# XR4LAW: Implementing an Immersive Ergonomic User Interface for Legislative and Deliberative Institutions - An Immersive Experience of Legal Documents

Giuseppe Di Maria, Shirin Hajahmadi, Salvatore Sapienza, Gustavo Marfia, Monica Palmirani

ALMA-AI, Università di Bologna, Bologna, Italy

## Abstract

XR4LAW is an innovative project included in the ERC project HyperModeLex that aims to investigate a new methodology of work of parliamentarians through the use of Virtual Reality (VR) and Mixed Reality (MR) technologies. XR4LAW creates a Virtual Dashboard, with the goal of integrating legislative work into the metaverse. The bidimensional metaphor used for navigating the legislative documentation is limited considering the complexity of the material that a member of parliament should navigate and search. For this reason, the current project intends to provide an immersive environment where to find relevant documents using an easy human-computer interaction interface. The application is connected to the eXist-db database, where all legislative documents are available in XML format using the Akoma Ntoso OASIS XML standard applied to the European legislation. The primary goal is to develop an ergonomic and intuitive user interface that capitalizes on MR's capabilities, such as real-world visibility and utilizing physical spaces to overlay virtual elements. This immersive environment empowers end-users to explore and analyze legal documents in a whole new way, improving the accessibility and efficiency of parliamentary work.

## UX

The development of the XR4LAW user interface focused on ergonomics and usability. During development, consideration was given to ease of placement of application elements in the space around the user and their effective display under all conditions [1].

## Egonomy

The XR4LAW interface is designed to keep the user at the center of the scene in a comfortable posture, positioning UI elements along the natural trajectory of their field of vision. This enhances interaction with the application and reduces physical and visual fatigue [1].

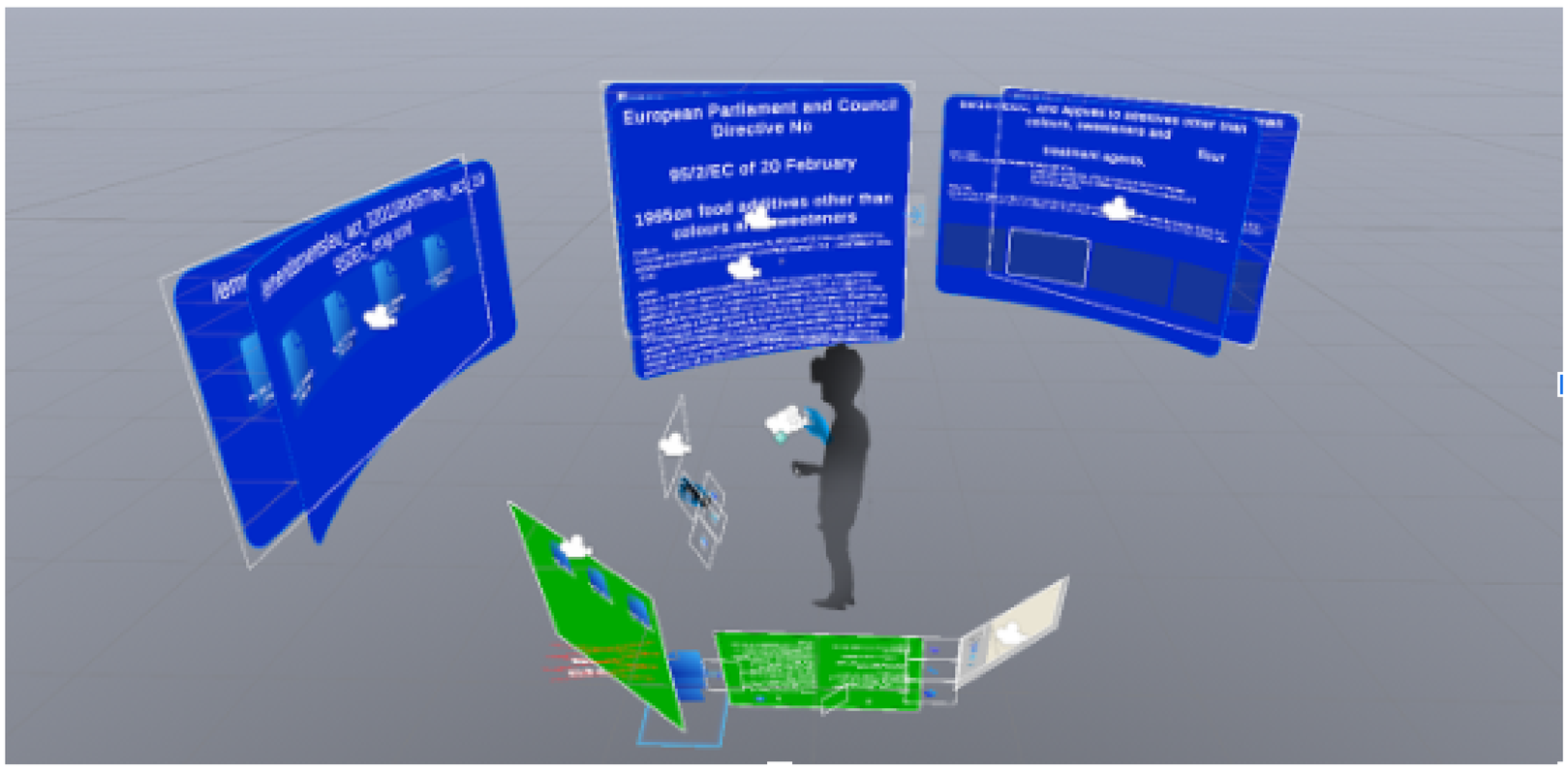
## Depth

XR4LAW exploits the concept of depth to create a hierarchy among virtual elements, enhancing the perception of user interface elements. This approach, together with smooth animations, improves usability and reduces disorientation and manipulating users' attention [1].

## Typography Color

XR4LAW is designed for document reading, aiming to improve readability and comfort. It uses a single font to ensure uniformity and clarity in the text. In addition, the background color of the virtual panel should contrast with the color of the text to facilitate reading [1].

## System Architecture




XR4LAW is a project under development on Unity, a graphics engine for VR and MR experiences. It is inspired by previous studies such as "Spaces to Think: A Comparison of Small, Large, and Immersive Displays for the Sensemaking Process." [2] and "Immersive Space to Think," [3] which explain the effectiveness of using and placing virtual panels within an immersive three-dimensional space, taking full advantage of spatiality. It allows connection to the eXist-db, a database where legal documents are stored in XML format according to the AKN schema, an international standard for representing executive, legislative, and judicial documents. Users can navigate the eXist-db and access legislative documents directly in an immersive space, providing immediate and intuitive access.

## Conclusions

XR4LAW integrates immersive technologies into the legislative environment, leveraging VR and MR to improve access to legal documents. The project implements an ergonomic user interface to provide an intuitive and comfortable experience. This first prototype lays the foundation for future optimizations of the system, opening new avenues for the use of immersive technologies in the legal field.

## Acknowledgements

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