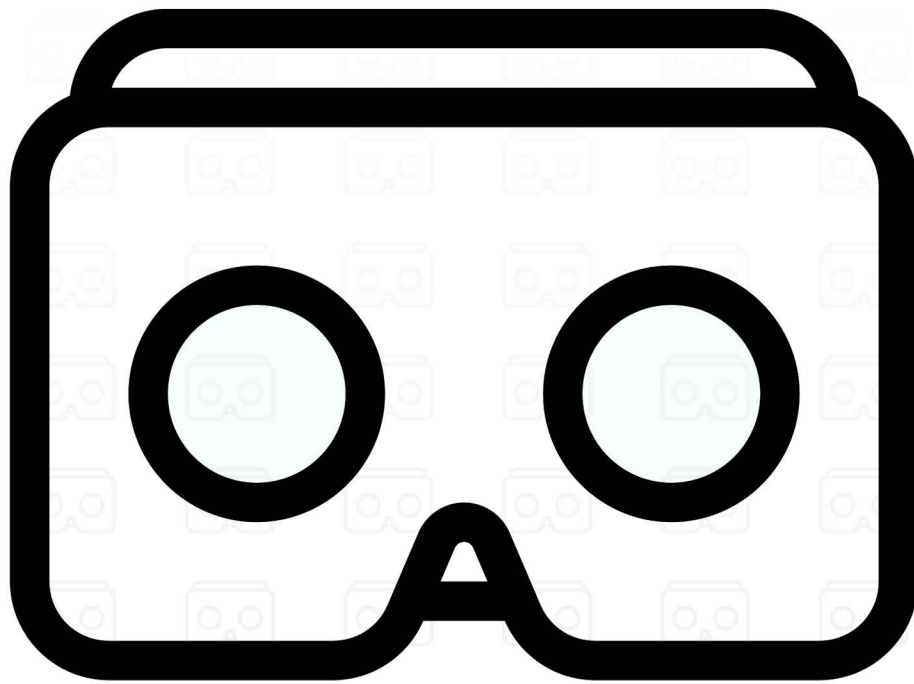


# UNDERSTAND THE CURRENT STATE OF AR DEVELOPMENT

---

---



Pt. 1

---

## SHOULD YOU INVEST IN AUGMENTED REALITY TODAY?

Here are some crucial things you will need to understand and consider before making the decision of whether or not to invest in AR right now.

# Why you should consider Augmented Reality

Deciding on whether or not you should invest in Augmented Reality today isn't easy. If you get on board too soon you risk investing in something the world isn't ready for. Getting on board too late and you'll risk losing your market or growth potential. We know, it's not easy! But, perhaps we can make it a little less difficult?

This is part 1 of 3 whitepapers, in which we will go through the crucial basics you will need to understand and consider before making the decision of whether or not to invest in AR right now.

## Understand the current state of AR development

Accessory devices for smartphones give a glimpse of the potential for a more immersive world of interaction. VR seems like the obvious enhancement for entertainment. The downside of VR is the experienced detachment of the physical world. This might be the reason AR seems to be the next big hype. It is highly related to VR but has the possibility of enhancing the real physical world instead of blocking it out.

The most technologically complex systems, with the highest potential for immersive AR experiences, are head-mounted devices with full awareness of the surroundings. It seems to be the ultimate goal in the development of a AR equipment.

Google Glass allows for an augmented reality of information where the users don't have to see the real world through a display. However, they don't truly combine the real world and the virtual world. The ideal goal for augmented reality is for the users to see the physical world directly mixed with a computer-generated world. Doing this is however quite challenging.



## Advanced technology increases easy and meaningful display of information

Processing power per unit has increased almost exponentially since the first microchips. This has reached a level where computation units have become mobile, ubiquitous and interconnected. Advancements in display technologies has made it possible to produce small displays with resolutions so high that further advancements seem redundant.

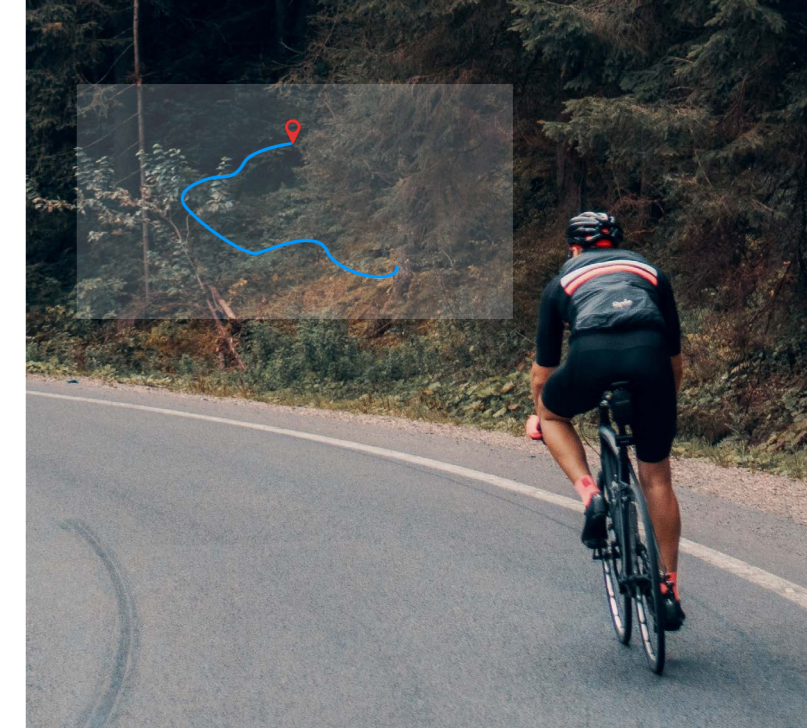
If small screens are placed right in front of the eyes and are looked at through focal lenses, images can be displayed that covers a broad field of view.

Combined with development in software tools that makes it easier to generate and publish computer generated content the technologies have reached a level where both virtual reality (VR) and augmented reality increasingly become possible. This opens new ways of displaying information in a more meaningful way and related to the context of the user.

The way in which digital objects are mediated with the physical world may be divided into two or three methods. A device can be used to make an overlay of visual information. It may be aware of the surround-

ings of the physical world and can place objects according to these surroundings or even mix the objects with the surroundings. Or a device may become aware of the surroundings using AR markers placed in the physical world as a reference to the device observed through a camera.

AR content can then be placed or projected according to this reference. And finally, a device may have a minimum of awareness of the surroundings. Relevant information may be placed according to GPS, compass, gyro and accelerometer sensors and through these it may enhance the user's view of the real world.



## Increased usefulness and experience of increased value to users

The technology that allow AR devices to be aware of their surroundings can best be described by looking at how a company such as Apple have taken the first steps towards implementing AR into the next generation smart phones.

Its computer vision and perception of depth makes it possible to measure distances in the physical world with an artificial ruler. In another app demonstration, computer-generated objects can be placed in the "physical world" with respect to aspect ratio and an awareness of e.g. flat surfaces.

Since 1st generation AR devices lack the capability to recognise distances or surfaces they rely on other

ways to insert objects and mix it with the real world. Here QR codes or AR Markers comes in handy because the smartphone can read the code and insert 3D data that is paired with the code.

Furthermore, the smartphone can mix the 3D objects so it corresponds to the relative size and perspective of the QR code/AR Markers. This use of QR code/AR Markers makes most smartphones capable of showing AR content.

Even though the AR experience hasn't reached its ideal goal yet, the technological development is moving rapidly towards greater usefulness and experiences of increased value for the user. How to apply this technology to your industry in a meaningful way, however, is an entirely different matter.

