

eXtended Reality (XR) - Moving from Nicety to Necessity

By Kuldeep Singh

ThoughtWorks®

Highlights

- *Introduction*
- *COVID19 Impact*
 - *On world economies*
 - *On businesses*
 - *On Human behaviors*
- *Changing priorities – Race for survivals*
- *XR Solutions taking place*
 - *Training and simulations*
 - *Productivity booster*
 - *Remote working*
 - *Healthcare and more*
- *Getting ready for XR*

TECHGIG



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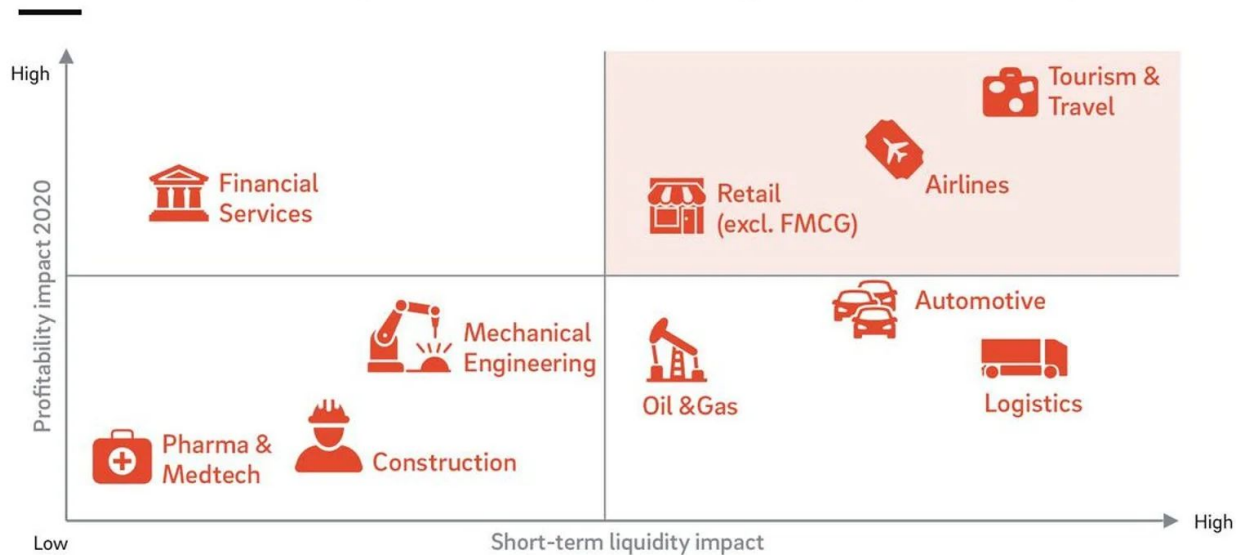


COVID-19 Crisis

Challenges or Opportunity?

Impact on Global Economy

Rate of slow down is faster, and the rate of recovery will be slower. Both liquidity and profitability is getting hit.



Source Roland Berger



A Crisis Like No Other, An Uncertain Recovery – IMF

COVID-19 is a Pandemic without a Playbook and will shrink the global GDP by 3% in 2020. - IMF

Growth in advanced economies is projected at -6% in 2020. - IMF

Impact on Businesses

Supply chain to changing customer behavior



Impact on Human Behavior

- Touchless and contactless experience
- Hygiene
- Minimal travel
- Believing in Virtual as Real
- Teleportation
- Look at the tech as saviour

Germaphobia
– Fear of Germs

Agoraphobia
– Fear of crowded places

Keeping up mental health

Anxiety/ Hypertension/
Depression

Changing Priorities

Finding Opportunity or Race of Survival?

Changing Priorities – Who will survive?

Pandemic Proof
Infrastructure



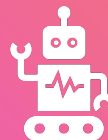
Digital
Transformation



Location Agnostic
Virtual Workplace



Automated
Intelligent Systems



Upskill
workforce



eXtended Reality (AR/VR)

*Technology is no more a department, it is getting placed at the core of business and will act as savior.
Facilitating virtual immersive experience is a need of time.*

Finding opportunities with XR

It is much more than gaming...



Porsche's **Tech Live Look**

40% reduction in repair time, and
300% increase in the Tech Live
Look program in during Covid19

[Source](#)



Normal Looking glasses

Pioneer in ARVR,
[100s of android based XR devices](#),
now [acquires North](#), normal
looking glasses.
















Source : <https://medium.com/xrpractices/the-growing-list-of-xr-devices-f102262e4a58>

Role

Percentage Growth

AR/VR Engineer		1400%
Gaming Engineer		146%
Computer Vision Engineer		146%
Search Engineer		137%
Machine Learning Engineer		89%
Security Engineer		49%
Data Engineer		45%
Frontend Engineer		17%
Backend Engineer		17%
Blockchain Engineer		9%
Full-stack Engineer		5%

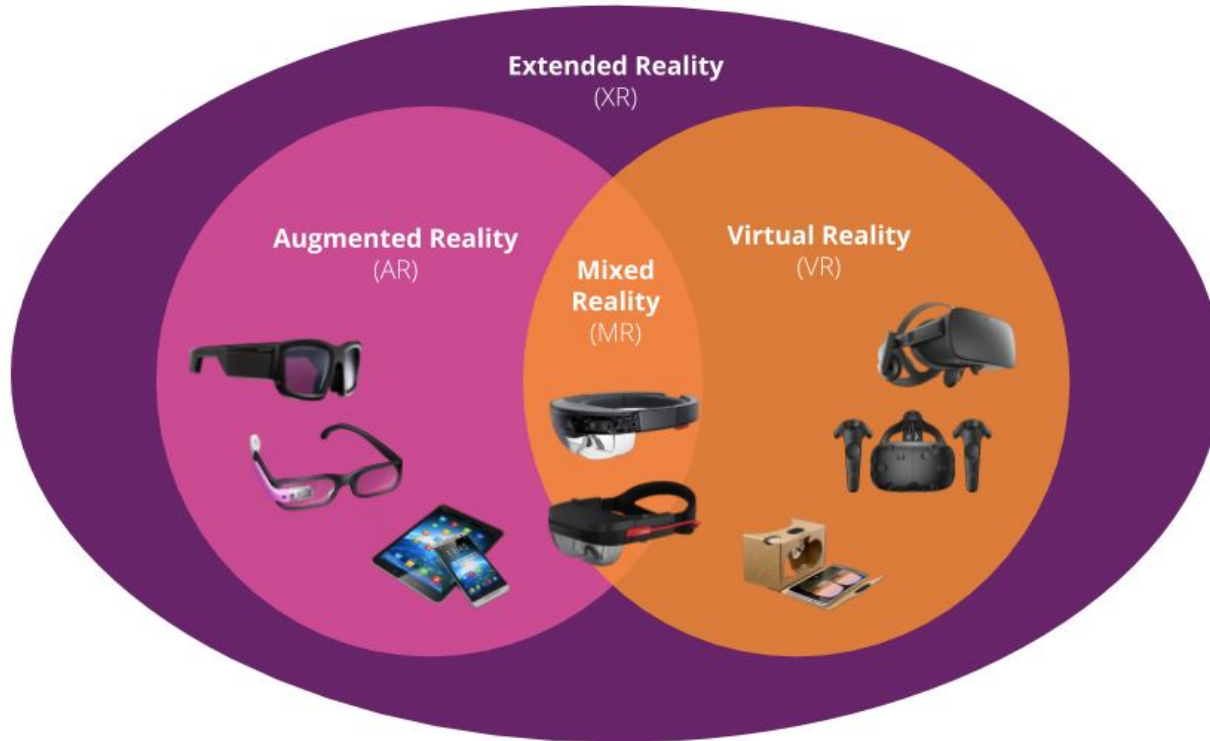
HIRED

XR Solutions taking place

Moving from nicety to necessity

eXtended Reality (XR)

Understanding multiple ways of extending the reality



AR - Augmented reality (AR)
overlays digital content in the live environment.

VR - A complete immersive experience that shuts out the physical world and takes into the virtual world.

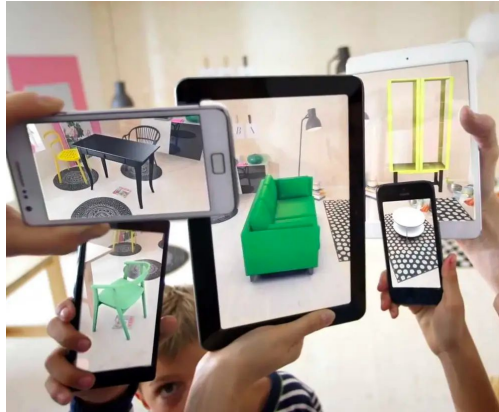
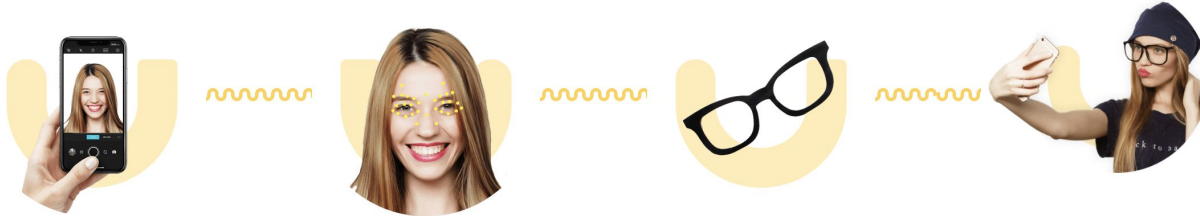
MR - Combination of both AR and VR, where physical world and digital objects interact.

Mobile XR - AR/VR enabled smart phones/tablets

Web XR - AR/VR enabled web

Virtual Commerce

eCommerce > mCommerce > vCommerce >>>> (xCommerce)



Virtual Try-On

Communal Shopping

Try before buy

Fitment

Virtual Showroom – AR
Portal Solutions

Manufacturing and Automotive

Training and Maintenance



Efficiency and Productivity

Hands Free

Service Assistant

Remote Assistant

Try before buy

Fitment and Alignment

Virtual Showroom

Product demonstration

Spatial Collaboration

Real Estate Management



Indoor Navigation

Virtual Positioning System

Warehouse management

Building guide

Augmented BIM

Service assistance

XR Walkthrough

Property/Real Estate

Training and Education



Immersive Teaching

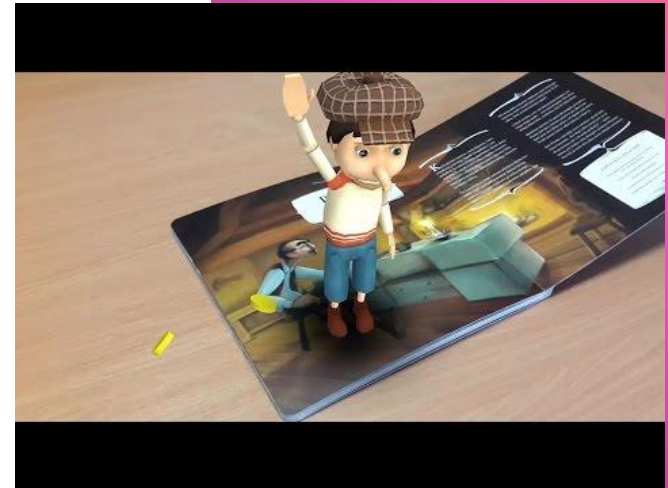
Augmented Books

VR Class rooms, Virtual Expo's

Simulation - Gravity, Experiments

Biology - Dissection

EdTech Growth



Healthcare



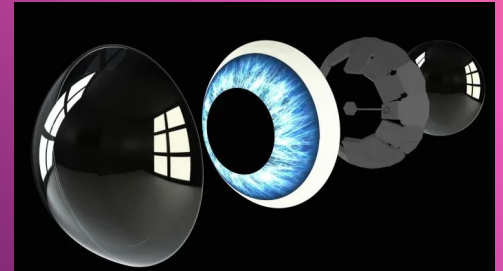
Advanced Visualization -
MRI, Scan...

Training

Smart Glasses for
specially abled

Telepresence

Mojo Vision's Augmented
Lenses



Source : <https://www.plugandplaytechcenter.com/resources/augmented-reality-healthcare>
<https://irisvision.com/electronic-glasses-for-the-blind-and-visually-impaired>

FinTech



XR payment

Augmented Information

Touchless

Virtual Bank

Onboarding and more.

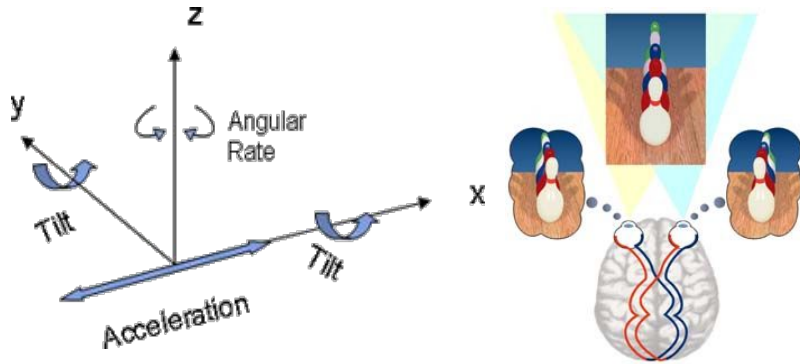
**Loan Department -
Property Guide, Product
Demo**

Getting Ready for XR

Get ready for new normal!

Understanding the Terminologies

HELLO XR!



- Degree of Freedom - 3DOF, 6DOF
- Depth Sensing - IR, Dual Camera
- IPD impact
- SLAM
- Spatial light and sound
- Occlusion
- Object Detection
- XR Content (3D models , Multimedia, 360 degree videos)

Read more : [Degree of Freedom](#),
[Understanding Human Anatomy](#)

Some more!

*Vector and Statistics,
Geometry,
Physics,
Estimations,
CV, AI, ML,
3D Modelling ,
Textures,
Animations
Video mock-ups,
Audio
Software development ...*



Engineer



Scientist



Artist



Developer



Gamer



Movie Director



Light



Camera



Action

Tools and Technology

XR enabler



vuforia



wikitude

...

- **Hardware** - Mobile device, IMU, couple of sensors and good rendering capability (FPS)
- **Software**
 - Physics engine and – Unity, Unreal, Vuforia, Wikitude
 - SDK – ARCore, ARKit, MRTK etc.
- **WebXR** - AFrame, babylone.js and three.js

Getting started

Pathway to XR Development

PART 1 – Unity Basics

- C# Fundamentals
- Getting Started Unity - <https://medium.com/xrpractices/lets-get-started-with-unity-a5b262436a8>
- Learn.Unity - <https://learn.unity.com/tutorials>
- Roll A Ball - <https://learn.unity.com/project/roll-a-ball-tutorial>
- Survival Shooter - <https://learn.unity.com/project/survival-shooter-tutorial>
- Try to build an run on your phone.

PART 2 – ARVR Basics

- Google ARCore - [YouTube – Hello AR](#)
- Getting Started with VR - <https://learn.unity.com/tutorial/getting-started-with-vr>, [YouTube – Hello VR](#)
- WebXR - <https://thinkuldeep.com/post/webxr-the-new-web/>
- 3D Modelling – Blender, 3Ds Max, Maya

Game Object

Scene

Game Physics

Navigation and
Pathfinding

Animations

Lights and
Camera

Particle System

Audio

Rendering and
Shading

Build and Deploy

Thank you!

Looking forward to see you again.



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