nst National Research Council of Science & Technology

Introduction to Open XR Platform Development for High-level Immersive Collaboration

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KAIST

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KIOM

Background

- Demand for XR technologies for efficient education, industrial processes and medical care is increasing
- Many countries(including USA, China) invest in XR technology in National level
- Global companies are securing core technologies with preemptive investment

Environmental Change

- Increase of non-face-to-face collaboration in education, industry and medical care

1000% increase in MS Teams usage

* 「Remote work trend report」, Microsoft, 2020.04

- Online 2D collaboration is limited in communication and interaction with time and space constraints.

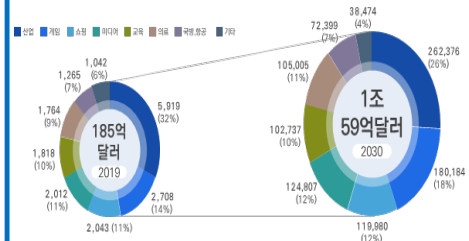
Change in Demand

- Increasing requirements for the level of service quality (information sharing, natural conversation)

High-quality XR collaboration for unconstrained data sharing, natural conversation and industrial use in space and time

Market

Rapid growth of the XR Industry



2030년 전세계 XR 시장 1조 59억 달러 규모 예상, 교육 산업 의료 시장은 전체 47%

*자료: 「Global Extended Reality(XR) Market」, Prescient & Strategic Intelligence, 2020

Emergence of New Industry

Needs

Overcoming the limitations of current technologies and services

Development of Core technologies for Digital Twin and Metaverse

Limitations of technology

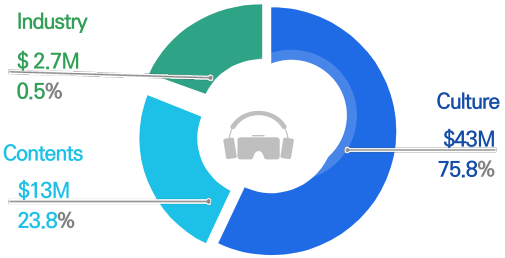
- Realistic communication and multi-party collaboration on XR collaboration platform is difficult
- It is difficult to implement high-quality collaboration with low-latency due to computing power and wireless network bandwidth limitations

The demand for high-quality collaboration in various industries

Providing a sense of social and physical co-presence in interaction

Limitations of Content and Service

- Main area: entertainment and game
- Lack of high quality contents and services

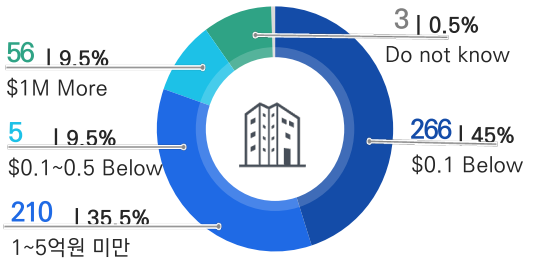


Sales(AR/VR Content): More 57 % → Game

Need to develop high-quality, high-precision, Low-latency technology

Company

- Small and medium size companies



Need to increase the size of private sector

Open platform technology

Improvement of co-presence in non-face-to-face environment

Development of high-quality, open and interactive XR platform technology

Problem Definition

Target

Improvement of co-presence in non-face-to-face environment
Development of high-quality, open and interactive XR platform technologies

Core Value

Open Platform

Support for multi-party, multi-discipline immersive collaboration

- Support for various execution environments (multi-device and OS support)
- Support for Hall scale XR space that accommodate multiple simultaneously
- Development of Open APIs
- Support for multiple concurrent collaborative interactions

High-quality Immersion

Visual, auditory and tactile interaction technology

- Interactive technology btw immersive devices
- Interaction technology
- I/O technology

Social Co-presence

Improvement of social co-presence

- Participant co-presence expression technology (creation of avatars in multiple types and expression of emotions and behaviors)

Multi-field demonstration of XR service

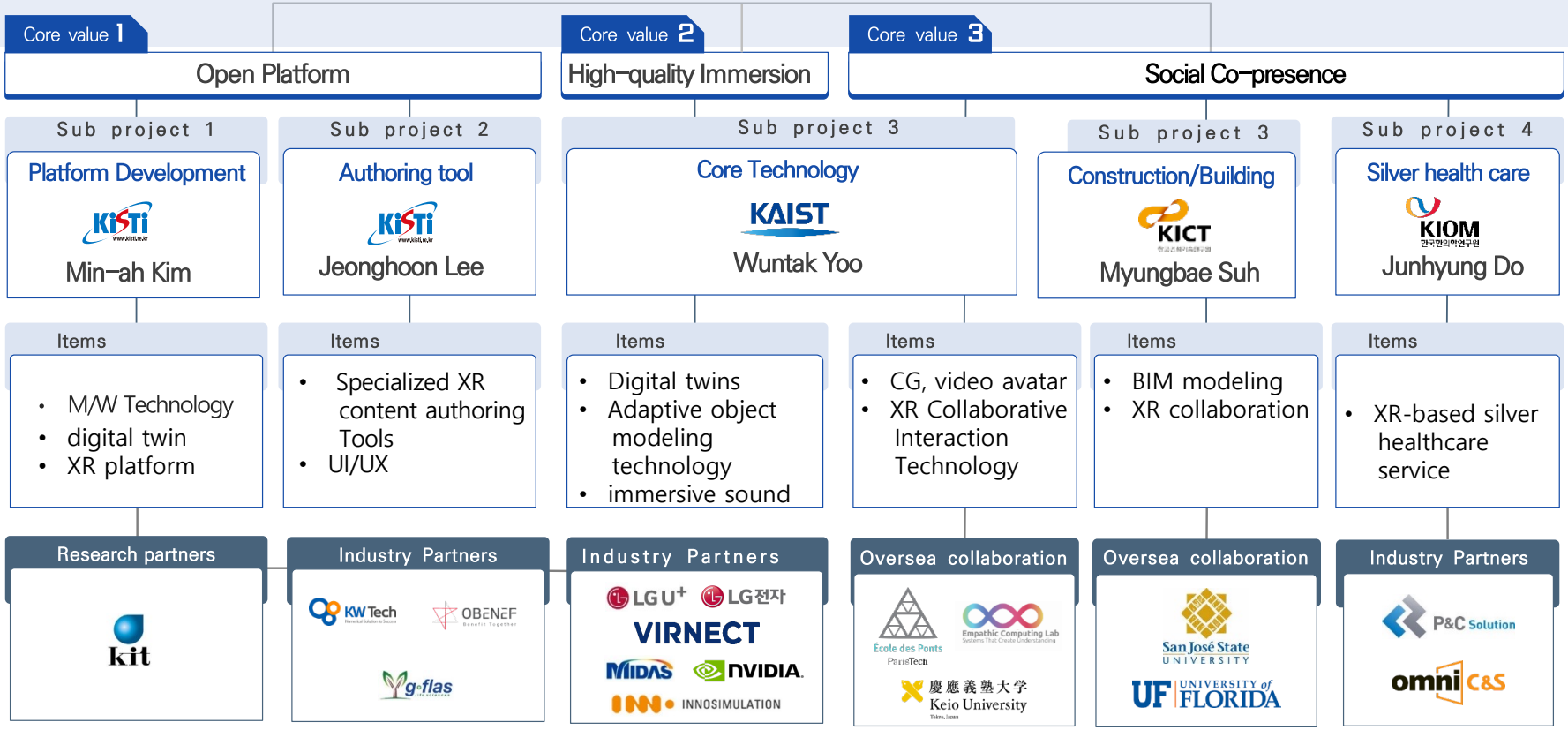
- Development and demonstration of pilot services such as education, collaboration, and medical care

Evaluation of social co-presence improvement technology

- Development of co-presence measurement index and research on co-presence optimization UI elements

Project Overview

Project title	Open XR Platform Development
PI	Kum Won Cho, KISTI
Funding Agency	nst National Research Council of Science and Technology
Budget	$41M (6 years), Start: Dec. 1. 2021



Goal

Development of a high-quality, immersive XR collaboration platform that enables multi-party collaboration and real-world interaction even in heterogeneous and asymmetric environments

AS-IS

Status

- Real world interaction limited Cooperation
- Expression of coexistence difficult CG avatars
- few room scale meeting
- high cost, high delay, low quality

Issue

- Unable to apply and utilize industrial sites
- Small number of companies
- Increasing the cost of creating XR collaborative content

TO-BE

Development and demonstration of a high-quality open XR collaboration platform

Technology	High-quality Immersive Tech. ⊕ Open XR Platform ⊕ Target-based API Development ⊕ HPC
Core Value	Development of XR collaboration platform capable of high quality in multi-type/multi-party/multi-discipline even in heterogeneous asymmetric environment Highly immersive heterogeneous/multilateral collaborative interaction by providing an optimal coexistence space based on digital twin Demonstration of services in education/collaboration/medical field by developing multi-modal collaboration interaction technology and various elements to improve coexistence
Key Performance	**(Best One) An open platform for maximum number collaboration(High-quality)** **(First One) Innovative, highly immersive XR collaboration technology** **(Only One) Field applicable XR technology**
Effect	Industrial Use / XR Eco-system / XR Research Env. / Core technology for Metaverse

Scenario(2027)

Thank you for Attention