THE NEXT STEP TOWARDS IMMERSIVE COMMUNICATION

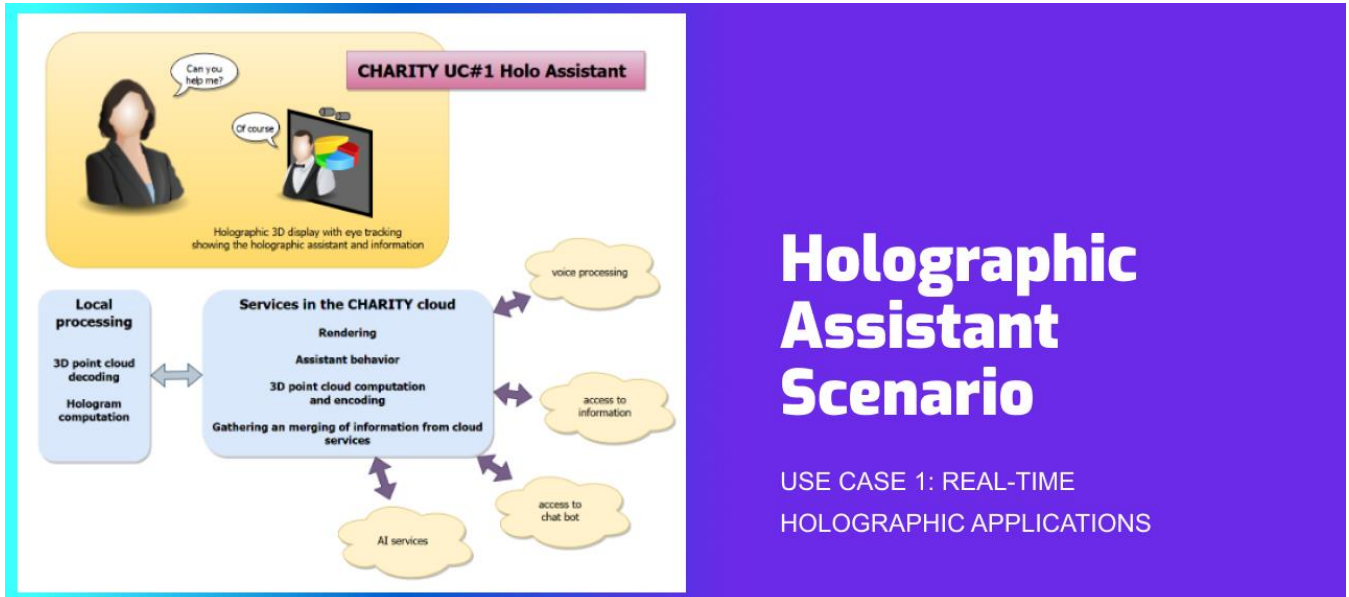Creating new business opportunities for European citizens, companies and scientific community

Advanced media applications enabling immersive communication are becoming ubiquitous in our lives. There is a global trend to adopt virtual solutions, e.g. Virtual Reality or Holography, to support day-to-day business operations, social events, and general lifestyle.

The current pandemic and the corresponding shift from physical to virtual communication highlight impressively what benefits we could gain from such immersive communications, but also how much effort is still needed to make them an everyday life service for everyone. The requirements for the computing platform and the underlying network are extreme and not easily achievable with today's technologies.

The CHARITY project has set off to address this challenge and to develop a complete framework that will meet the requirements of such applications. In this way, the CHARITY project is a major step towards achieving immersive communication. We have an excellent consortium of 15 organisations from 10 European countries ready to make it happen, and despite the pandemic we had a very productive first quarter after our kick-off.

Uwe Herzog, Eurescom,

CHARITY coordinator

The project will tackle these challenges developing three use cases with seven scenarios in total. In this newsletter, we will take a closer look at two of these scenarios:

CHARITY targets a holographic assistant use case, adopting the physical principles "diffraction and interference of light" to enable real 3D holography, based on very sophisticated custom optical components and algorithms. This lays the foundation for showing a butler-like avatar in 3D space on a holographic 3D display with true depth and true eye focus - for your eyes it is like natural viewing.

The butler shall react to natural language and assists by providing information gathered from the cloud or the internet. Beside the 3D holographic presentation, this use case enables a lot of sophisticated and challenging services and new technology to be developed and implemented in the CHARITY cloud - streaming 3D point cloud generation, handling and transcoding; speech recognition, synthesis and interpretation; access to and merging of different information sources and services - just to name some.

Enrico Zschau, SeeReal Technologies,

Use Case Scenario Owner

VR Medical Training Scenario

(Use Case 2 - Immersive Virtual Training)

For more than a decade, OramaVR has been providing revolutionary products that involve experiential simulation for medical training and assessment with cutting edge VR.

Empowered by the CHARITY 5G platform capabilities, ORamaVR's business case aims to deliver the power of its breakthrough technology, MAGESTM, to next generation collaborative cloud VR training application, tailored for untethered lightweight head-mounted displays (HMDs) distributed over different geo-locations. By migrating its high computational and storage components to the cloud, away from the HMD, and exploiting CHARITY's smart orchestration service for minimal latency synchronization, we will deliver an immersive multi-user experience.

Antonis Protopsaltis, ORamaVR,

Use Case Scenario Owner

CHARITY Architecture

CHARITY aims at the development of a holistic framework to support highly interactive and immersive services that are the basis for next-generation applications including VR/AR and Holography (suggested to be killer applications for the 5G and beyond mobile systems). To do so it considers the AI-based orchestration of different services and heterogeneous networks, edges and clouds to achieve the requirements and targeted KPIs that have been defined in the different use cases and reference scenarios.

The CHARITY Framework will pursue a microservice-oriented architecture in which functional blocks (standalone but loosely coupled software components) will interact through defined interfaces jointly with self-optimizing network slices based on ZSM and AI concepts that will support the dynamically adaptive and context aware CHARITY services. Besides this, CI/CD concept is a main driver for the architecture and technical design to allow a fast design and implementation cycle and short time to market for next-generation applications.

CHARITY's general architecture is organized into five main layers (from bottom to top):

- **End-user devices and multiple administrative clouds and edges,** the bottom layer.

- **Network Function Layer** (NFL) and CI/CD CHARITY framework components.

- **Network Slicing Layer** (NSL) aimed at providing network slice management for collaborative and interactive applications.

- The upper layer consists of two components, which are:
  - The **Application Management Framework** (CHARITY OSS)
  - The **Convergence and Abstraction Layer** providing end-to-end multi-domain network orchestration functions.

- **Network Security and User Privacy layer** is a cross layer that assess the security and privacy of the overall CHARITY architecture.

Fermin Calvo, PLEXUS, CHARITY

Communication Manager