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Welcome to the VRinSight Training Programme

Module C Country Comparison

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Welcome to the VRinSight Training Programme

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VRinSight Training Programme & Curriculum

The following lecture is just one in a series of lectures as part of the *VRinSight Curriculum*

The aim of this training programme for **HEIs** is

- to help you get aquainted with the technology of Virtual Reality
- demonstrate how VR technology can enhance Higher Business Management Education
- enable you to integrate VR technology into your own coursework and lectures
- enable you to introduce VR technology to your colleagues and demonstrate how VR technology can enhance coursework and lectures

Each learning session is complimented by practical work in the *VRinSight Interactive Classroom*

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VRinSight Training Programme & Curriculum

The following learning session is just one building block in a whole range of learning sessions as part of the *VRinSight Curriculum*

The aim of this training programme for **SMEs** is

- to help you get acquainted with the technology of Virtual Reality
- demonstrate how VR technology can enhance business management
- enable you to integrate VR technology into your business operations
- enable you to introduce VR technology to your colleagues and demonstrate how it can enhance their business operations

Each learning session is complimented by practical work in the *VRinSight Interactive Classroom*

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VRinSight Training Programme & Curriculum

- Module A: Outcomes of European survey of SME and Higher Education institutes
- Module B: Virtual Reality for Business and SMEs
- Module C: A comparison of VR developments around the globe
- Module D: Pedagogical considerations in Virtual Reality Learning
- Module E : Step by Step Guideline to good VR practice
- Module F : Introduction to the 25 VR applications of the *VRinSight Showcase*

All Curriculum Modules and the European Survey report are available in their entirety at the project homepage www.vrinsight.org

All 25 VR applications are accessible via the *VRinSight Interactive Classroom*

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Module C:
A comparison of VR developments around the globe

Learning objective:

- status que in generally in relation to VR technology
- public acceptance of the technology
- integration of virtual reality technology into education level and
- individual technologies adopted for education
- integration of virtual reality technology into business
- the accompanying government policy and investment
- Compare regions with European developments

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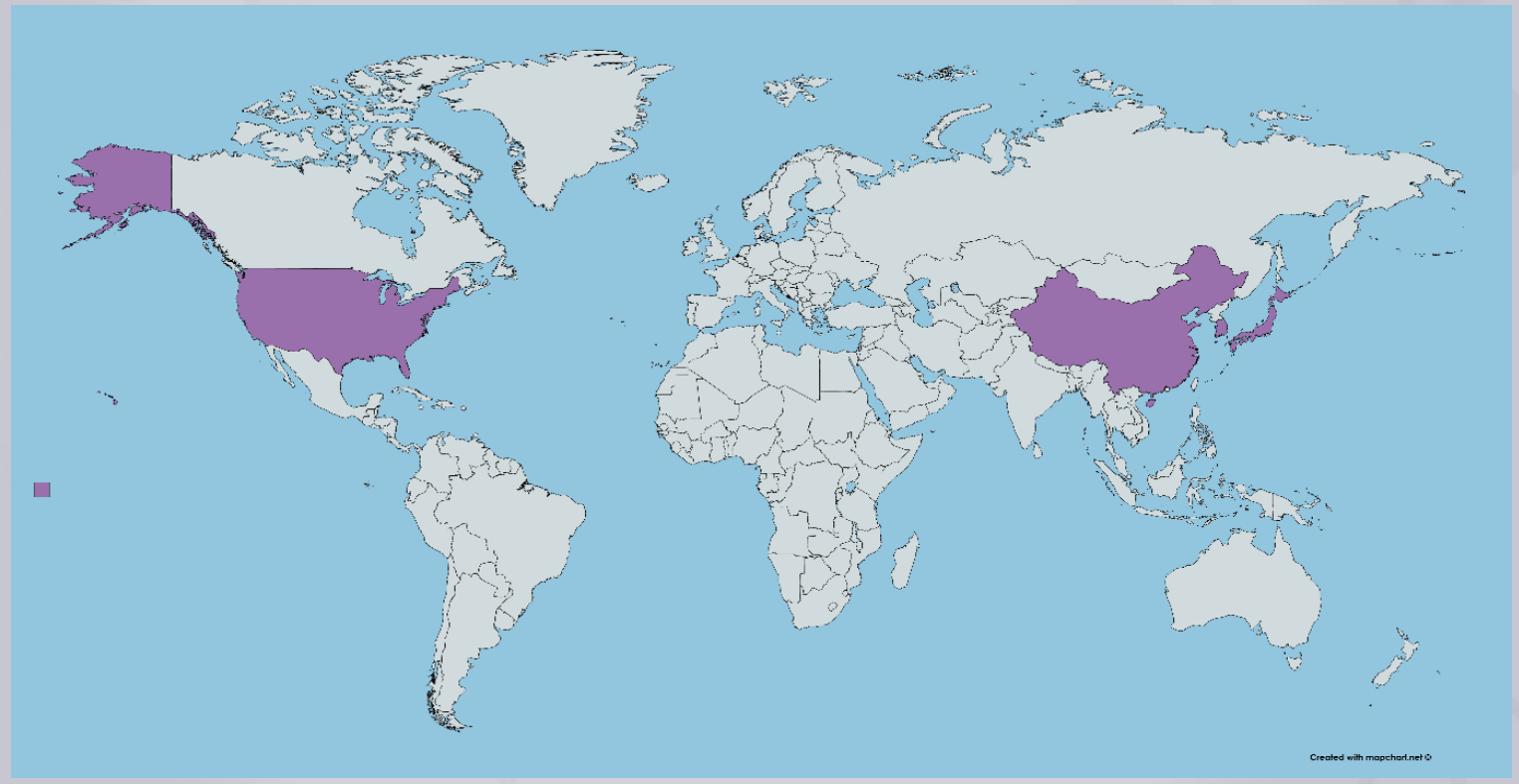
Regions of Study: based on country market share of VR technologies



(Created with mapchart.net)

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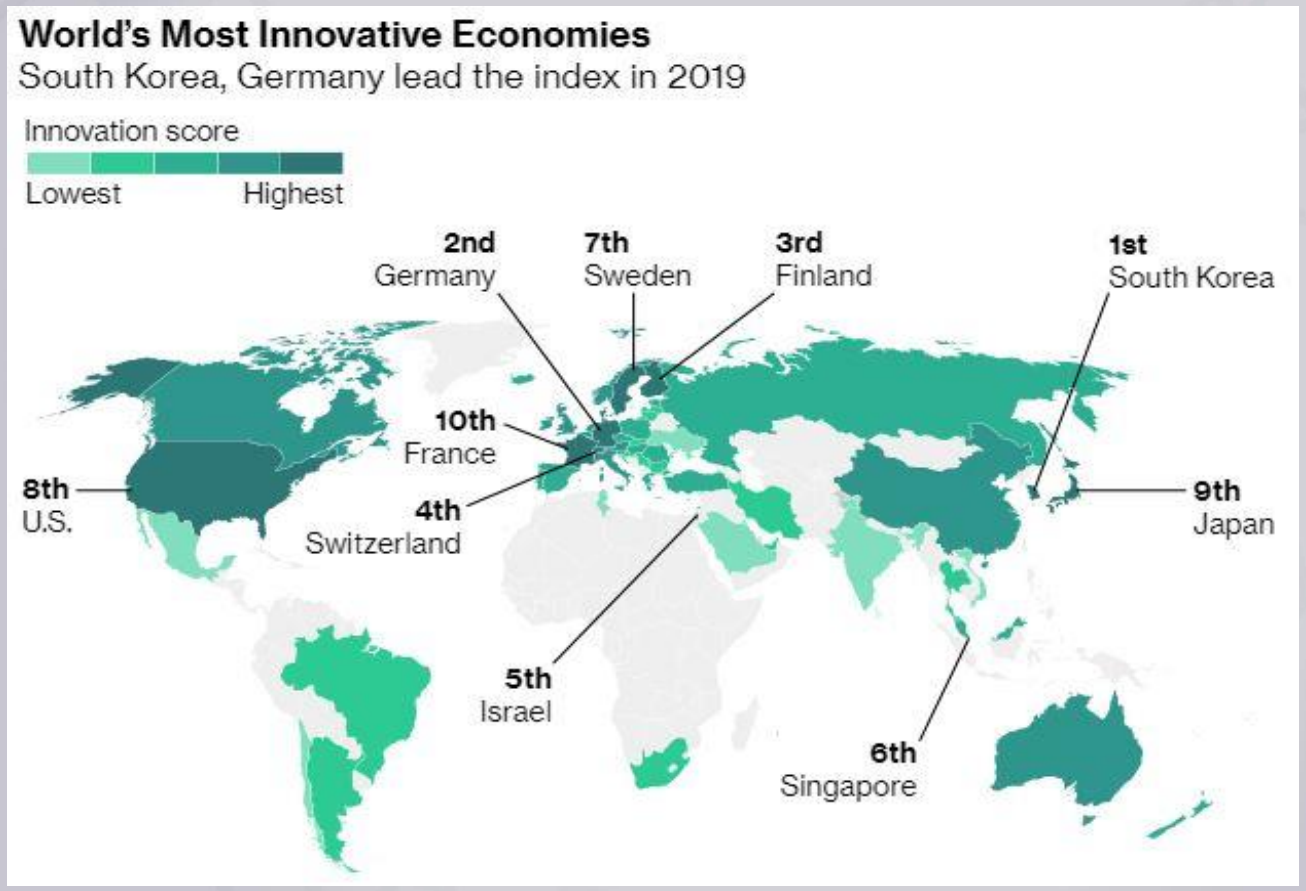
Global Status Quo:



Source: https://www.bloomberg.com/news/articles/2019-01-22/germany-nearly-catches-korea-as-innovation-champ-u-s-rebounds

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Global Status Quo:

USA and China dominate the VR industry

- *USA is the leading region in the technology in terms of spending, valued in 2018 at $6.4 billion*
- *Asia/Pacific (excluding Japan) is the next biggest spender with $5.1 billion estimated in 2018*

Petrov, C. 2019, *35 Virtual reality Statistics That Will Rock The Market In 2019*

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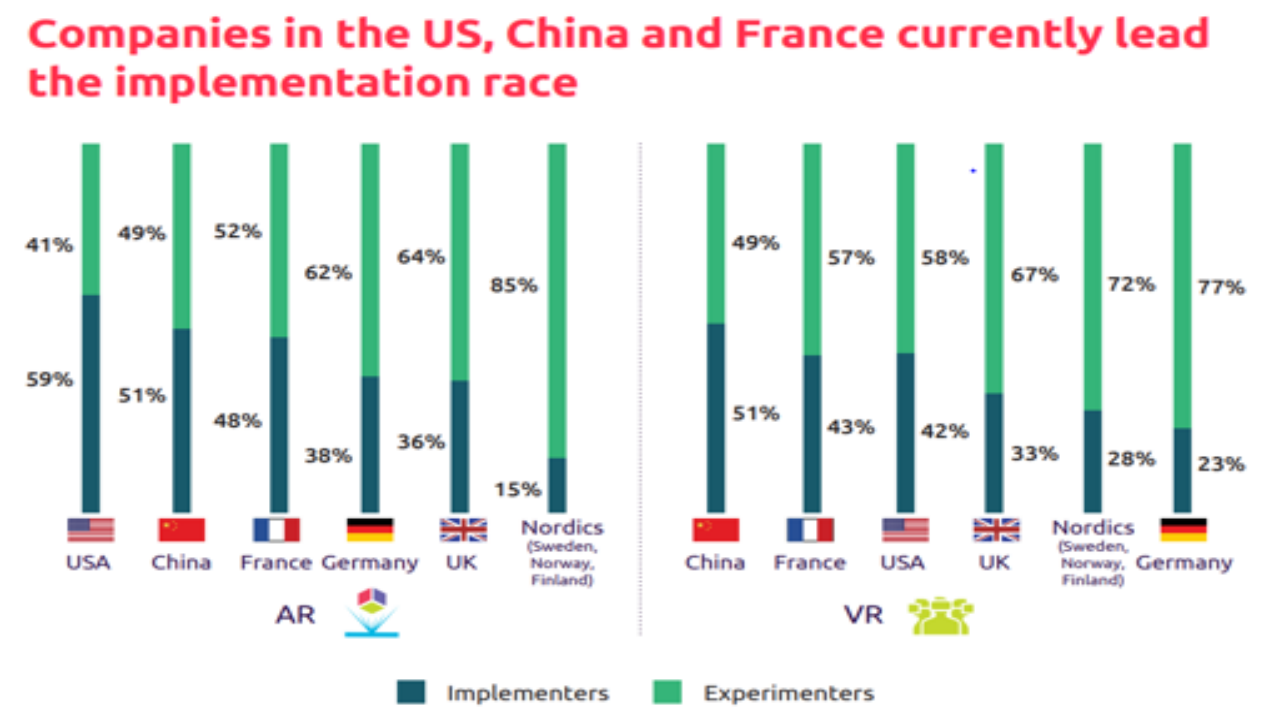
Global Status Quo:

USA and China as leaders when it comes to implementing VR technology into the business operations of existing companies.



Capgemini 2018, *Augmented and Virtual Reality in Operations*,

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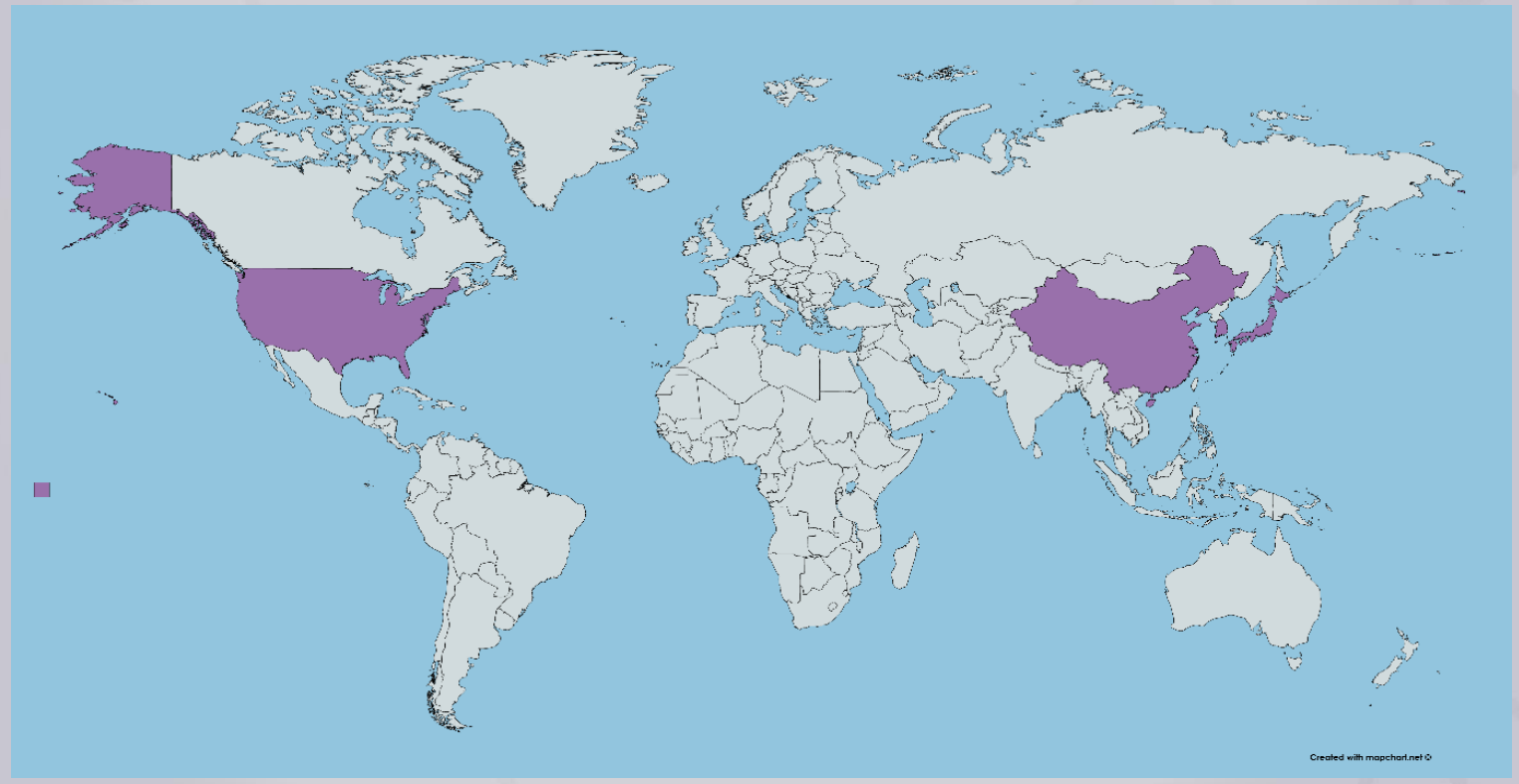
South Korea



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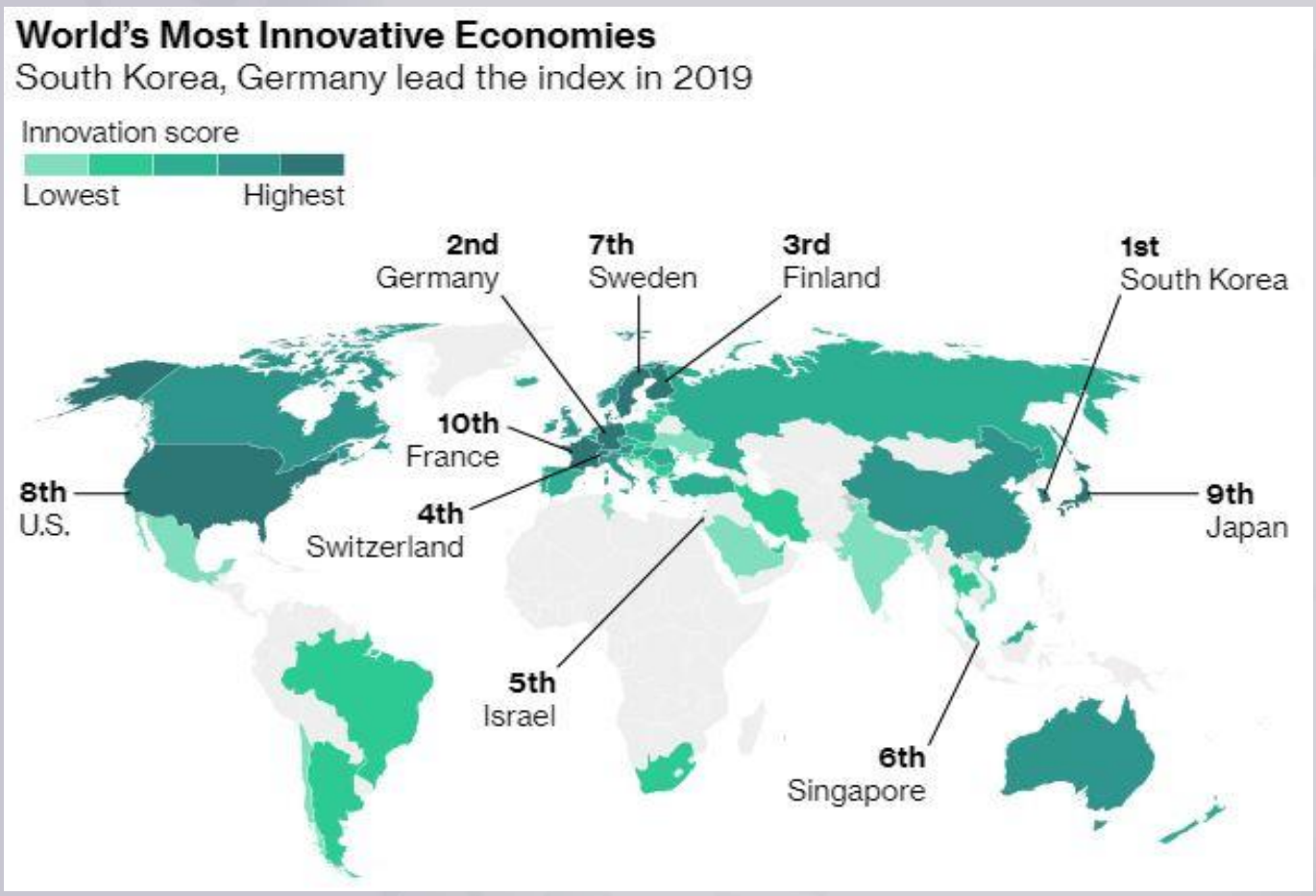
South Korea



SAMSUNG

Source: https://www.bloomberg.com/news/articles/2019-01-22/germany-nearly-catches-korea-as-innovation-champ-u-s-rebounds
Source: https://www.cgtrader.com/3d-models/electronics/other/samsung-gear-vr-sm-r323n

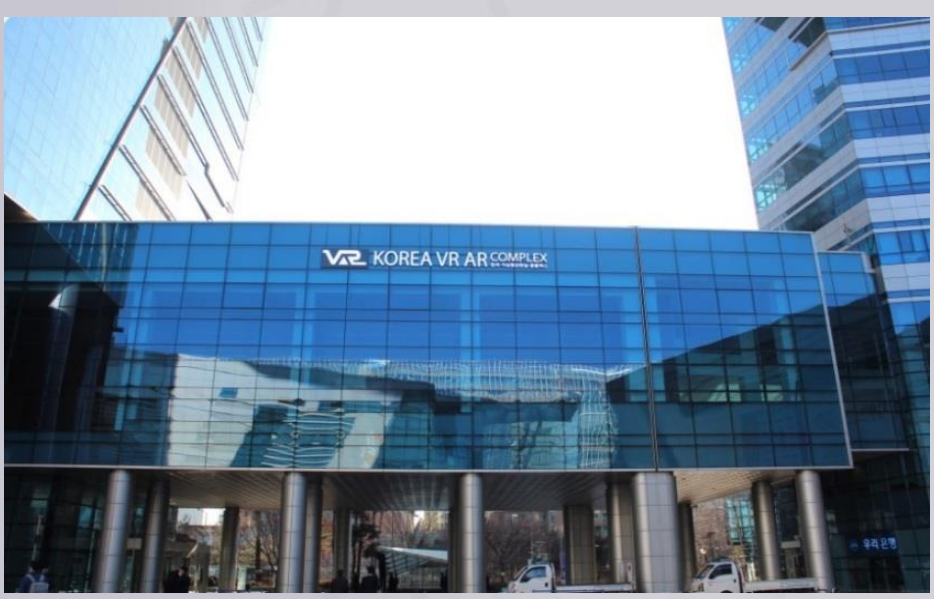
South Korea

- Culturally in South Korea there is a wider acceptance of technology and its advantages
- Cultural acceptance supported by government policy
- promote IT skills through the Ministry of Science and the establishment of Korea's National IT Industry Promotion Agency.

South Korea

Government's broader plan to invest more than $350 million until 2021 in developing new and indigenous VR and AR technologies

The KoVAC center in Seoul



Source http://koreabizwire.com/s-korea-to-open-2-more-vr-ar-complexes/88338)

VR campuses across the country in future to:

i) train and educate students in the latest VR

i) offices for VR start-ups and SMES

South Korea

- ENGAGE virtual reality platform to a set number of students in South Korea over initial 3 year period

VRinSight Showcase # ENGAGE
showcases\VR_IO2_VRshowcase_ENGAGE.docx
https://engagevr.io/
Source: https://engagevr.io/use-cases/educate/

South Korea - ENGAGE

Source: https://engagevr.io/use-cases/educate/

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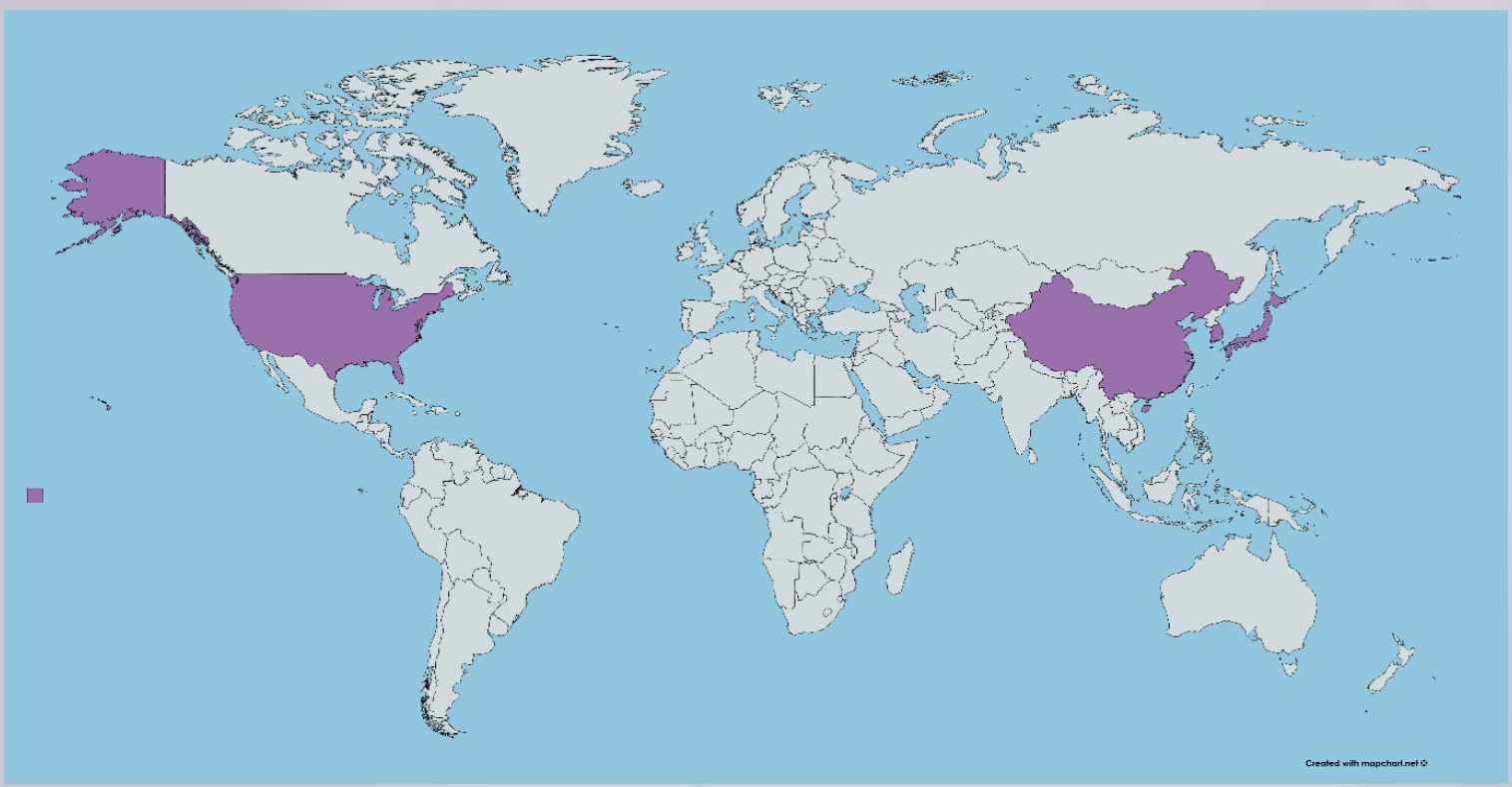
USA



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oculus

Google

Microsoft

USA

- *USA is also the region with the largest AR/VR spending globally and the spending valued was estimated in 2018 at $6.4 billion.*

Source https://techjury.net/stats-about/virtual-reality/

- *over 50% of survey companies (220) across the USA are currently integrating VR/AR technology into their business operations*
- *In Europe, 50% of surveyed companies (390) stated that they are currently only experimenting with VR/AR ideas.*

Capgemini 2018, *Augmented and Virtual Reality in Operations*, viewed 29 August 2019,

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USA

San Diego State University

- Virtual Immersive Teaching and Learning (VITaL) 2017

Source: https://its.sdsu.edu/vital-the-future-of-immersive-learning-at-sdsu/

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USA

San Diego State University

- Virtual Immersive Teaching and Learning (VITaL)
  - Est. 2017
  - VR/AR technology can be implemented into lectures of different subjects and disciplines
  - skills and instruction for educators to use the equipment competently
  - enhances the students' capability to understand the subject matter
  - VR & AR headsets, 360-degree cameras, Google expedition sets, and a venue to accommodate large groups.

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USA

San Diego State University

- Virtual Immersive Teaching and Learning (VITaL)

  Course so far……..

  - Mechanical Engineering – Introduction to Engineering Materials, College of Engineering
  - Management Information Systems Analysis –College of Business
  - Communications – Persuasion –College of Professional Studies and Fine Arts
  - Hospitality & Tourism Management – Commercial Recreation & Attractions Management, College of Professional Studies and Fine Arts

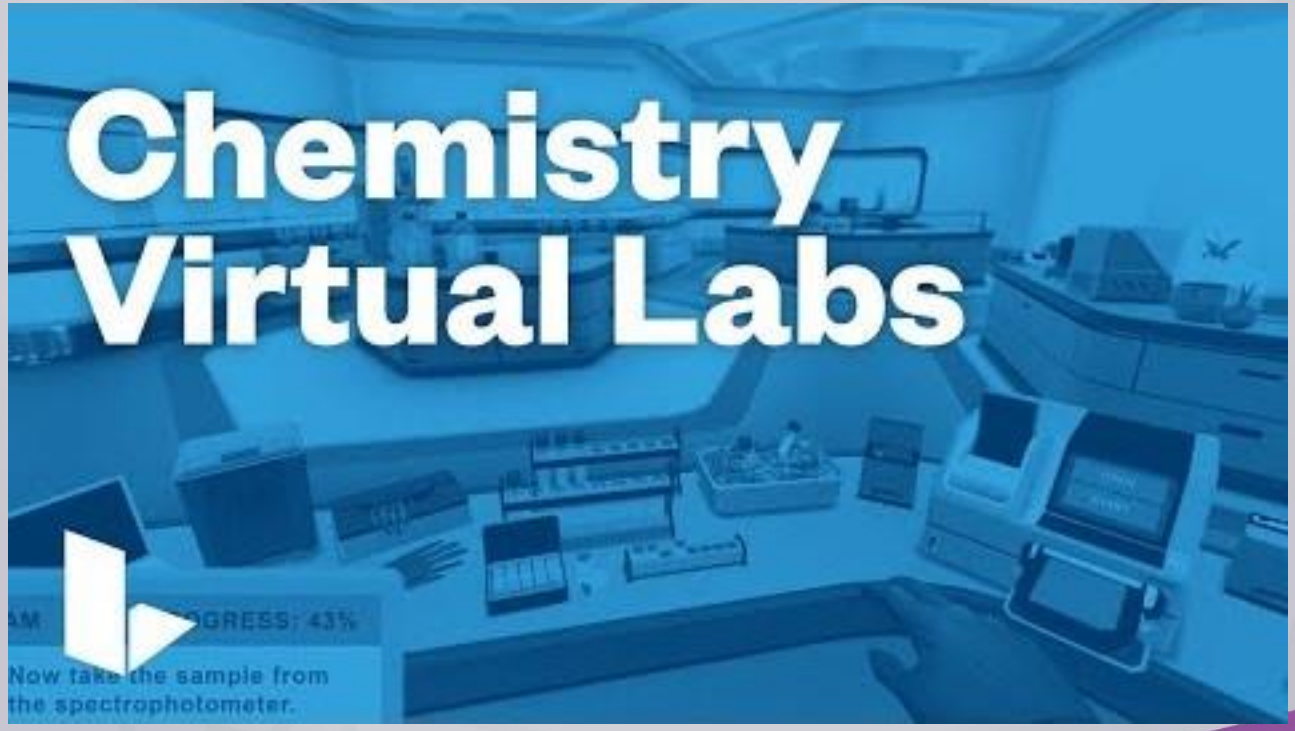
-

USA

SDSU - Virtual Immersive Teaching and Learning (VITaL)

USA Labster

- VRinSight Showcase Labster



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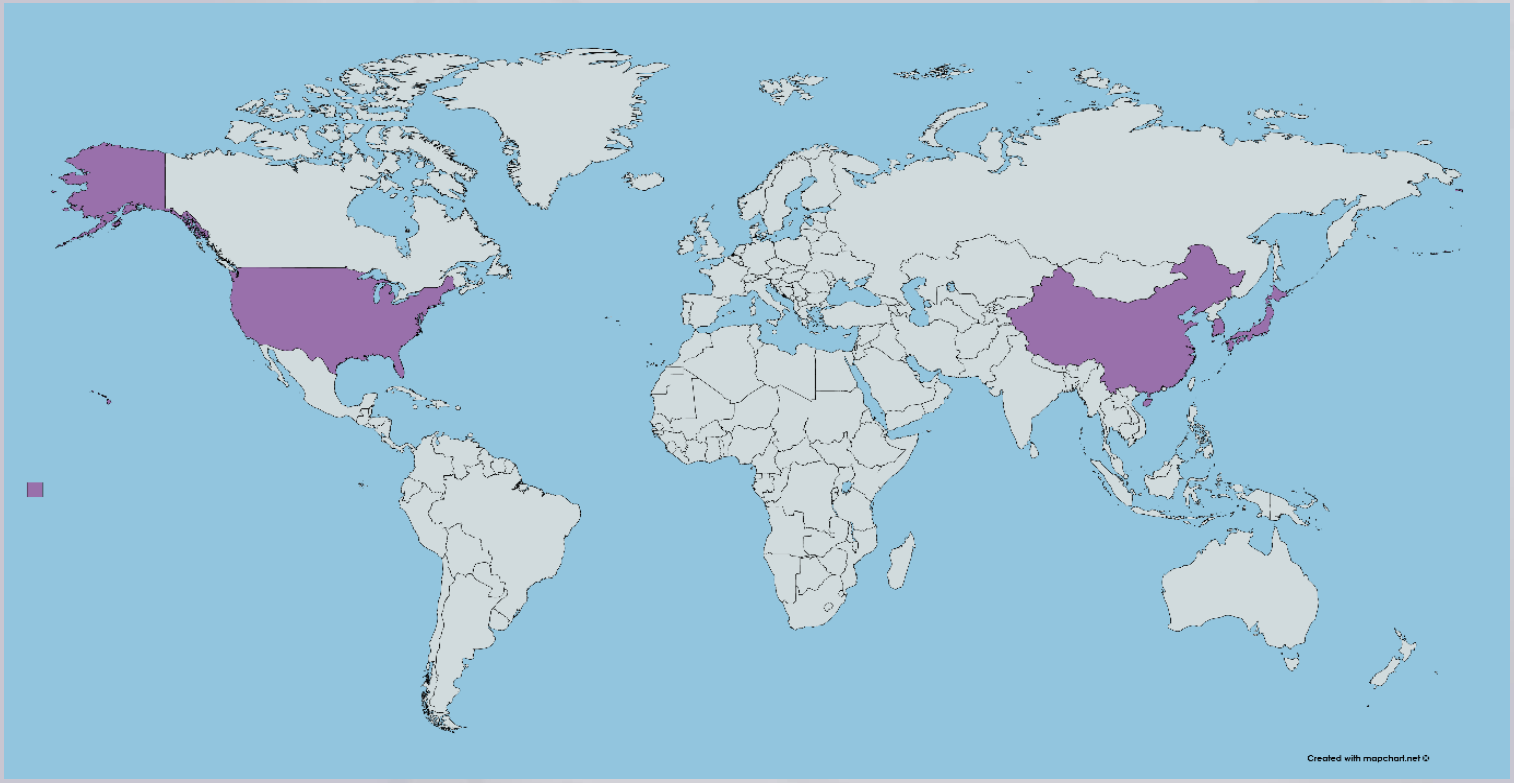
CHINA



HUAWEI

htc

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CHINA

- *"Scientific and technological innovation holds the key to development … The new round of scientific and industrial revolution with Internet at its core is gathering momentum, and new technologies such as artificial intelligence and virtual reality are developing by leaps and bounds. The combination of the virtual economy and the real economy will bring revolutionary changes to our way of work and way of life …"*

*X*i Jinping, General Secretary of the Communist Party of China
B20 Summit in Hangzhou in 2016

CHINA

- investment in AR technology has increased to almost 4 billion dollars in 2018
- 50 % of surveyed companies (100) in China are currently integrating VR/AR technology into their business operations.

Capgemini 2018, *Augmented and Virtual Reality in Operations*

CHINA

- China in 2018 accounted for over 80% of global VR headsets purchases
- HTC company campaign to launch almost 3000 VR arcades (VIVE VR Cafés)

Source: https://www.forbes.com/sites/charliefink/2017/12/19/vrar-in-china-an-emerging-giant/#347ee2af7573

CHINA

- VIVE DU – VR class management system

- locker for each headset,
- recharges and updates
- hygienically cleans headset before

Source: https://www.roadtovr.com/htcs-new-vive-focus-headset-locker-aims-put-vr-forefront-education-china/

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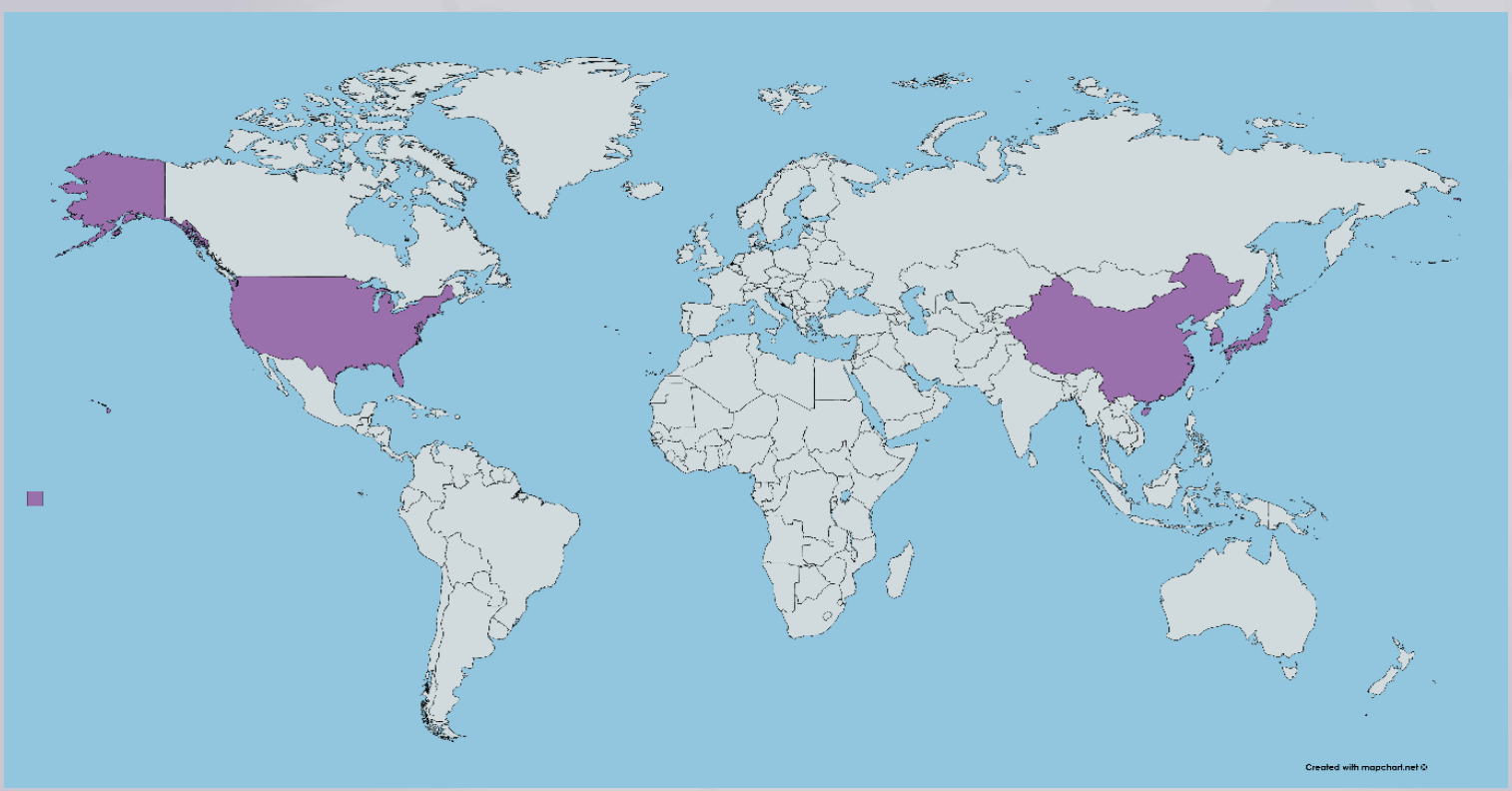
JAPAN



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SONY

TOSHIBA

Nintendo

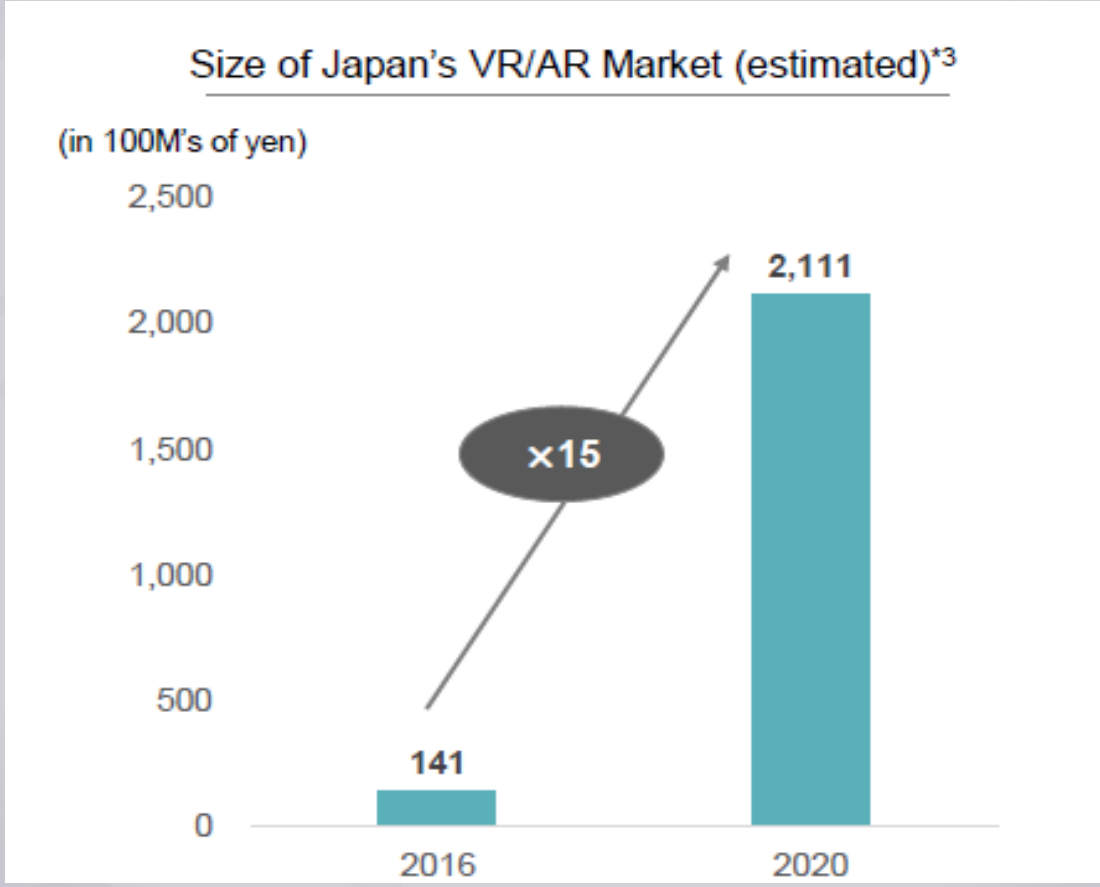
FUJITSU

JAPAN

- For example in 2017, the Ministry was supporting VR development projects up to approx. 10 million Yen (€850,000)
  - *JETRO* Japan External Trade Organisation 2017
- establishment of trade associations and consortium across the VR sector in japan

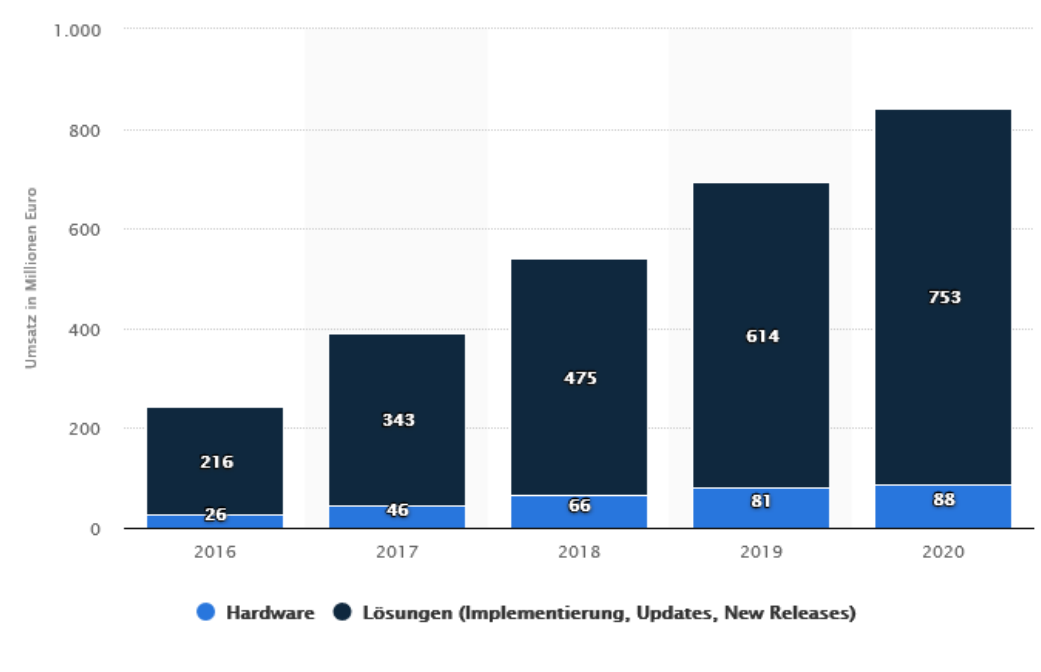
Source: https://de.statista.com/statistik/daten/studie/578467/umfrage/prognose-zum-b2b-umsatz-mit-virtual-augmented-und-mixed-reality-in-deutschland/

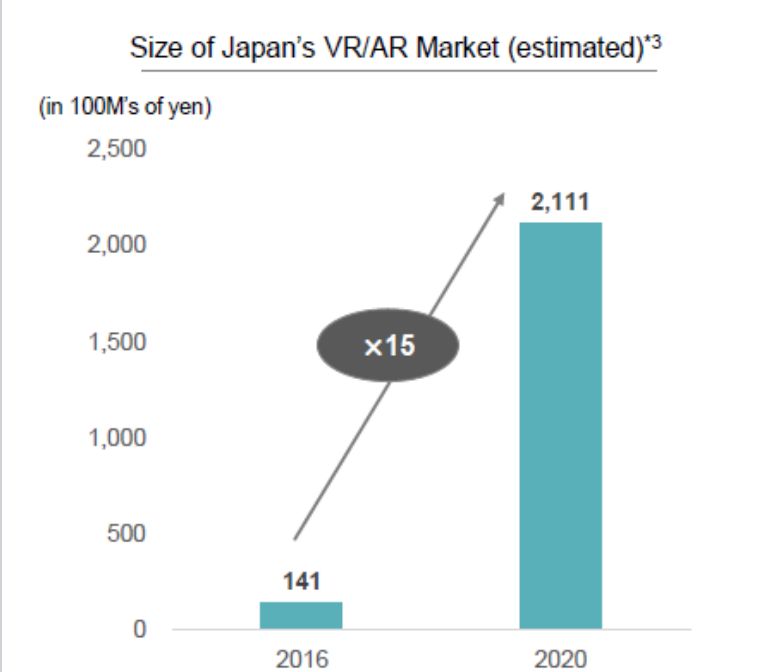
JAPAN



Source: JETRO Japan External Trade Organisation 2017 Market Report, VR/AR Industrial Solutions

JAPAN

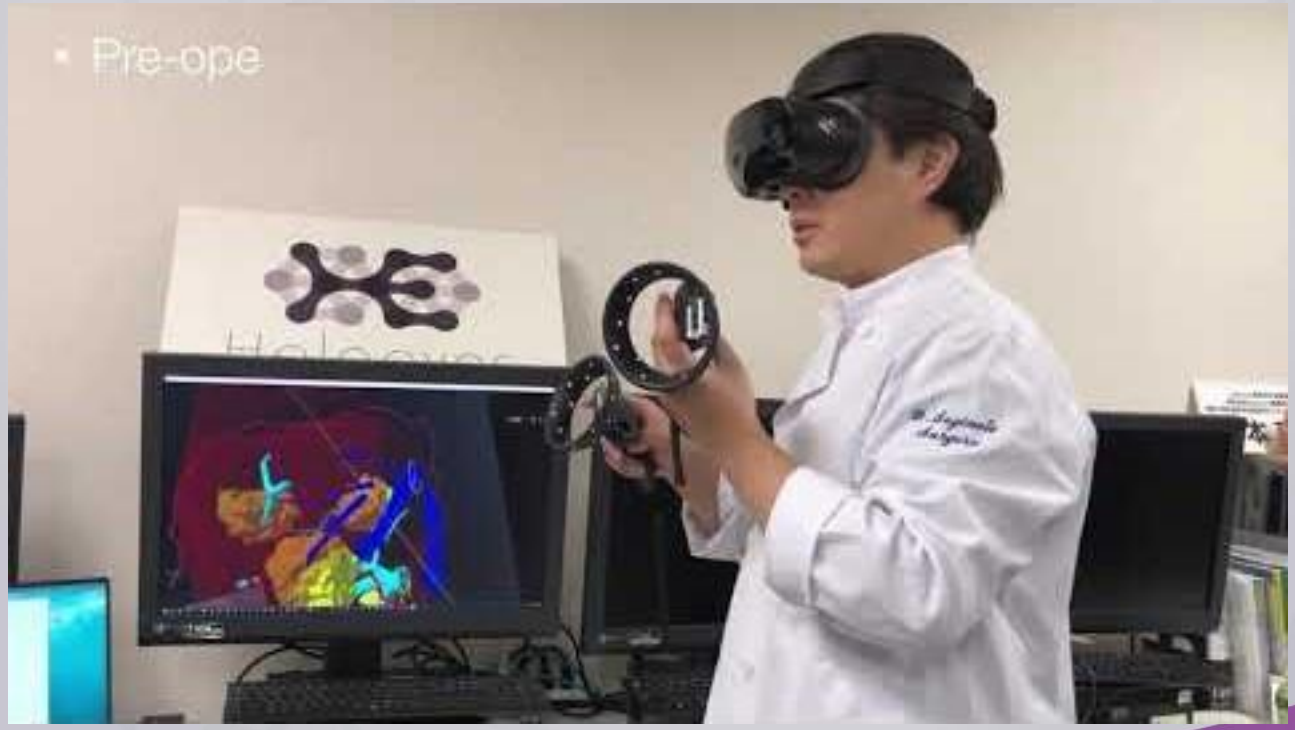




Source: https://de.statista.com/statistik/daten/studie/578467/umfrage/prognose-zum-b2b-umsatz-mit-virtual-augmented-und-mixed-reality-in-deutschland/

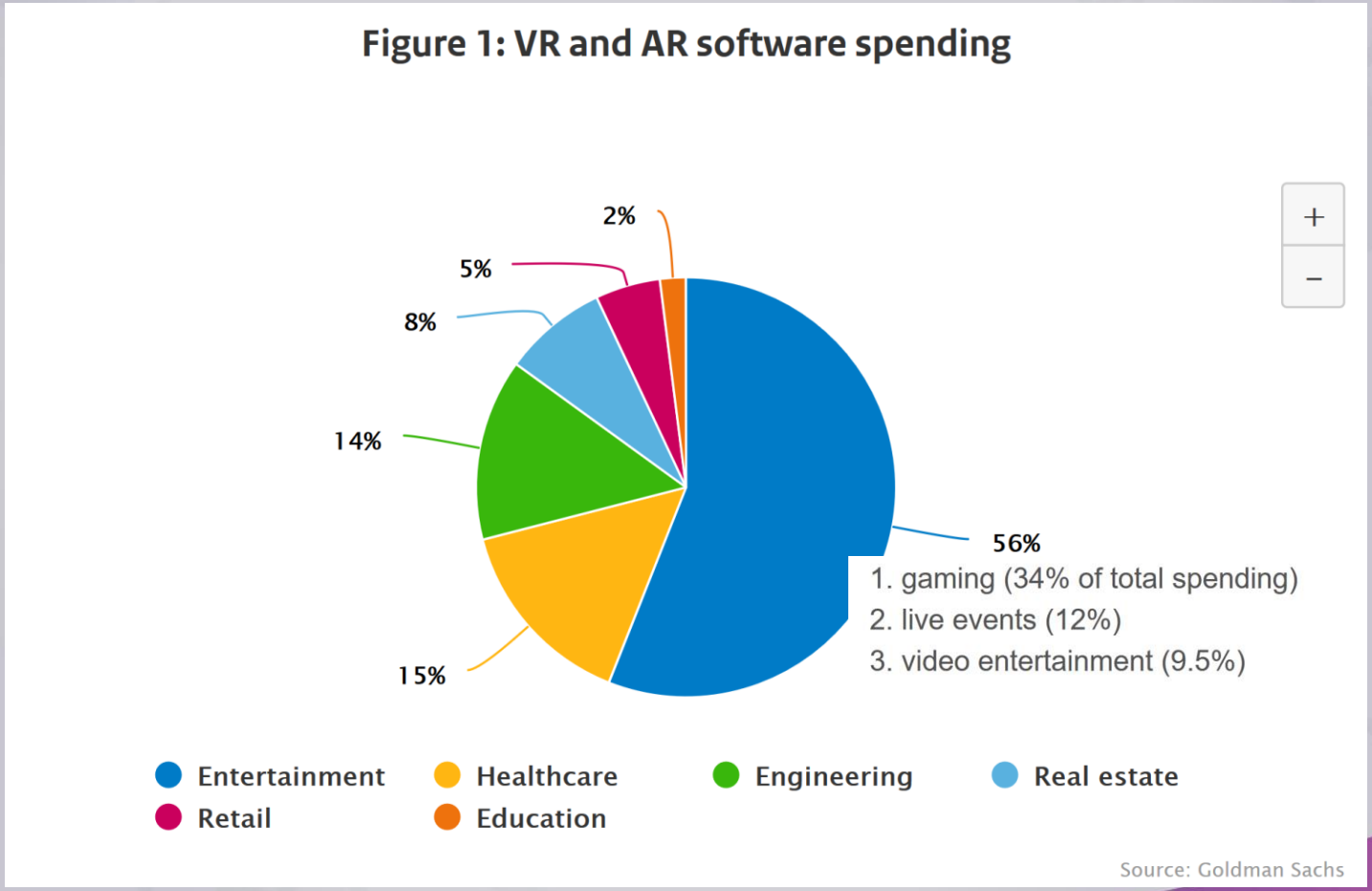
JAPAN

- Holoeyes VR/AR/XR in medical education



Source https://holoeyes.jp/en/

EUROPE



Source: https://www.cbi.eu/market-information/outsourcing-itobpo/virtual-reality-augmented-reality/, 24.01.2020

EUROPE - Trends

Technological developments

- For example through less bulky and/or expensive hardware, highly developed graphics, VR sensors in mobile devices, new soft-ware platforms and tools for faster and easier VR and AR app-lication development.
- Windows, Android, IOS, etc.

Mobile applications

- Handheld mobile devices - especially suitable for AR experiences smart-phone headsets - allow users to wear their smartphone like a Head Mounted Display, parti-cularly suitable for immersive VR experien-ces

Internet Connectivity

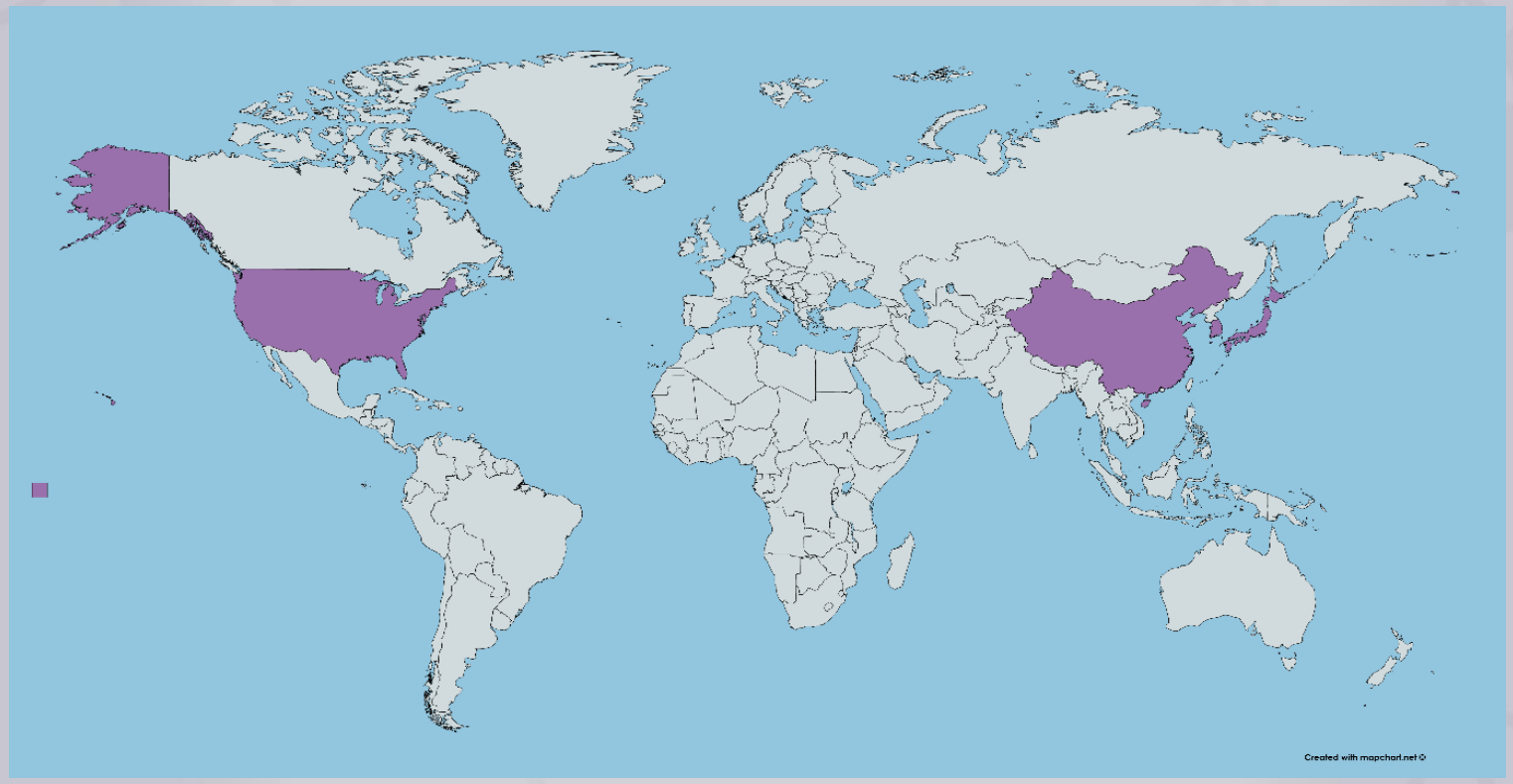
- VR and AR applications require considerable band-width. When it comes to mobile internet in Europe, 4G and **5G-coverage** has become relatively main-stream with low latency, high capacity and increased speed.

increasing need for specialised developers → lack of up to 750,000 jobs

Source: https://www.cbi.eu/market-information/outsourcing-itobpo/virtual-reality-augmented-reality/, 24.01.2020

Module C: A comparison of VR developments around the globe

EUROPE



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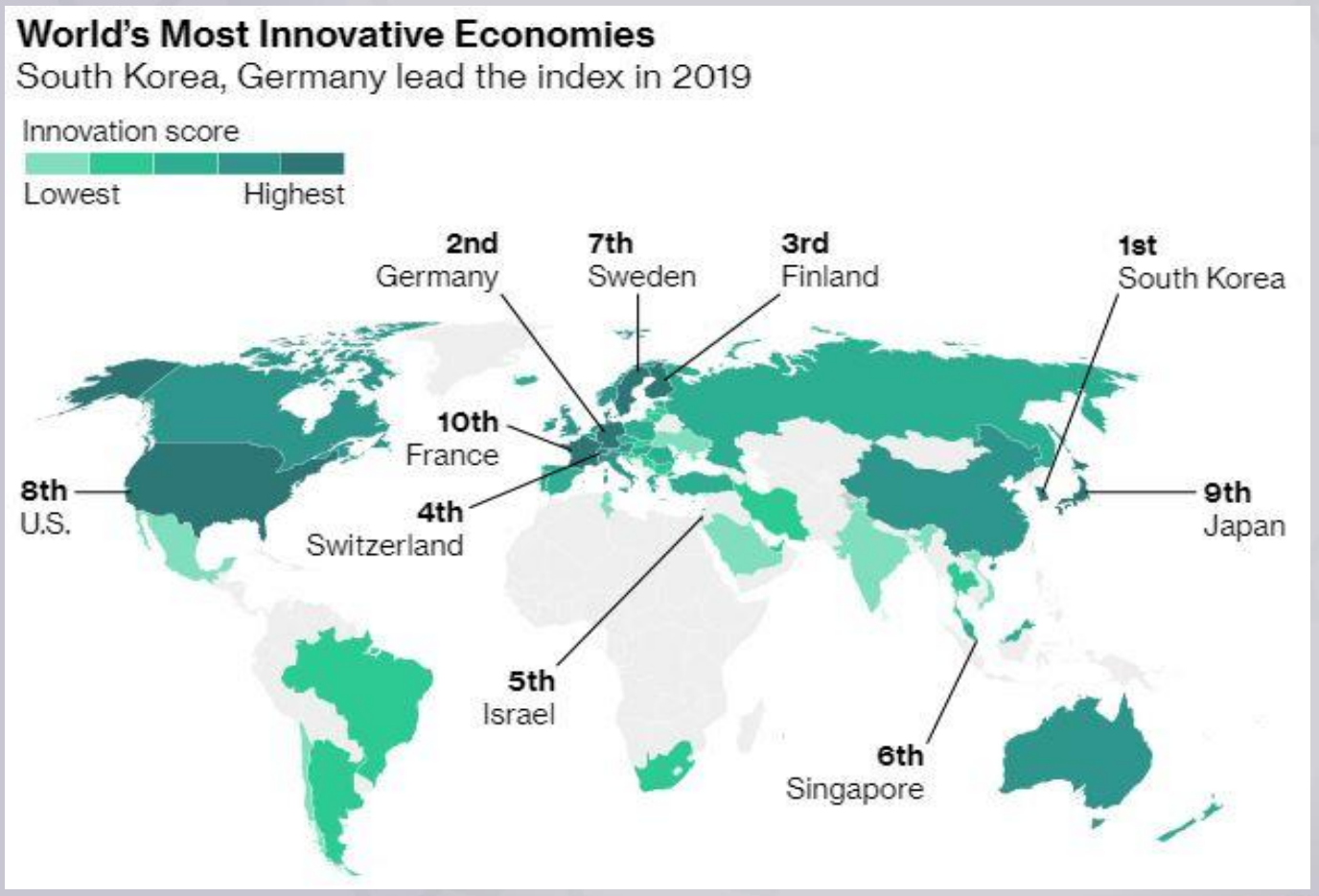
EUROPE



Source: https://www.bloomberg.com/news/articles/2019-01-22/germany-nearly-catches-korea-as-innovation-champ-u-s-rebounds

EUROPE

- 700 registered Virtual reality companies in both hardware & software in the EU

Source :https://ec.europa.eu/futurium/en/system/files/ged/vr_ecosystem_eu_report_0.pdf

EUROPE

700 registered Virtual reality companies in both hardware & software in the EU

- venture capital often tends to stream from outside the EU both
- companies and talent often soaked up by other regions (USA)

EUROPE

- VR hubs in captials of the UK, Germany and France, focused
- A Complex mix of cooperation and competition between its stakeholders
    - EUVR.org
    - Finnish Virtual Reality Association (FIVR)
    - Virtual Reality Berlin Brandenburg (VBB)
    - VAM*Rs
- *Since the early 1990s, EU research funds have supported more than 450 projects dedicated to VR and AR, with a total of over €1 billion.*

Ecroyrs Consulting Firm, 2018, Report on Virtual Reality and its potential for Europe, Ecroyrs Report

EUROPE

- ENGAGE (Oxford University and South Korea)
- Secondary school Czech republic

Source: https://www.youtube.com/watch?v=wsUfaNRBARQ

EUROPE

- VR and AR in vocational training
- large European: Rolls Royce, Heidelberg Printers and Festo.

Source https://holo.data-experts.de/news/cases/holographic-training-at-rolls-royce-germany-2/

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Conclusions

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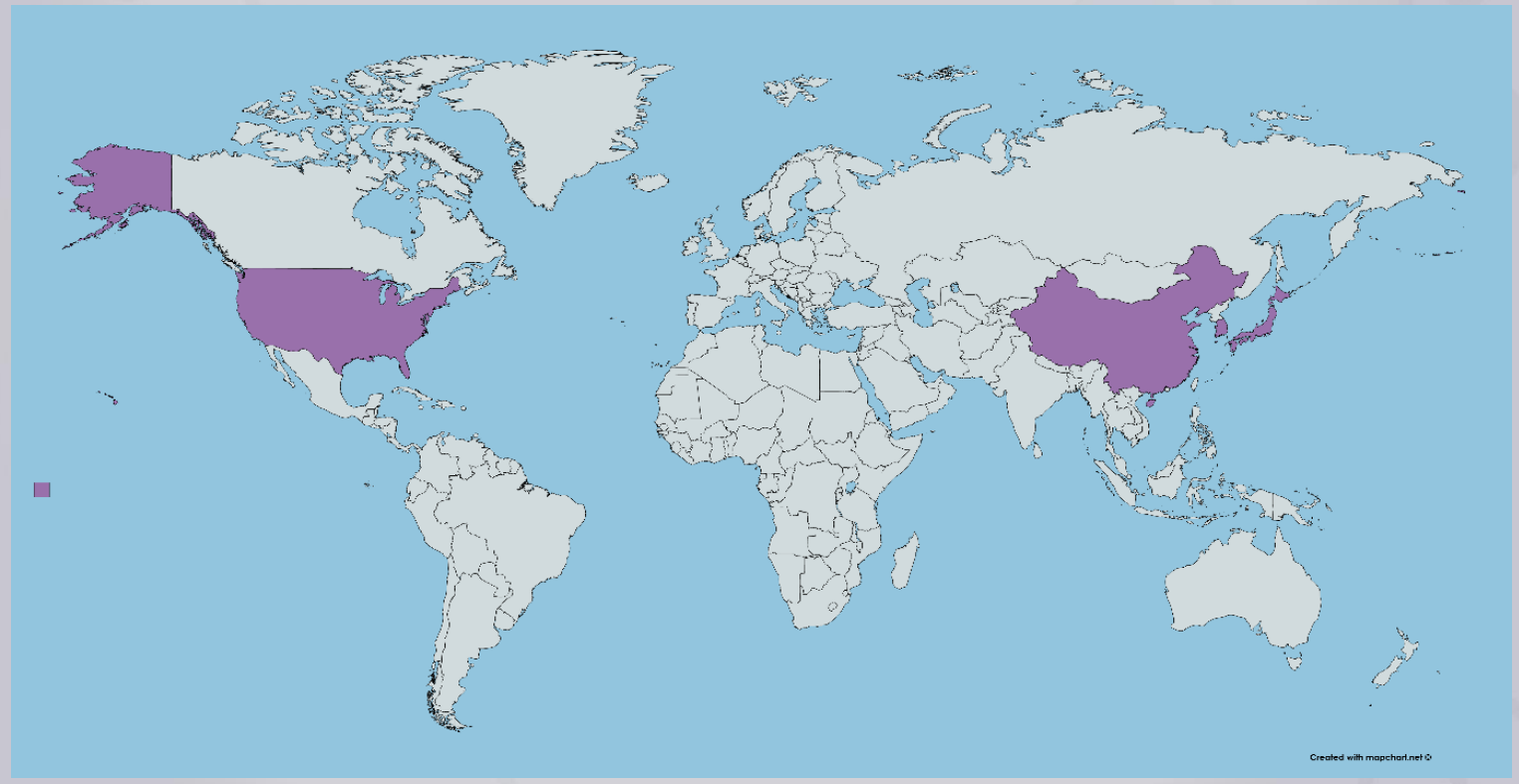

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Conclusions

VR has reached a tipping point for large scale adoption, in particular thanks to the development of more comfortable and affordable hardware. Even though VR has been around for a while, initially it was not available for the wider audience. Headsets were either too clumsy and not allowing for smooth virtual experience, or they were too expensive and powered by large-scale computers. As a result, VR was mostly used by large companies in industrial design or by specialised research centres.

Ecroyrs Consulting Firm , 2018, Report on Virtual Reality and its potential for Europe, Ecroyrs Report

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Conclusions

- The new VR hardware that will facilitate widespread adoption is predominately being developed in other regions like USA & China not from Europe.
- For widespread adoption of VR, the development of business & education friendly VR applications, software solutions and platforms that will be an essential factor
- This will continue to be a key growth area and continued focus for Europe