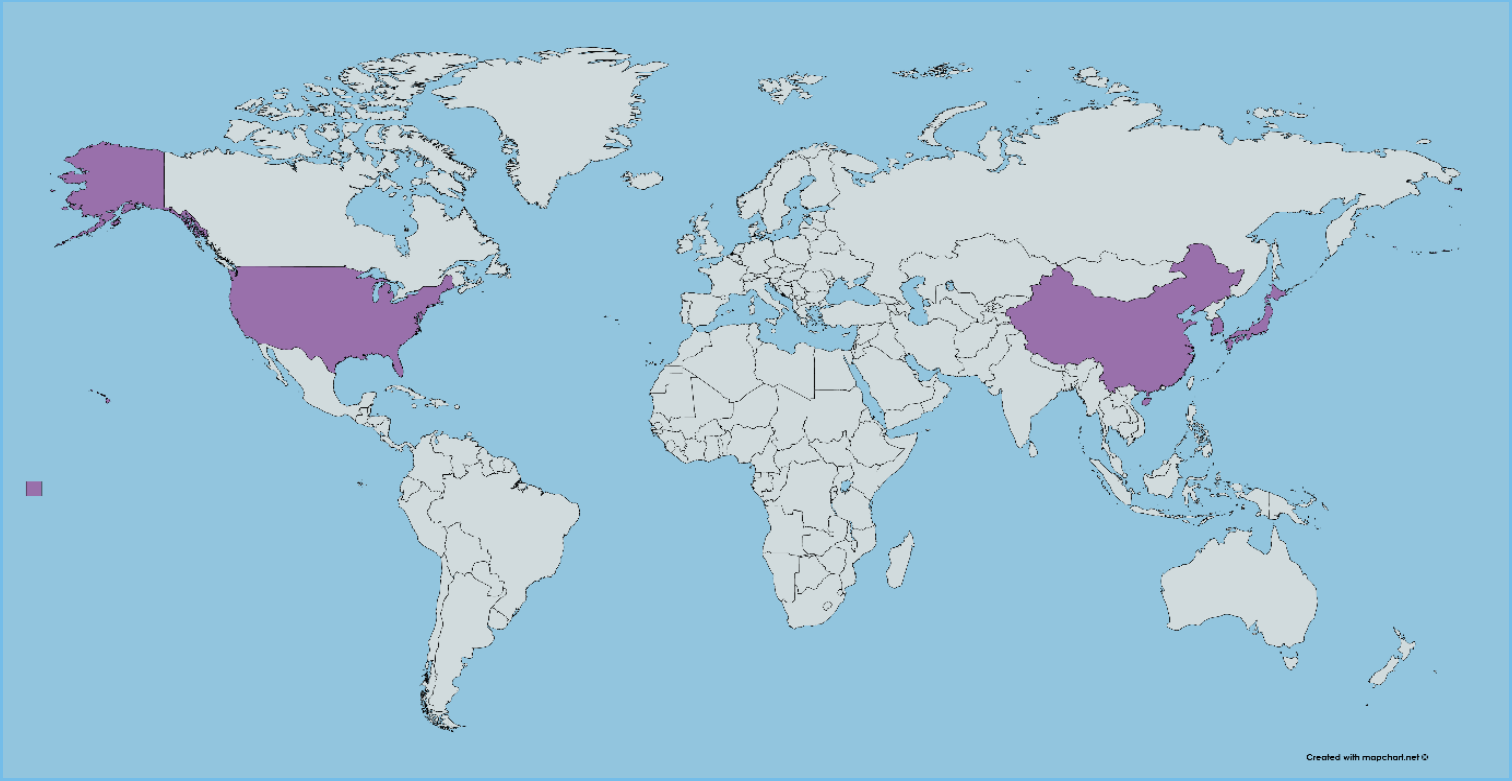
The 16th Economic International Conference
New Challenges and Opportunities for the Economy 4.0
May 7, 2020 – May 8, 2020

A comparison of virtual reality developments around the globe



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Erasmus+

This publication has been co- funded with support from the European Commission. This publication reflects the views only of the author, and the Commission cannot be held responsible for any use which may be made of the information contained therein.

A comparison of VR developments around the globe

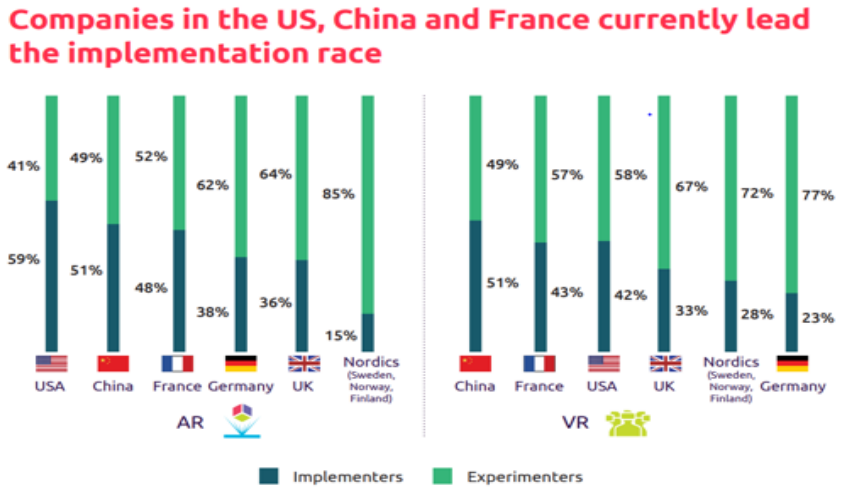
Global Status Quo:

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*

- 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*

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.
- 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

VR campuses across the country in future to:

- train and educate students in the latest VR
- offices for VR start-ups and SMES

ENGAGE VR School learning Platform

https://engagevr.io/

A comparison of VR developments around the globe

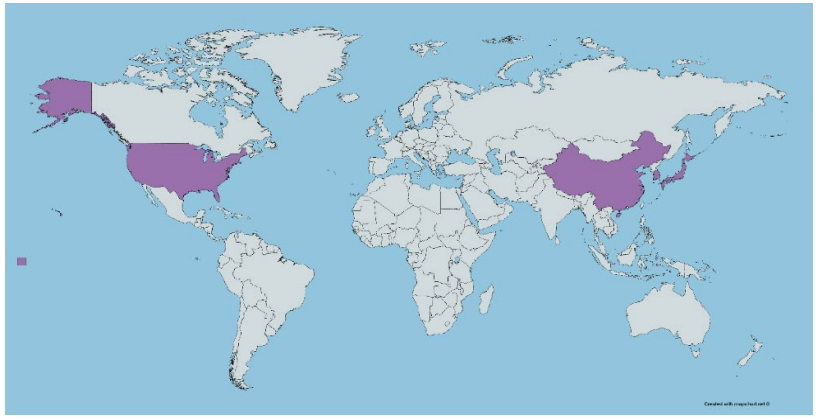
USA

- *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,



Google

oculus

Microsoft

A comparison of VR developments around the globe

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.

VR implemented into the following courses so far

- Mechanical Engineering
- Management Information Systems Analysis
- Communications – Persuasion
- Hospitality & Tourism Management

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 …"*

  Xi Jinping, General Secretary of the Communist Party of China

  B20 Summit in Hangzhou in 2016

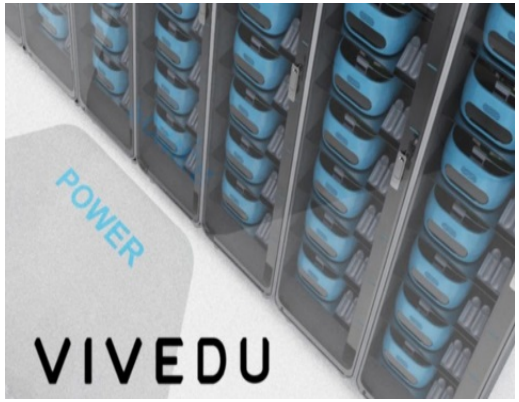
- investment in AR technology has increased to almost 4 billion dollars in 2018
- 50 % of surveyed companies (100) in China are currently integrating VR/AR technology into their business operations.

  Capgemini 2018, *Augmented and Virtual Reality in Operations*

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

htc

HUAWEI

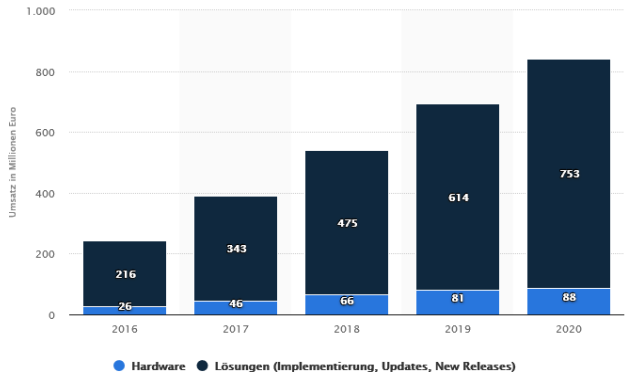


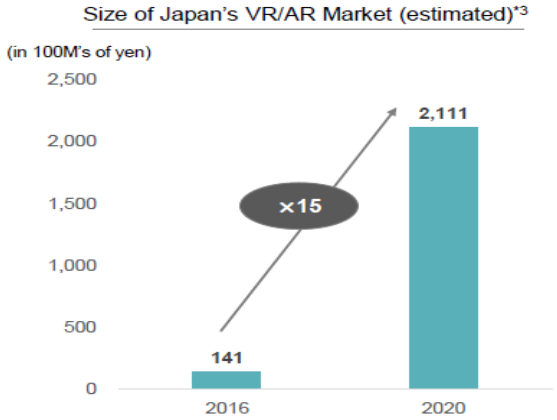
JAPAN

- 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
- Example: Holoeyes VR/AR/XR in medical education



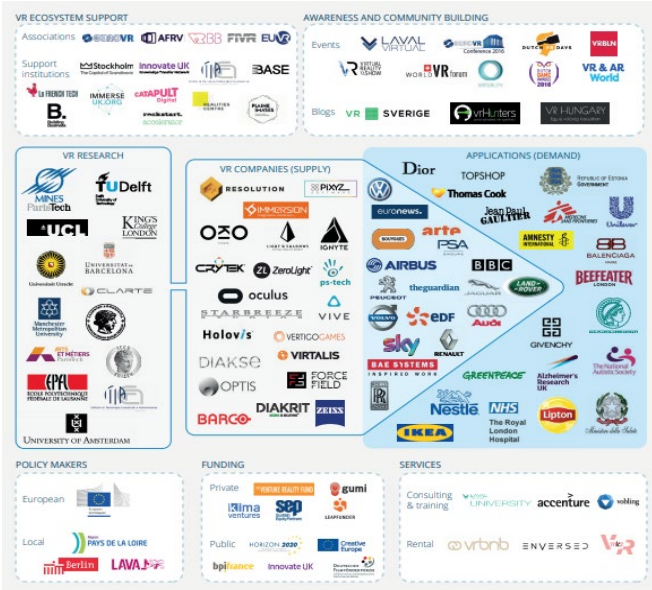


Source: https://de.statista.com/statistik/daten/studie/578467/umfrage/prognose-zum-b2b-umsatz-mit-virtual-augmented-und-mixed-reality-in-deutschland/

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)



- VR hubs in capitals of the UK, Germany and France,
- 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

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

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

- 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