ROCK

Graphical & Interactive technologies: trends and future opportunities for cultural heritage and urban regeneration

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Grant Agreement: No 730280

Project Acronym: ROCK

Project Title: Regeneration and Optimisation of Cultural heritage in creative and Knowledge cities

Thematic Priority: SC5-21-2016 - Cultural Heritage as a driver for sustainable growth

Start Date: May 1st, 2017

Duration: 36 months

Total cost: EUR 10 586 948,74

EU contribution: EUR 9 873 585,88

www.rockproject.eu

ROCK   PROJECT DATA

INNOVATIVE
COLLABORATIVE
CIRCULAR
SYSTEMIC

APPROACH for **regeneration and adaptive reuse of historic city centres** by implementing a repertoire of **successful heritage-led regeneration initiatives**

10 cities

Comune di Bologna · LISBOA · Vilniaus miesto savivaldybė · PRIMĂRIA ȘI CONSILIUL LOCAL CLUJ-NAPOCA · Culture Liverpool · Liverpool City Council · VILLE DE LYON · CITTÀ DI TORINO · ΔΗΜΟΣ ΑΘΗΝΑΙΩΝ · ΕΤΑΙΡΕΙΑ ΑΝΑΠΤΥΞΗΣ ΚΑΙ ΤΟΥΡΙΣΤΙΚΗΣ ΠΡΟΒΟΛΗΣ ΑΘΗΝΩΝ · EINDHOVEN

7 universities

ALMA MATER STUDIORUM UNIVERSITA DI BOLOGNA · VILNIAUS GEDIMINO TECHNIKOS UNIVERSITETAS · TU/e Technische Universiteit Eindhoven University of Technology · UNIVERSITY of York · ICS INSTITUTO DE CIÊNCIAS SOCIAIS · ΕΛΛΗΝΙΚΗ ΔΗΜΟΚΡΑΤΙΑ ΑΝΩΤΑΤΗ ΣΧΟΛΗ ΚΑΛΩΝ ΤΕΧΝΩΝ

2 city networks

EURO CITIES · I.C.L.E.I Local Governments for Sustainability

Companies, Associations, Foundations

CONFINDUSTRIA SERVIZI INNOVATIVI E TECNOLOGICI · corvallis PROCESS & SOLUTIONS · nowhere · acciona · DFRC from data to knowledge · ARIES TRANSILVANIA · Julie's Bicycle SUSTAINING CREATIVITY · ecopreneurs for the climate · TASO · FITZCARRALDO FONDAZIONE · VIRTUALWARE · Viabizzuno

ROCK CONSORTIUM

13 European Countries

32 International partners

36 months

7 ROLE MODEL CITIES

Athens (GR)
Cluj-Napoca (RO)
Eindhoven (NL)
Lyon (FR)
Liverpool (UK)
Turin (IT)
Vilnius (LT)

Knowledge sharing via: mentoring activities, work shadowing visits, webinars, Living Labs, etc.

3 REPLICATOR CITIES

Bologna (IT)
Lisbon (PT)
Skopje (MK)

ROCK Platform (data collection and monitoring – interoperable environment)

ROCK CONSORTIUM AND CONCEPT

Cultural Heritage leading urban futures...

...a shared **multi-cultural, multi-heritage and multi-stakeholder's** city vision

...the integration of heritage-led regeneration, sustainable economic development, city promotion,and knowledge sharing.

ROCK   VISION

NETWORKING & MENTORING
1. ROCK WEB PLATFORM [CORV]

CREATIVE&CULTURAL HERITAGE EXPERIENCES
2. CH EXPERIENCES [VWG]
3. PEOPLE FLOW ANALYTICS [TU/e]

IG TOOLS
4. CARBON FOOTPRINT CALCULATOR FOR GREEN EVENTS [JB]

CH & PEOPLE PERCEPTION
5. INTEGRATED CULTURAL HERITAGE ANALYTICS [VGTU]

SAFETY
6. LARGE CROWD MONITORING TOOL [DFRC]

ENVIRONMENT & CLIMATE
7. OUTDOOR MULTI-PARAMETER [ACCIONA]
8. OUTDOOR THERMAL COMFORT [UNIBO]
9. INDOOR MICROCLIMATE MONITORING [UNIBO]
10 THE CULTURE OF LIGHT [VBZ]

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TECHNOLOGICAL TOOLS

| CULTURAL HERITAGE

`Interactive technologies` can be efficiently used to `present` and `preserve` cultural heritage

- The users can now EXPERIENCE cultural heritage

- Objects which do not exist any more can be brought back to collective memory of people

EDUCATION

- GAMIFICATION
- CREATIVITY

Goal: *Making past of the city visible for citizens through creation of innovative spatial experience and accessible information.*

City Branding:
To find a path for these cities in order to communicate their uniqueness and protect the legacy coming from the past as an asset for the future.

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Target group
Public authorities of the city, specifically those working on urban development, city branding and city marketing

The solution is provided as a communication guide for stakeholders working on urbanism, architecture, contemporary art, heritage management and preservation, creative industries, tourism...

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Technologies for Intelligent Tourism Destinations (DTI)

- Seeking a *more efficient and sustainable management* and
- an increase in *the quality of services* and opportunities offered.

The **technological solutions** will come to add value to **Tourism Journey**;
- in their pre-trip decisions,
- during their stay at the destination and
- after their trip

Today's tourist can:

- select their trip through interactive webs where they can obtain information in real time of the destination and plan your trip,
- download the application of the destination with geo positioning and contents in Augmented Reality on your Smartphone / Tablet or
- virtually visit Through web or virtual reality, the place where he was to recreate his experience

Solution

The objective of the project is to create a product (prototype) for enhancing cultural assets of municipalities. The prototype will allow to better know locations and buildings (cultural experience) of your city through a mobile application, whose content will be managed by the city representative itself.

Innovation

The main innovative features of the proposed solution are:
- Geo-localised point recognition
- Interactive graphical content management
- Advance graphical content Interaction (VR/AR)
- Creative User Experience – (CUX) design accesible4all
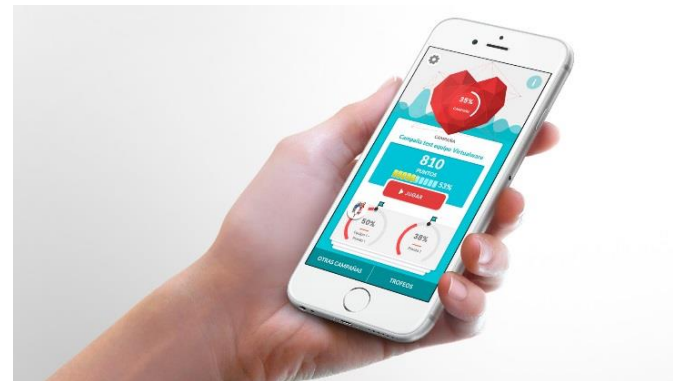
Skopje
Cultural Archipelago

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Skopje– Action 1: Skopje Cultural Archipelago
Virtual guide for Old Bazaar + Virtual model of Jewish neighborhood

"Virtual guide" is a project for visualization of the historic layers, the lights and sounds of the Old Bazaar collected through a system of apps, sensors and other digital tools. The project is provides easy accessible information reinforced with augmented reality software and tools for easy to use apps for mobile smart devices. The idea is that this app would provide access to integrated information about the architectural cultural heritage at the proposed location for every potential user.

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SKOPJE– Action 1: Skopje Cultural Archipelago
Virtual guide for Old Bazaar + Virtual model of Jewish neighborhood

"Skopje Jewish quartier" is a project for mapping of Jewish community in Skopje and creation of virtual model of Jewish neighborhood destroyed in the WWII and in the earthquake in 1963. Virtual model will enable users to explore the life and the personal narratives and the history of its inhabitants embedded as a web platform and mobile phone application and through a dynamic navigation and VR enabling visibility and understanding of the dematerialized cultural heritage of Skopje.

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THE VIRTUAL GUIDE THROUGH THE SKOPJE OLD BAZAAR IS A MOBILE APPLICATION THAT VIZUALIZES SOME OF THE NO LONGER EXISTING AMBIENTS OF THE OLD BAZAAR LOST IN TIME AND MAKES THEM VISIBLE AT THE SAME LOCATION AT WHICH THEY ONCE EXHSITED

- THROUGH A SMART PHONE OR A TABLET, USING A 3D AR MODELS, THE NO LONGER EXISTING OR ALTERED MONUMENTAL HISTORICAL BUILDINGS IN THE OLD BAZAAR WILL BE VISIBLE ONCE AGAIN IN THEIR ORIGINAL OR OTHER HISTORICAL STATE AT THEIR EXACT LOCATION.

- USING THE VIRTUAL GUIDE APPLICATION THE MONUMENTAL BUILDINGS AND LOST AMBIENTS OD THE OLD BAZAAR WILL BE VISIBLE ONCE AGAIN FROM THE PREVIOUSLY MARKED POINTS FROM WHICH THE ORIGINAL HISTORICAL PHOTOS WERE TAKEN SUPERIMPOSED OVER THE SAME PRESENT VISTAS.

KJURCHI HAN
3D AR MODEL - RECONSTRUCTION OF THE PRE EARTHQUAKE STATE OF THE BUILDING VISIBLE FROM THE PARKING PLATEAU OF HOTEL BUSHI

SHENGJUL (GJULCHILER) HAMAM
3D AR MODEL OF THE EXTERIOUR + HISTORICAL PHOTOS OF THE HAMAM AND ITS SURROUNDINGS VISIBLE FROM PREVIOUSLY MARKED POINTS ON THE PLATEAU IN FRONT OF THE MUSEUM OF MACEDONIA AND THE ACCESS PEDESTRIAN PATHWAYS

- THE LOCATION IS SUTABLE FOR ORGANIZING AN EVENT

LOST AMBIENTS
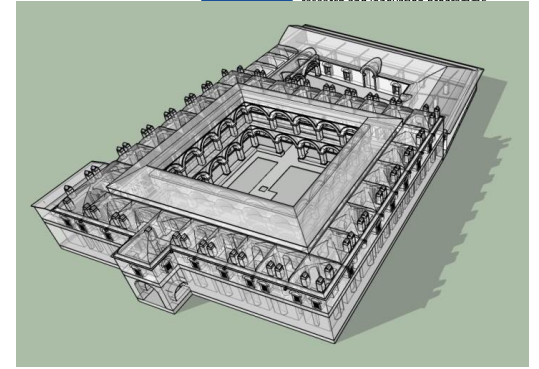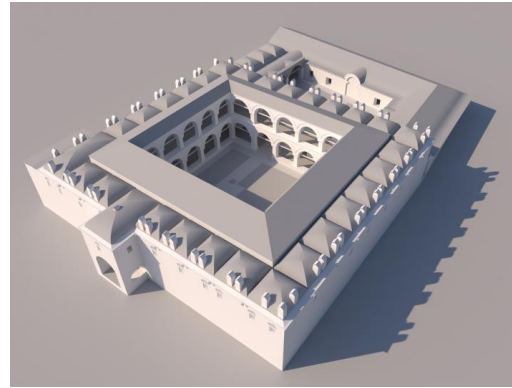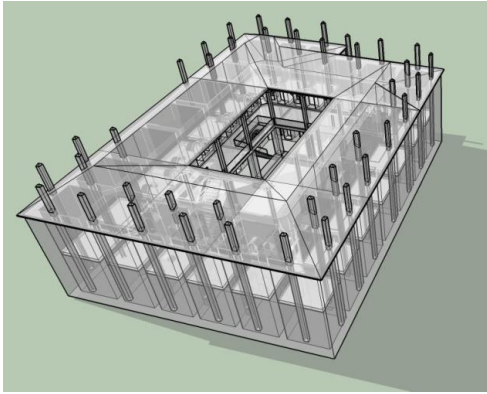
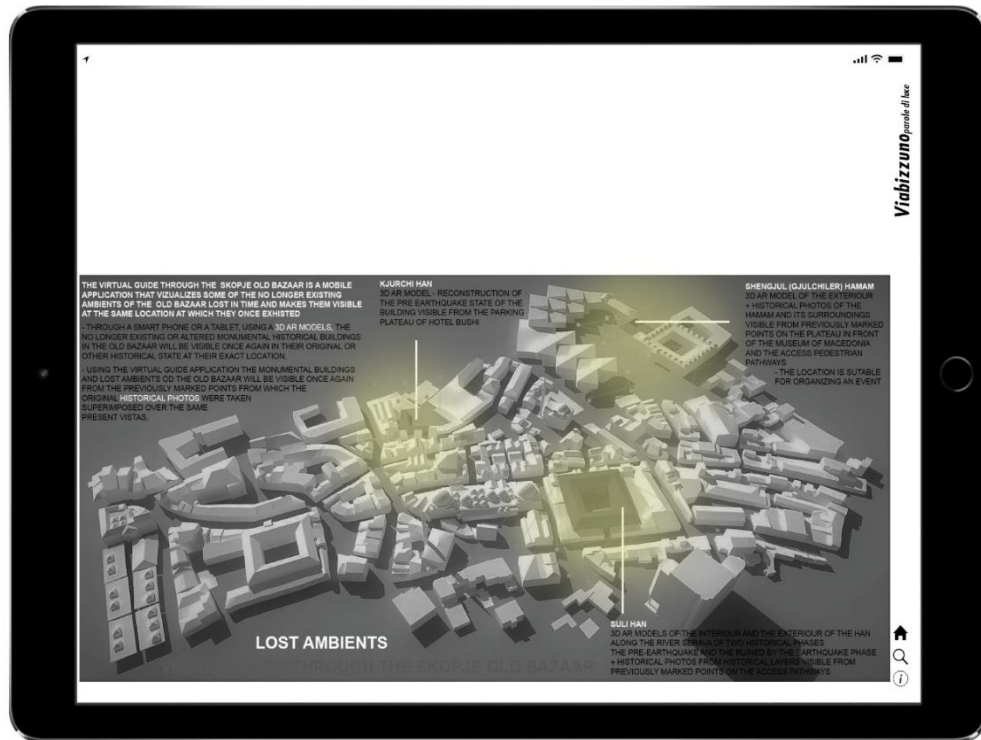**VIRTUAL GUIDE THROUGH THE SKOPJE OLD BAZAAR**

SULI HAN
3D AR MODELS OF THE INTERIOUR AND THE EXTERIOUR OF THE HAN ALONG THE RIVER SERAVA OF TWO HISTORICAL PHASES THE PRE-EARTHQUAKE AND THE RUINED BY THE EARTHQUAKE PHASE + HISTORICAL PHOTOS FROM HISTORICAL LAYERS VISIBLE FROM PREVIOUSLY MARKED POINTS ON THE ACCESS PATHWAYS
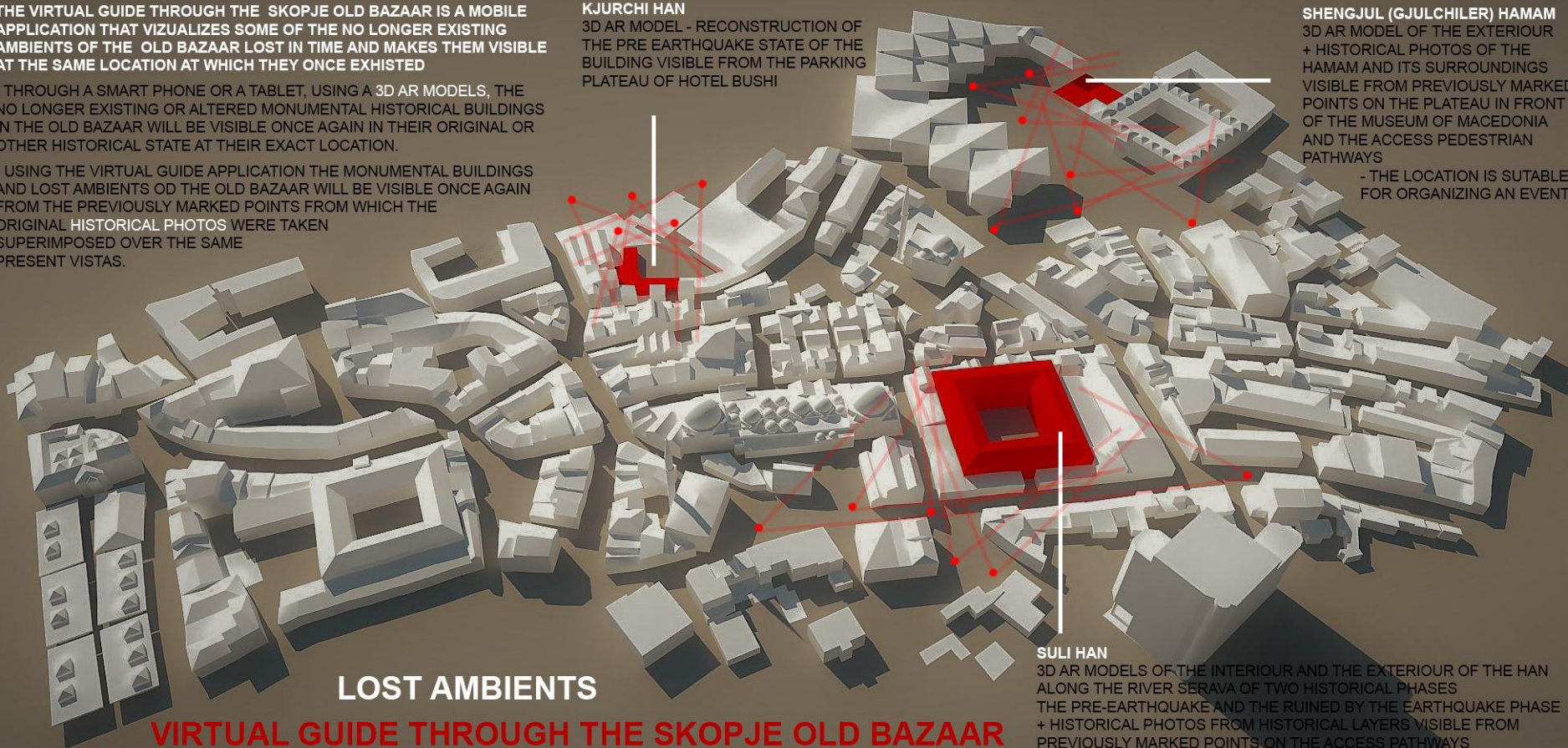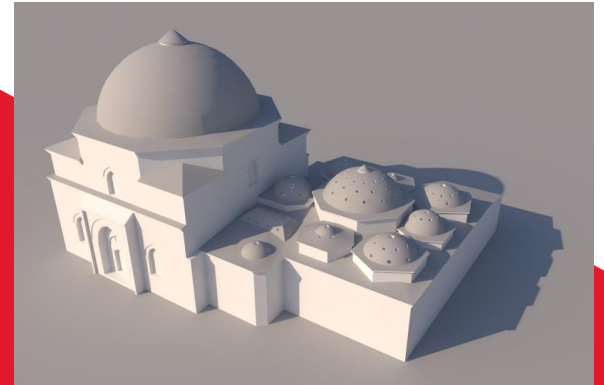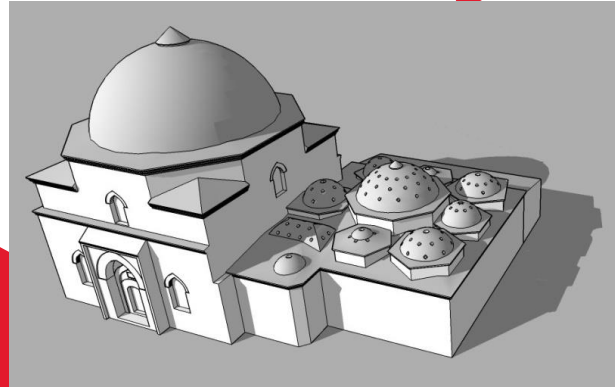
the app becomes a tool of tourist guide support:
1. contains the main information on individual works.
2. suggests one or more routes to the tourists.
3. allows an experience of light-driven discovery, accompanying the narration of the guide and highlights the characteristics of the works.

Use Case 1: Bologna

Municipal Theater of Bologna

[Theatre website: http://www.tcbo.it/]
The historic theater building overlooks Piazza Verdi,
the heart of the university area which is the subject of ROCK's interventions.

Features:

to allow those in the square to virtually access and discover the building, including the most
hidden and fascinating places of the theater machine (behind the scenes, under the stalls, the
lumiera, seen from the panoramic terrace…).
The user would have available a virtual tour and archive materials that represent the relevant
aspects of the history of the theater, in particular:
- architectural drawings;
- historical posters;
- audio recordings;
- photographs;
- sketches of costumes for historical settings;
- virtual theater visits

Use Case 2: Liverpool

6 zonas principales de la ciudad;
- The Pier Head,
- Albert Dock, Stanley Dock / Ten Streets Area,
- Castle Street (Mercantile Commercial District),
- Cultural Quarter   (William Brown Street)   St
    Georges Hall &Ropewalks) +
            1 monumento representativo de
            cada zona
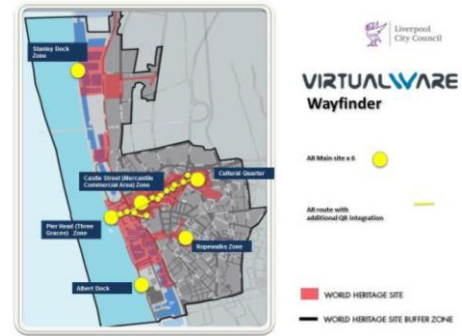
Use Case 2: Liverpool

Saint George Hall – Liverpool

[Hall website: https://www.stgeorgeshallliverpool.co.uk/]
Recognized as one of the finest buildings built in the neo-classical style.

Way finder for St Georges Hall including QR route and immersive content

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Features:

To allow visitors in the city to access St George's hall to utilize visual images, immersive content, Virtual reality and Augmented reality, displays, and to access interpretive information via QR code to access.
- The worlds first commercially air-conditioned buildings
- The history of St George's Hall as the emotional heart of Liverpool
- The legal courts and their processes in Liverpool, and what it had been like to be a prisoned
  in Dickensian Liverpool.
- To view the Neo-classical St George's Hall, its great Hall, and the best Minton Floor in the World.
- To allow visitors to access the World Heritage Sites for Liverpool

State of the art

| R&D CAPABILITIES

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- Graphical Interfaces (**VR&AR&XR**)

- Interaction with Human Machine Devices (**HMI**)

- Creative User Experience (**CUX**)

- Data model integration

INTERACTIVE TECHNOOLOGIES TO PROVIDE VALUE ACROSS SECTORS

Industry
Optimizing Business processes

## Cultural Heritage
Multiplying Audience Engagement

Health
Creating Medical Value

VIRTUALWARE

| INDUSTRY 4.0

Interactive technologies for improving **efficiency** in Industry 4.0 processes and **accuracy** in real time decisions

- **Digital Twin** - Interactive recreation that models the industrial layout to intuitively access all the information stored in the factory.

- Visualization of data related to the traceability of the customer's products, as well as indicators related to the manufacturing process and other indicators relevant to the sector
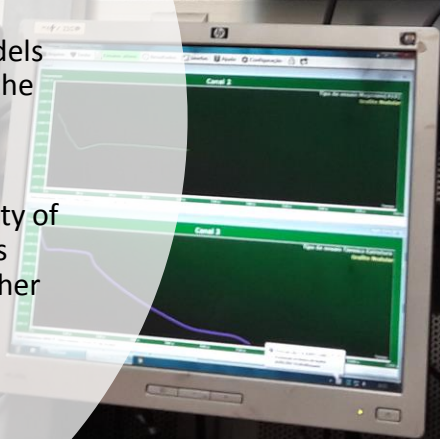
| INDUSTRY 4.0

Digital Security

Complex surveillance and risk management systems to enable security workers to efficiently track and control possible intrusions, alerts and breakdowns.

The overall system integrates cameras, sensors and analogue and digital actuators that form a **customized middleware connection** with third party hardware like those
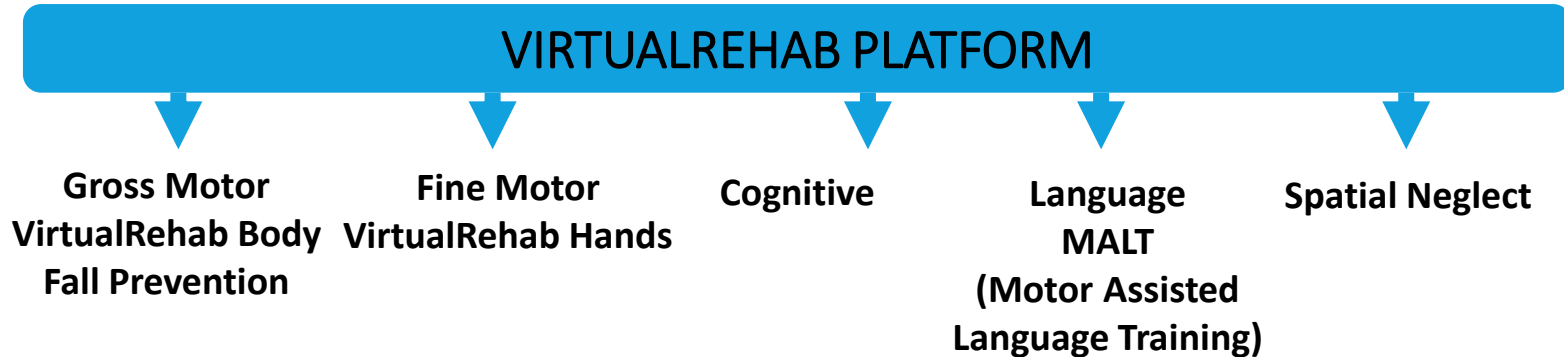
| eHEALTH

Solutions for physical and Cognitive rehabilitation for the Elderly

Market expectations

- the global **Physiotherapy** equipment **market** is valued at over 14.2B and is expected to **grow to over €20.8B by 2022**, while

- the global market for **Virtual Reality (VR) in healthcare** is projected to reach **€3.6B by 2020.**

Our goal is to provide healthcare professionals with `digital therapy` **tools** that fit seamlessly into a `multidisciplinary approach` to rehabilitation. Evolv offers a **suite of** `HW + SW products` that can be used to help treat a wide variety of neurological and physical conditions for different levels of ability. These products are linked to the VirtualRehab platform allowing their use by clinicians and their patients at **different phases of the care pathway** both in **clinical settings** and **in the home via telerehabilitation**.

VIRTUALREHAB PLATFORM

Gross Motor
VirtualRehab Body
Fall Prevention

Fine Motor
VirtualRehab Hands

Cognitive

Language
MALT
(Motor Assisted
Language Training)

Spatial Neglect

What is next?

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WAREHOUSE SCALE VR

Warehouse scale multiuser Virtual Reality solutions

| VIROO **CONCEPT**

WATCH

- Multiuser and **real scale VR room**
  - **Straightforward calibration and setup**
  - **Easy operation and maintenance**

- Networked users
  - **Absolutely tracked** with technologies as: NMERSO or VIVE Pro
  - **Remote control** of user's equipment and content

virtualware

Ceiling tiles

    passive **absolute reference** system with unique ID

Optical tracker

    identify those IDs and solve **positioning**

VR Ready computer backpack

    Rendering high quality **real-time graphics**

Wireless **communication**

Advantages:

    Low latency

    Constant complexity while scaling up

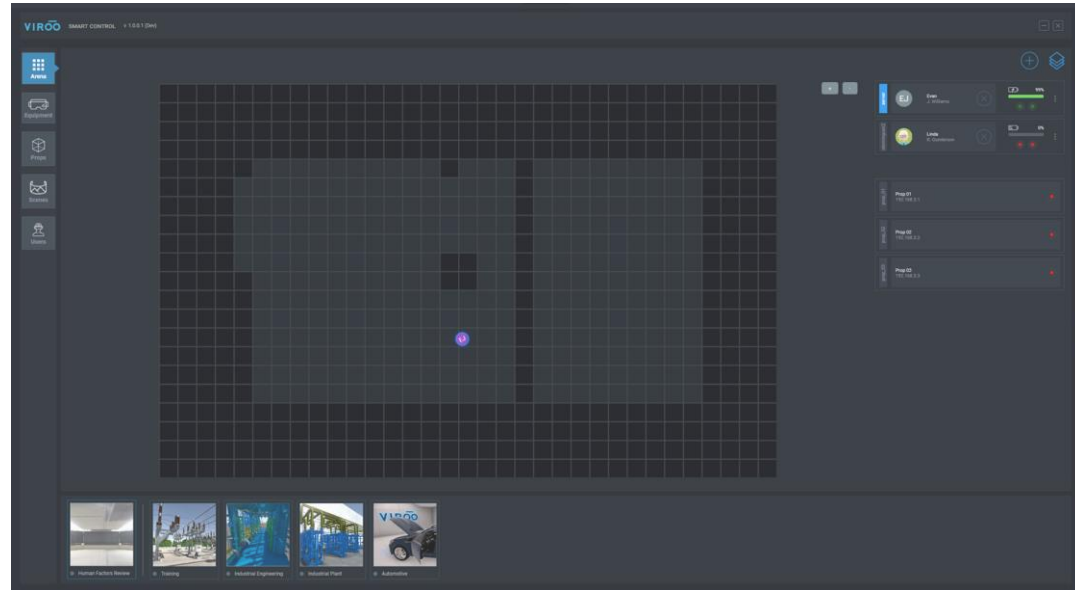   Each user solves its **own tracking**

Authoring Tool to control the immersive room and in the virtual environment

Manager:

- **Content** launcher
- **Users & Session** management
- **VR environment** control

Client

- **Content** visualization

VIRTUALWARE

| R&D CHALLENGES

Communications (5G, remote communications…)

Hardware (sensors, tracking…)

Interactive Technologies (HMI, UX Standardization…)

Use Cases (Creative Industries, Industry4.0, eHealth, ….)

VIRTUALWARE

Links

Subscribe to our **newsletter** at:

www.rockproject.eu

www.bologna.rockproject.eu

info@rockproject.eu

You Tube ROCK channel:

[https://www.youtube.com/channel/UCCnqIJ9RBiLz BEta4cykn-Q](https://www.youtube.com/channel/UCCnqIJ9RBiLzBEta4cykn-Q)

Rock project CODEC TV (ENG):

https://www.youtube.com/watch?v=Z5SChxf1SlQ

ROCK circle (ENG):

[https://www.youtube.com/watch?v=dvpYze7SfX4& feature=youtu.be](https://www.youtube.com/watch?v=dvpYze7SfX4&feature=youtu.be)

Malerbe timelapse:

https://www.youtube.com/watch?v=5fiYDEGKUI0