

REALITY CHECK: The Importance of U.S. Engagement in Standards Development for Immersive Technology

WHAT ARE STANDARD DEVELOPMENT ORGANIZATIONS?

Standards development organizations (SDOs) draw on the expertise of representatives from industry, government, and academia to set specifications, guidelines, and requirements for existing and emerging technologies. This uniformity helps to enable safety, interoperability, performance, and access.

Thus, the stakeholders who participate in SDOs help to shape the innovation agenda and can impact investment and market entry. **Indeed, standards have a direct economic impact and are strategically important.** By influencing the standards of new and emerging technologies at a foundational level, those countries with robust participation can secure leverage over their competitors and gain lasting, self-propagating advantages.



XR TECHNOLOGY IN THE STANDARDS SPOTLIGHT



As a critical emerging technology, immersive technology (or “XR”) - which includes virtual, augmented, and mixed reality – is ripe for standards development. **SDOs are actively working on XR standards around integration, safety, interoperability, and data portability in addition to ethical standards and governance.** They are looking at the technologies and systems that will collectively form virtual worlds (aka, the metaverse) including digital twinning, multimedia integration, spatial computing, smart city technology, and security architectures.

U.S. ALLIES AND ADVERSARIES ARE ACTIVELY ENGAGED

Chinese entities are taking an exceptionally active role in SDO committees and working groups focused on immersive technology. Beijing has declared its intent to dominate the XR sector and has included steps to create an outsized influence over XR standards development in its various national and provincial strategies.

United States allies including South Korea, the UK, and the European Union have also identified XR standards development as critical to their competitiveness, and they have increased their engagement accordingly. Unfortunately, the U.S. is not well represented within SDO initiatives focused on XR and the metaverse. Indeed, the United States is trailing other governments in thinking about how to advance, integrate, and govern this transformational and rapidly advancing technology.

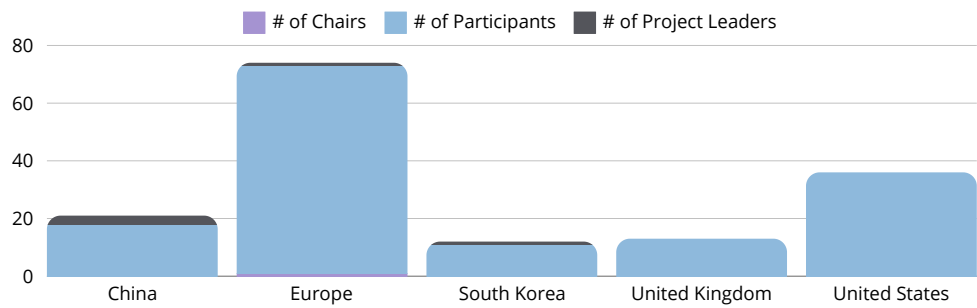


In the absence of a strong U.S. presence, competitors and allies alike are creating the standards that will shape the future of computing. The U.S. government should incentivize and enable increased stakeholder access to the standards process, thereby leveraging the tremendous strengths and expertise of the U.S. private sector, academia, civil society, and public sector. A failure to do so imminently risks a loss of U.S. influence in this critical sphere.

INTERNATIONAL ORGANIZATION FOR STANDARDIZATION (ISO)

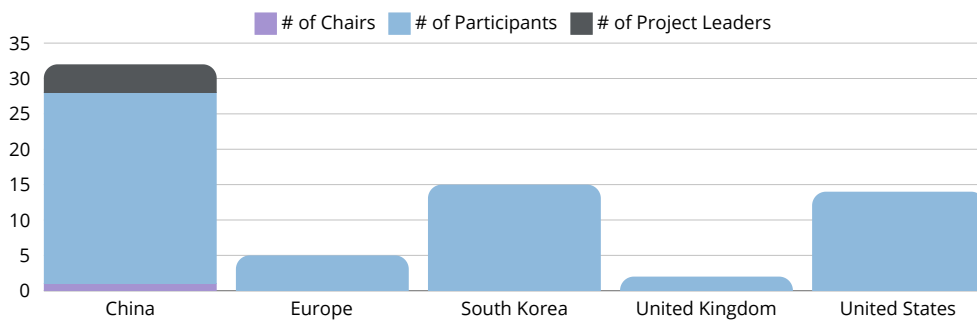
ISO/IEC JTC 1/Working Group 6: Digital Twin

Europe dominates participation in this group, with 72 total participants. The U.S. is second with 36. However, the U.S. is not a leader on any projects.



The ISO/IEC JTC1/SC41 WG 6 endeavors to standardize the burgeoning field of digital twins, establishing common frameworks and protocols essential for interoperability and advancement.

ISO/IEC JTC1/SC 43: Brain Computer Interfaces Working Group 1 - Foundation Standards



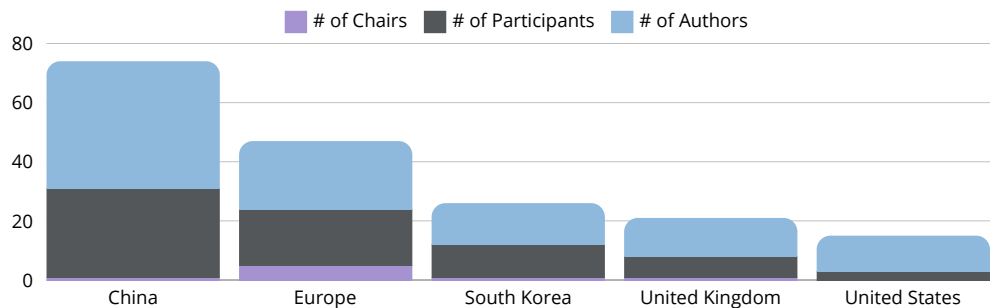
While the U.S. has the third most participants in this working group, it has not led any projects. China is the leader on all four of the projects currently underway.

The ISO/IEC JTC1/SC43 is developing the essential vocabulary, foundational standards, and reference architectures necessary for interoperability, innovation, and ethical standards in BCI technology. BCI is used with XR devices to assist users who have physical limitations.

INTERNATIONAL TELECOMMUNICATION UNION (ITU)

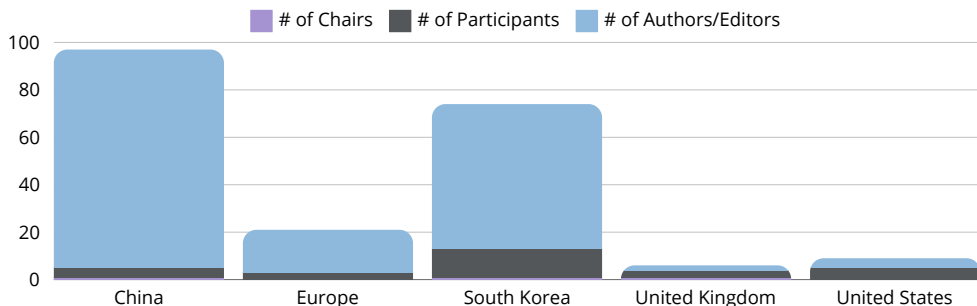
ITU - Metaverse Focus Group

Among the 29 technical reports published by the ITU Metaverse Focus Group, China has 43 authors, while the U.S. has 11.



The ITU Metaverse Focus Group was established to analyze the complex technical landscape and requirements of the metaverse. In particular, the group is studying foundational technologies such as multimedia systems, network optimization, digital currencies, Internet of Things, and digital twins.

ITU-T Study Group 17: Security

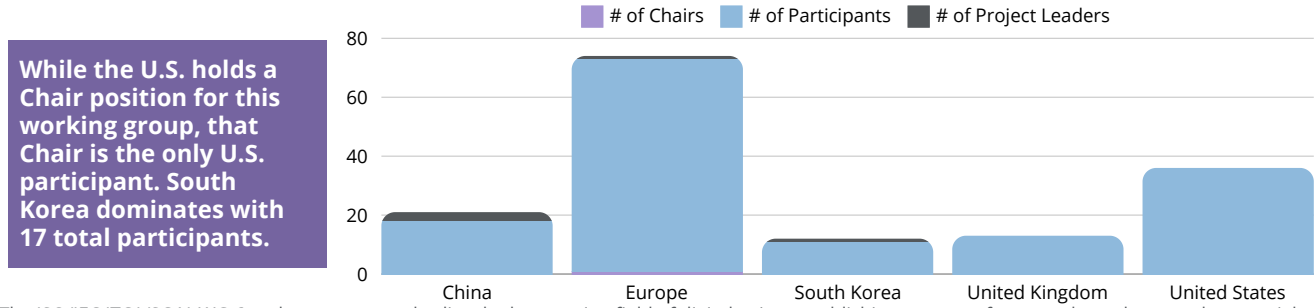


China has 92 contributors to this group's projects. South Korea has 61. The U.S. has 4.

ITU-T SG17 for security works on a broad range of matters in the cybersecurity space that will directly impact the metaverse. Among the most crucial are identity management, biometrics, and child online protection.

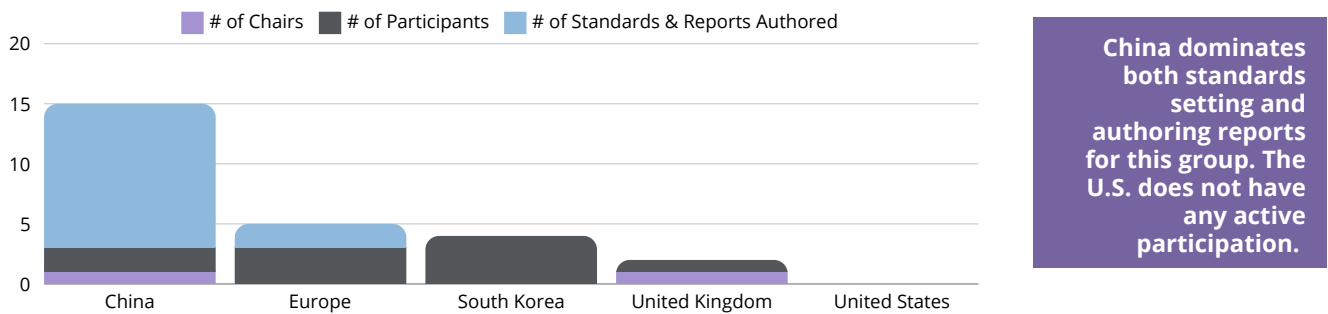
INTERNATIONAL ELECTROTECHNICAL COMMISSION (IEC)

IEC Technical Committee 100/Working Group 12: Multimedia Systems and Equipment for Metaverse



The ISO/IEC JTC1/SC41 WG 6 endeavors to standardize the burgeoning field of digital twins, establishing common frameworks and protocols essential for interoperability and advancement.

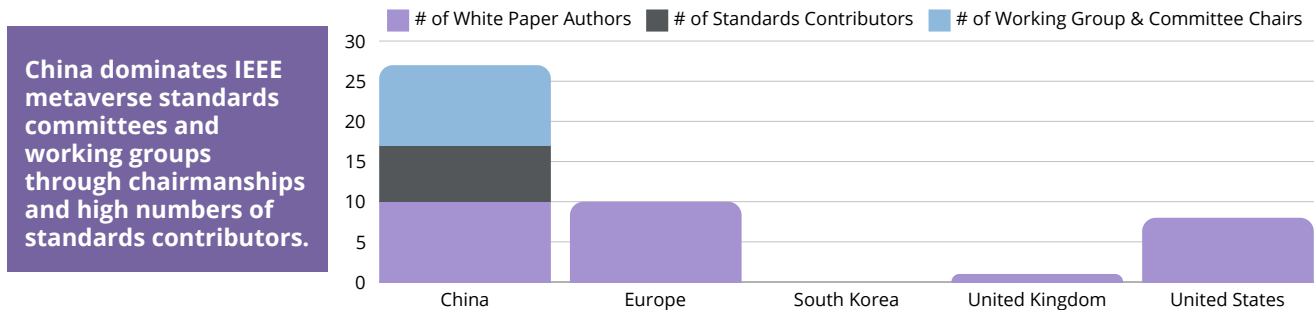
IEC SyC Smart Cities: Electrotechnical Aspects of Smart Cities (Urban Modeling and Digital Twins)



The IEC SyC Smart Cities group was established to foster the development of standards in the field of electrotechnology to help with the integration, interoperability, and effectiveness of smart city systems worldwide. XR technology plays an important role in smart cities through applications including transportation and mobility; public engagement and participation; and infrastructure planning and maintenance.

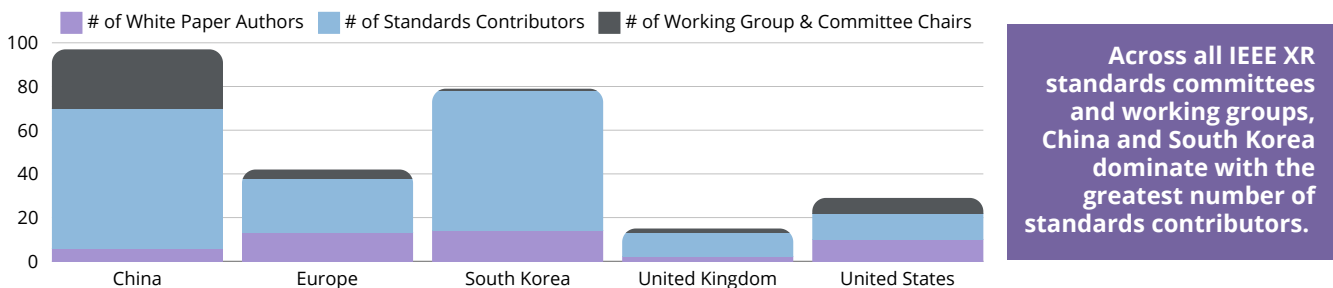
INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS (IEEE)

IEEE Metaverse Congress and Initiatives



IEEE metaverse standards committees and working groups set guidelines for virtual environments and author white papers on various issues including terminology and definitions; identity and privacy; and infrastructure and decentralization. Under the umbrella of the Metaverse Congress, these IEEE groups and initiatives inform the ethical, social, and economic considerations around metaverse development.

IEEE XR Standards and Committees and Working Groups



In addition to its work on the broader concept of the metaverse, IEEE addresses issues related to the underlying XR technologies themselves. Among the technical areas considered are user interfaces; pixel density and resolution; and interoperability between virtual objects and physical space. These groups also look at user safety and wellbeing, as well as ethics questions.

STANDARDS ORGANIZATION	WHO THEY ARE & WHAT THEY DO	WORK ON IMMERSIVE (XR) TECHNOLOGIES
<p>International Organization for Standardization (ISO)</p>	<p>The ISO is an independent, non-governmental organization made up of members from the national standards bodies of 170 countries that develops and publishes global standards. These standards play a key role in ensuring the quality, reliability, safety, and sustainability of products and services across international borders.</p>	<p>The ISO is developing standards for the metaverse and related emerging technologies in areas such as security, privacy, user experience, and interoperability. These efforts are aimed at establishing guidelines to ensure that XR technologies can be safely and effectively integrated into key sectors, including education, healthcare, and entertainment.</p>
<p>International Telecommunications Union (ITU)</p>	<p>The ITU is a specialized agency of the United Nations responsible for matters related to information and communication technologies (ICT). The ITU develops the defining technical standards that ensure seamless interconnectivity and interoperability of ICT systems worldwide. ITU membership consists of technology professionals from 193 countries and over 1,000 companies, universities, research institutes, and other international organizations.</p>	<p>The ITU is engaged in pioneering efforts around the metaverse, and immersive technologies including digital twins. Through its study groups, the ITU is addressing critical aspects of standardization, connectivity, interoperability, accessibility, and privacy within the sector.</p>
<p>International Electrotechnical Commission (IEC)</p>	<p>The IEC is a not-for-profit, international organization that develops standards for a vast range of technologies, ensuring compatibility, safety, and efficiency across devices and systems. IEC membership is comprised of the national standards associations that represent specific countries. The American National Standards Institute (ANSI) represents the U.S. at the IEC.</p>	<p>The IEC has an important role in shaping the future of immersive technologies, with efforts focused on standardizing aspects of the metaverse and enabling XR technologies to work across different platforms and applications.</p>
<p>Institute of Electrical and Electronics Engineers (IEEE)</p>	<p>The IEEE is a professional association comprised of over 460,000 individual members from more than 190 countries. Members include students, academics, experts (engineers and scientists) and allied professionals. The IEEE is the leading developer of the international standards that underpin many of today's telecommunications, information technology, and power-generation products and services. The IEEE produces 30% of the world's literature in electrical, electronics, and computer engineering fields.</p>	<p>The IEEE is driving standardization efforts to pave the way for the metaverse, from technical issues, to socio-technical and ethics considerations. While the ITU focuses on infrastructure, the IEEE takes a more application-oriented approach to emerging technologies.</p>