layer operates an advanced analytics layer powered by Artificial Intelligence technologies. It enables the match of the user's public keys as a messaging engine on the platform. Furthermore data processing at the edge is applied by default to automate processes and to enable autonomous operations. The VFC platform provides a fully

automated production-logistic chain between the different customer targets enabling sharing services between industrial silos.

3D GRAPHIC INTERFACE

The VFC platform has a 3D universe front-end interface where users are represented by avatars with 3D motion function. The platform design focuses on 3D graphic representation of the physical world with the specific objective of minimising data storage for surveillance applications and for better user engagement through easy data consumption.

An advanced analytics function compares the real images to our animated representations for differences. Only the differences are recorded enabling alerts and automated responses depending on the monitoring criteria.

The platform has a specific AI image recognition of people which compares the real-time video image for identification of the citizens with their Avatar's profiles by different characteristics such as height, silhouette shape, and lastly, facial features. This function can integrate data from different types of cameras such as CCTV, Infrared or LIDAR.

All types of representation of information are embedded in a unified 3D universe. The user can smoothly switch between 3D navigating and 2D video, from image and text to video-conferencing visualization forms as they are embedded elements of the platform interface.

BENEFITS

VFC Platform delivers positive exponential economic benefits based on the technological, environmental and social impacts.

TECHNOLOGICAL IMPACT

Compared to established City & Enterprise Digital Platforms, VFC:

- Has 80% more simple code.
- Is more agile, flexible & scalable.
- Offers high customization.
- Is open with easy integration of third parties.
- Has high security.
- Offers high Benefit/Cost Ratio.
- Offers reduced costs for data storage.

SOCIAL IMPACT

It provides the following benefits to a city:

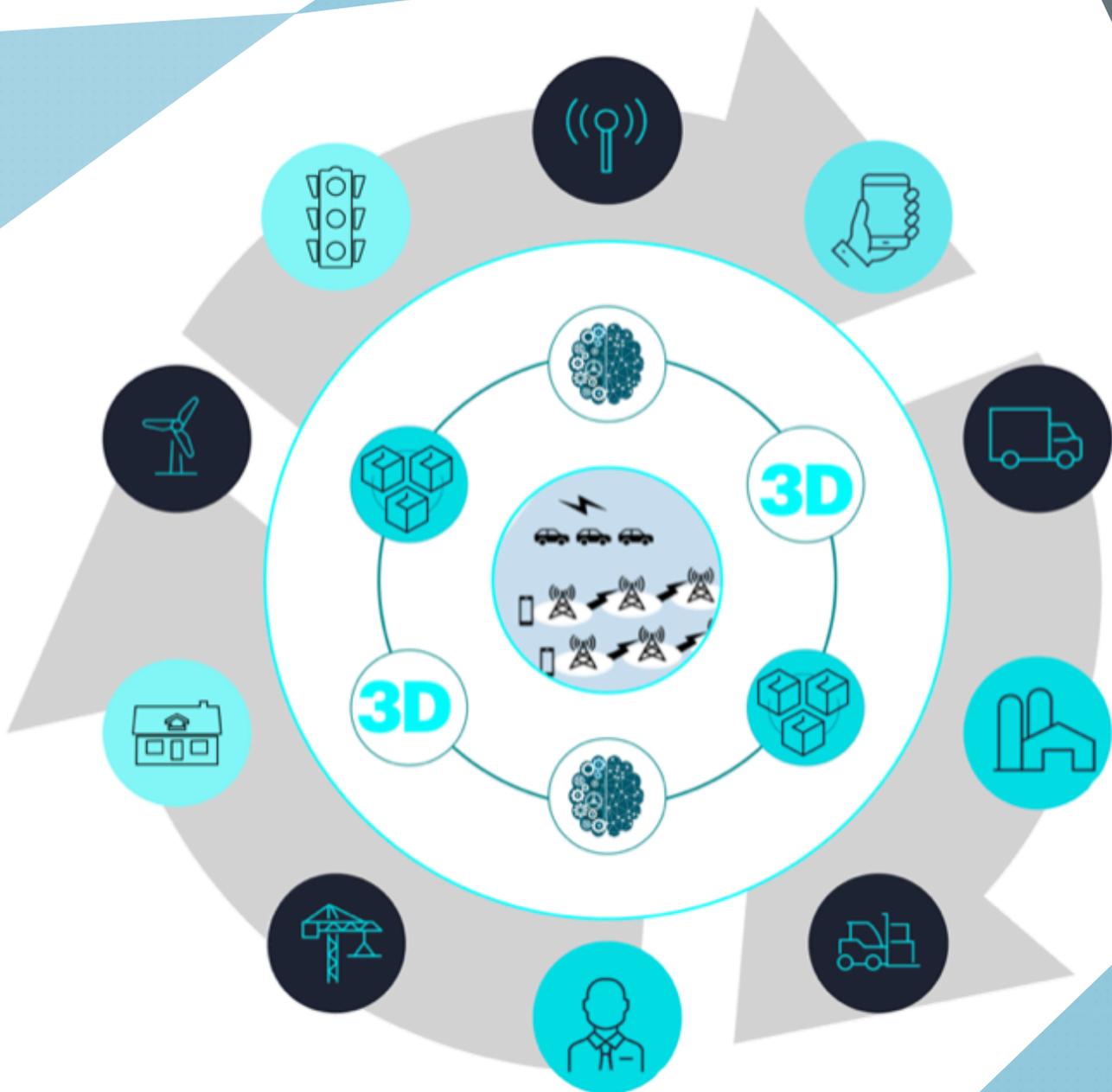
- People come together easily.
- All the stakeholders share all the

knowledge connected in communities. This improves citizen participation and consequently, the city's resilience against crisis.

- The city expands its physical dimension in to the virtual one. This multiplies the opportunities for its stakeholders.
- The city becomes more inclusive as digital, gender and generational gaps can be bridged leveraging the economic conditions between social classes.
- New employment & Local Economy Growth is enabled.
- The city can expand its cultural heritage promoting modern and emerging art.

ENVIRONMENTAL IMPACT

VFC platform has reduced up to 80% the computational demand compared to other similar platforms. This translates into a similar reduction of energy consumption. Because of sharing services, the duplication of devices is minimised creating savings in the public space and in costs for maintenance, technical intervention and downtimes.



PORTFOLIO

USE CASE APPLICATIONS



Smart City Platform

E-Governance

Client: City of NEOM, KSA

Objective: E-Visa, digital residency

Target population: Tourists

Industries: Public Administration, Education, Tourism

VFC Platform can be applied as a E-governance infrastructure and smart city platform. The specific use case has been developed for the needs of the City of NEOM in KSA.

In this specific use case, overarching public service offering with prioritized customer journeys has been enabled under a city app function. This function is a **public services marketplace** with the offering evolving over time. For example, it has a specific area regarding citizen consultation and participation for a collaborative city development. It connects the user to different city authorities such as emergency services, hospitals, schools, etc. Through this function the user can interact with the city through its smart infrastructures improving their operational efficiency.

The platform integrates the data flows in the city stakeholder's ecosystem enabling **self-autonomous regulation between parties**: citizen-to-citizen, business-to-business, business-to-public administration, citizen-to-public administration and between public administration entities.

Additionally, it enables a **virtual residency** and remote labour through issuing E-Visa which improves the city's capacity to attract talent from everywhere in the world.

The solution also has a marketplace application which enables the transformation of the local economy to circular economy by creating **circular communities** based on resource's flows.



Virtual Co-working Space

Virtual Economy

Client: The Leith Planning Group

Objective: Remote work space

Target population: Businesses

Industries: Real Estate,
Commerce

VFC Platform opens a unique opportunity for the Real Estate industry to get revenue from the 3D models of their buildings before and after the construction process is completed.

This specific use case is a virtual co-working space where remote workers can get a similar feeling to the one working in a physical office. The employees enter the Virtual Office with their avatar and see and interact with the avatars of their colleagues. This feeling of community is shown to improve the user engagement and to relax the stress from working hours.

The employers (businesses) receive a full business intelligence package from the employee's work place where its work is kept and its performance monitored.

Virtual Office and Co-working space can be a secondary rent offering for the Real Estate companies while improving their promotion campaigns and occupation levels. Opening a building in the virtual world is a real-users simulator about the building performance. Also, it offers a feedback from real users which can improve the decision-making process of the developer.

VFC platform offers a full suit for a smart building management while improving the tenants experiences through the 3D interface. It provides an automated purchasing and payments for services and supplies (e.g. energy). It enables easy sharing of services between buildings and a unified monitoring platform for the Owner without restrictions from the location of the sites.



Virtual Hospital

E-Health

Client: The Leith Planning Group

Objective: Online education, Telemedicine, Smart Buildings

Target population: Health professionals, Citizens

Industries: Health, Real Estate

The VFC Platform's focus is to digitise the cities and their services, buildings and economies. In this framework, one of its applications is the Virtual Hospital.

The first specific use case of the Virtual Hospital is for professional training opening the surgery and other specialised areas of the hospital for on-line visitors (students). The platform offers video conferencing features in different environments of the Virtual Hospital. VR and mix reality representation of medical data and training content is smoothly integrated in the platform interface.

Also, the platform offers an engagement environment for telemedicine enabling the citizens to connect with the doctors using their Avatars and video-conference.

The Virtual Hospital keeps the medical records in the private cloud of the physical hospital. The VFC platform easily connects sensors to the virtual environment. Then, a physical hospital can digitise its physical infrastructure and transform it to a smart one automating the processes in the physical space. For example, the communication between the medical personnel is improved because of smooth sharing of real-time information.

Sensors in the patients rooms can remotely provide to the doctors the state of the patient and alert in case of emergencies. Additionally, on-line entertainment, education and training can be provided to the patients for their better recovery.

In the near future, a robotisation of the logistics inside of the hospital building can be implemented.



Virtual Tourism

Virtual Economy

Client: Ministry of Culture and Sports, Greece

Objective: Virtual Touristic Routes

Target population: Citizens, Tourists

Industries: Real Estate, Commerce, Tourism

VFC Platform aims to deliver an exact copy of the physical world into the virtual space. Our 3D Interface is based on the previous experiences with 360° photography and video-games 3D motions.

A specific application of the platform is creation of a virtual touristic tours which improves the user experience from 2D content and 360° movies to a close to reality walking around experience.

Our solution focus not only on the touristic site and its content but also, on the environment around it (e.g. souvenir's shops).

Virtual Touristic Route application virtualise the region where a specific touristic site is placed offering improved promotion for the local economy and more adventurous experience to the travellers.

It can be integrated with physical infrastructure to provide immersive educational experience.

Additionally, the Virtual Touristic Route can be the first step for transforming a given region into smart city one.

Some of the services which the application offers are the following:

- › Embedded ticketing and on-line sales of local products.
- › Engaging regional promotion offering content for the touristic site, local economy, weather, people.
- › Educational tours about history, geography, language, etc.



Smart 5G Infrastructure

Digital Transformation

Client: MCIT, KSA

Objective: 5 PoCs: 5G Offshore, Smart Farm, Smart School, Smart Warehouse, Smart Tourism

Target population: Citizens

Industries: Public Administration, Education, Tourism, Manufacture Industry, Agriculture, Farming, Supply Chain, Emergency Response

VFC Platform was applied into an integrated 5G & Multi-Access Edge Computing Smart infrastructure. The specific use case has been developed for the needs of the Ministry of Communications and Information Technology of Saudi Arabia.

In this specific use case, the solution consists of a physical infrastructure, the VFC platform and application ecosystem. It provides services to five use cases (PoC): 5G Offshore, Smart Farm, Smart Warehouse, Smart School and Smart Tourism.

Because of the integrated approach, a shared services between applications are available such as drone surveillance, robotic automation, immersive education. The list of the main services are the following:

- 3D AR/VR content for maintenance and education.
- Remote control of machinery/ AGV/AMR.
- Surveillance & Real-time video monitoring.
- Traffic optimisation.
- Real-time item tracking.
- Image recognition: objects and people.
- End-to-End value chain automation.
- Communication network management & orchestration.
- Integrated emergency response.

Carbon - neutral Industrial Zone

Green Economy

Client: EU Commission

Objective: Zero waste industrial zone

Target population: Businesses

Industries: Manufacture, Agriculture, Farming, other business activities

VFC Platform was applied as a digital layer to an integrated waste management infrastructure. The specific use case has been developed for the needs of the Trakia Economic Zone (TEZ) located in the region of Plovdiv, Bulgaria. It is an industrial zone of 10,700,000 m², over 2 billion euros of investment with more than 180 enterprises located in 6 smaller industrial zones. TEZ is the largest and most sustainable industrial area not only in Bulgaria, but also in Southeast Europe. The industrial zones compounding TEZ are surrounded by more than 50 larger farms and 150 agriculture entities.

This specific use case consists of the VFC platform and a physical infrastructure of waste recollection and recycling units.

The main objective of the VFC platform in this specific use case is the minimisation of the generation of residues through connecting the stakeholder's of the industrial zone into a circular ecosystems.

The main functions are:

- Universal marketplace for sharing and exchange of any type of resources such as time, skills, objects, materials, transportation, knowledge, etc.
- CO₂ certification and inventory.
- Carbon credits saving account.
- Green & Circular Economy Education.
- Circular Economy Communities.

ABOUT CREA IDEA LAB

Leaders in evolving the understanding around smart cities development

CREA IDEA LAB has a strong focus on developing methodologies for the successful building of smart cities projects. We believe it is never only about technology. It is the purposeful application of technology that makes all the difference.

We contribute to the International community of smart city developers through our memberships in different organisations, such as the **European Innovation Partnership on Smart Cities and Communities**, the **European AI Alliance**, the **IoT Catalan Alliance**, the **Chamber of Commerce Brazil-Catalonia**.

CREA IDEA LAB have been actively collaborating in the organisation of the satellite events of Mobile World Congress since 2016 and we have been an ambassador of the IOTSWC since 2019. Additionally, we have been actively participating at the Smart City Expo World Congress since 2015.

CREA IDEA LAB is a founding member and core organiser of think tank group "Advanced Artificial Intelligence" in Barcelona. The think tank group was found in 2019. Its first annual meeting was celebrated in February 2020 under the name **AI Tech Spirit** Conference where 38 international experts debated for two days about the future of the AI technology, ethics, finance, political aspects and applications.

Additionally, we are influencers in the technological development and its implementation strategies, where we look to keep a wide public debate focused around the social impact of the technology. For this reason, CREA IDEA LAB is the organiser of the **LEGACY SUMMIT**, a conference focused to showcase best practices oriented to create the future that will be in 100 years from now.

We have developed strategic relationships with technology developers, integrators and providers which helps us position ourselves in the front-line of the smart cities innovation. Thanks to these collaborations CREA IDEA LAB counts with an extended network of international experts in all fields of the smart cities market.

The main areas of research in CREA IDEA LAB are the following:

- ▶ **INTEGRATED SMART INFRASTRUCTURES**
- ▶ **INDEPENDENT ROBOTICS AND SMART CITIES**
- ▶ **SMART CITY DIGITAL TWINS**
- ▶ **NATURE AS AN INFRASTRUCTURE**
- ▶ **FUTURE SOCIETIES**

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