



*eXtended Reality for All*

# Current State of XR Technologies & Applications, and Ethical Aspects

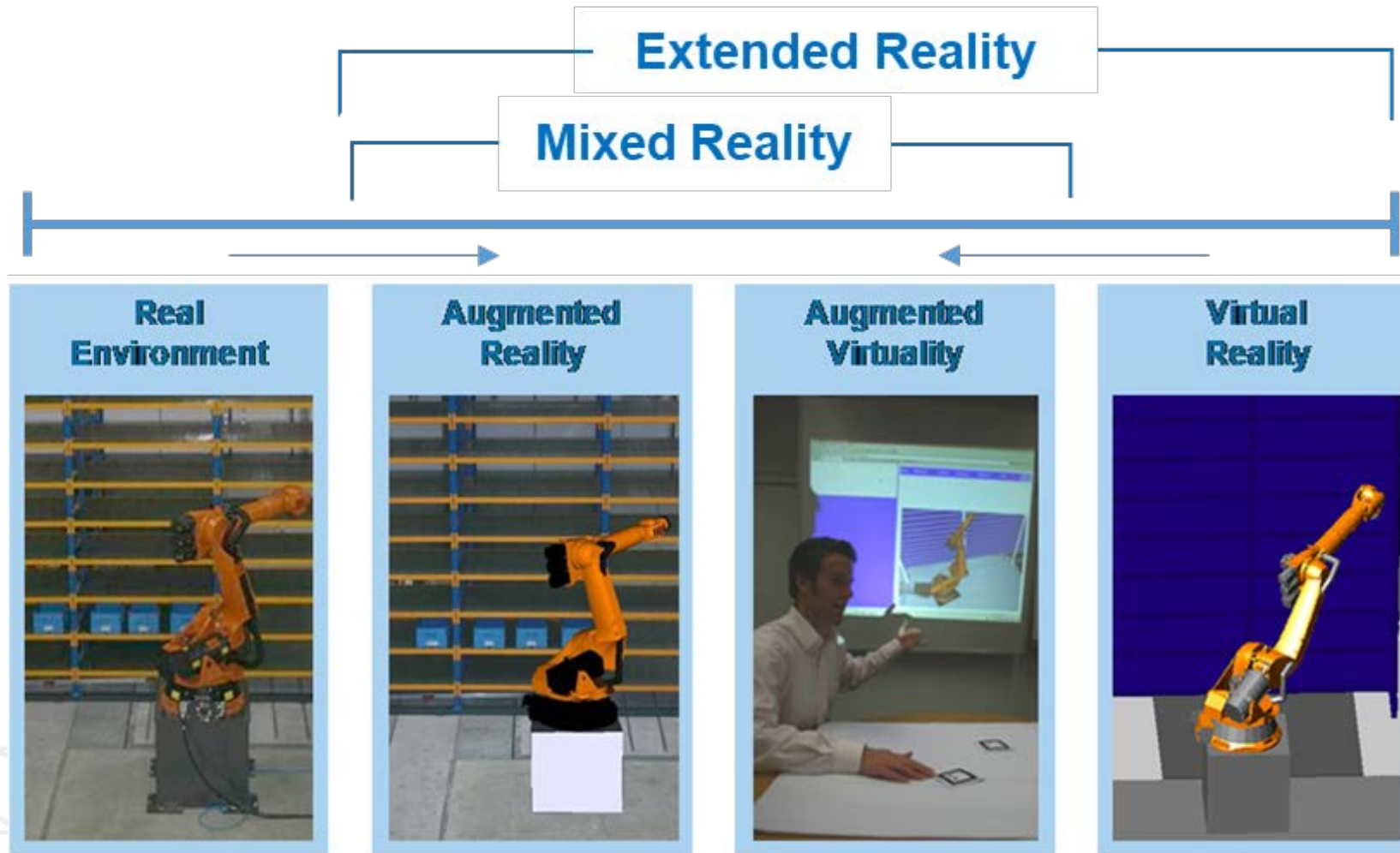
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EU XR Forum, 12 December 2019, Brussels



- Map research activities landscape and review ongoing research activities in XR on a global and European level to categorize the research activities and identify gaps
  - Landscape Report completed by 30 November 2019
  - Publication upon approval by the commission
- Develop a concrete research agenda for the coming 3-5 years and a vision for the research in the next 5-10 years
  - Draft research agenda completed by 30 November 2019
  - Some key findings presented today

# The scope of eXtended Reality

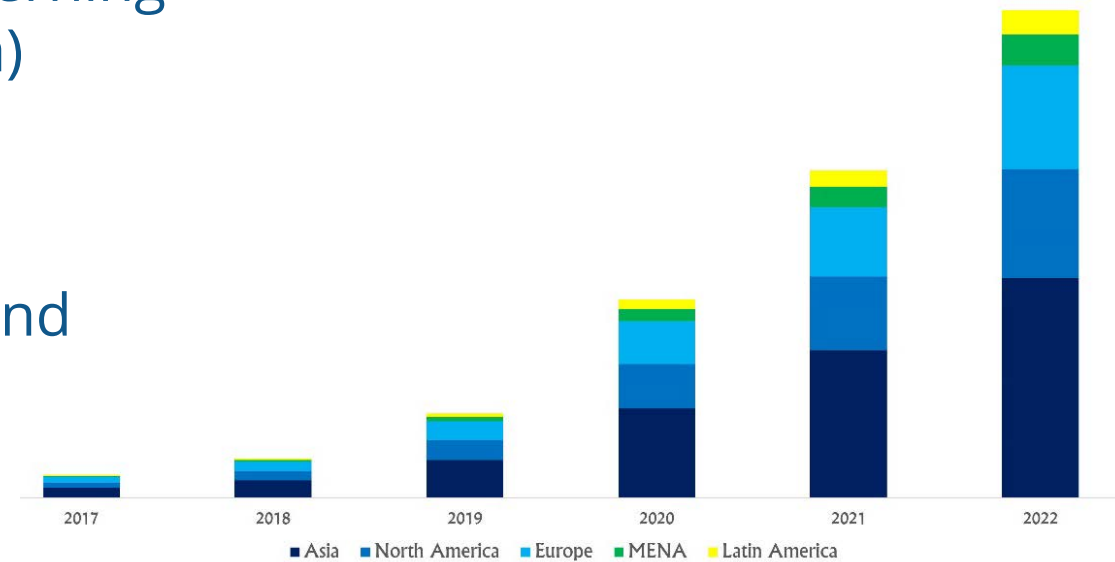


# How did we approach the XR community?

- Online survey in Sept./Oct. 2019
  - More than 90 participants
- Expert interviews
  - 8 experts interviewed for one hour each
- Luncheon at VR Days Europe, Amsterdam
  - 26 experts at round table discussions

- Europe is expected to be at 2<sup>nd</sup> position concerning world wide revenue in XR market (after China)
- Four major areas for XR applications: repair, maintenance, design and assembly
- Followed by: immersive training, inspection and quality assurance
- VR more focussed on entertainment use cases and revenue streams such as in games, location-based entertainment
- AR more on e-commerce, advertisement, and enterprise applications
- European innovation in AR and VR is largely driven by SMEs and start-ups

AR/VR regional revenue



- XR technologies will enter all fields of our daily life, either private or business
- Availability of XR hardware is more affordable and can also be used more easily by technology users and consumers
- Most of the head-sets are tether-free and allow for easier installation and use
- 360 degree cameras are no longer expensive and provide relatively good quality
- Significant advances in the field of spatial computing, inside-out-tracking, and especially hand and gesture tracking
- Some first prototypes on 5G technology and edge computing are available

- Acceptability of XR devices
- AR headsets need to be more robust
- Tracking of body parts and sensing the environment
- Convincing haptic interfaces
- Need to define guidelines and tools for improving storytelling
- Lack of open interfaces
- Missing open ecosystem
- Common platform required offering trust and data security

- XR technologies will be implemented for daily use
- Form factor of headsets will improve and their price will decrease
- AI and Deep Learning algorithms might run in the devices
- 5G will enable cloud-based streaming of XR solutions
- More verticals will use XR technology
- Real-time communication in 3D to support distributed working environments
- New regulations will be established to ensure privacy



- Technology and creative sector in XR are faced by a huge gender diversity problem
- Security and privacy is an important issue due to massive collection of user data by XR devices
- XR technologies will have strong impact on future communication and social relations
- Access to technology is still limited (hardware costs, missing attractive content)
- A risk for dual-use remains as for every new technology

→ Concrete actions are defined in the report for each of the issues

- Horizon Europe should have much less administration and shorter period between proposal submission and grant agreement
- Funding schemes dedicated to start-ups needs with provision of smaller grants
- Accelerator funding dedicated to XR should be supported
- Gender balance should be stated explicitly in future EC call text
- Create a European technology and collaboration platform to support networking
- Create a European open ecosystem to provide access to XR technologies and applications
- Create a European data platform, that offers trust and security for European industry
- More transdisciplinary collaborative research
- More platforms and events, where information and best practices are shared



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# SAVE THE DATE 5th & 6th March 2020 - Munich

Benefits of Interoperability, Standards and Research Agenda for XR

Joint Workshop with ISG ARF and the AREA  
Come and join the discussions!





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# Thank you for your attention!

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