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# Visualizing the Future of Head Worn Hardware

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*Imagine a world where any information or image you need is accessible right in front of you when you want it. Where your digital world fuses with your reality as seamlessly as the physical objects around you do today.*

XR<sup>1</sup> glasses are the inevitable evolution of mobile computing. They are the ultimate mobile device and a paradigm shift that will meld your digital content with the real world. The XR industry has come a long way, but this much awaited wearable computing platform has yet to hit the consumer market in any real way – plagued by the lack of meaningful experiences and hardware insufficiencies. I've written about this evolution before, but today I want to tackle the question: How do we accelerate the arrival of a device that will fundamentally change the way we interact with our data and our world?

## Walled Garden or Industry Ecosystem Approach to Innovation

Conventional wisdom assumes there are two ways the next generation of computing can be achieved:

1. An industry titan invests billions into an army of engineers that builds the 'perfect product'; or
2. Disruptive laser focused companies, with their subject matter expertise, collaborate together to shock the world in a coalition of innovation and audacity.

Historically speaking, true change rarely comes from the chambers of industry titans. For example, the leaders in mainframes weren't able to hold that lead when it came to the PC, neither were PC leaders able to make the jump to mobile, nor mobile companies to social or e-commerce platforms.

Large companies excel in efficiency of design, in the ability to take something that has been proven to work and expand its capability or iterate on its functionality. Industry titans are, by definition, masters of scale.

<sup>1</sup> Extended Reality (XR) is used as a term that encompasses Augmented Reality (AR), Mixed Reality (MR), and Virtual Reality (VR)

Being vertically integrated has many strengths, but it often removes the voice of the niche experts and restricts democratization of ideas across the spectrum to solely focus on efficiency and cost. It also limits significant progress to only those larger projects that are core to the larger company's business. It is clear in the XR world, having massive amounts of money and people do not guarantee the right solution, no matter how much of a leap you take in magical solutions.

Time after time, history has taught us that real change comes from the dedicated, driven, focused few who believe in their vision and pursue it relentlessly, not stopping until they achieve that goal.

In healthy business environments the best idea should always win, regardless of where or whom it comes from. To enable this, you need a unified platform where innovators and developers from anywhere can express and test their ideas – contributing their voice to one centralized vision.

### Functionality Versus Fashion Debate

Let's now dive into the two mindsets that have come to dominate XR product development thus far:

1. Those who believe the device needs to be familiar and diminutive, vanishing from the user at all cost even if it sacrifices core functionality; or
2. Those who believe the device needs to do something meaningful and not just be a simple status display on your face, even if it leads to a socially unacceptable design.

**We at DigiLens believe in a third solution** - a device that strives to be diminutive but that also enables true emergence. We know the consumer will not compromise – consumers want the image quality they see every day on their big screen TVs, they want the compute they use every day on their laptops, and they absolutely expect the mobility and versatility of their smartphones.

For a new product category to become the de-facto next generation mobile computing device, it must thoughtfully complement the experiences that have come before, ideally exceeding upon them in every way possible.

We also recognize that if a device is on your face, it is fashion. The device needs to be more than just socially acceptable, and it must reflect the unique individual wearing it. The face is the first representation of who you are, your fashion and style, so anything that resides on your face will have the highest demand for individuality and customization.

### Solving The Head Worn Paradoxical Dilemma of Form Over Function

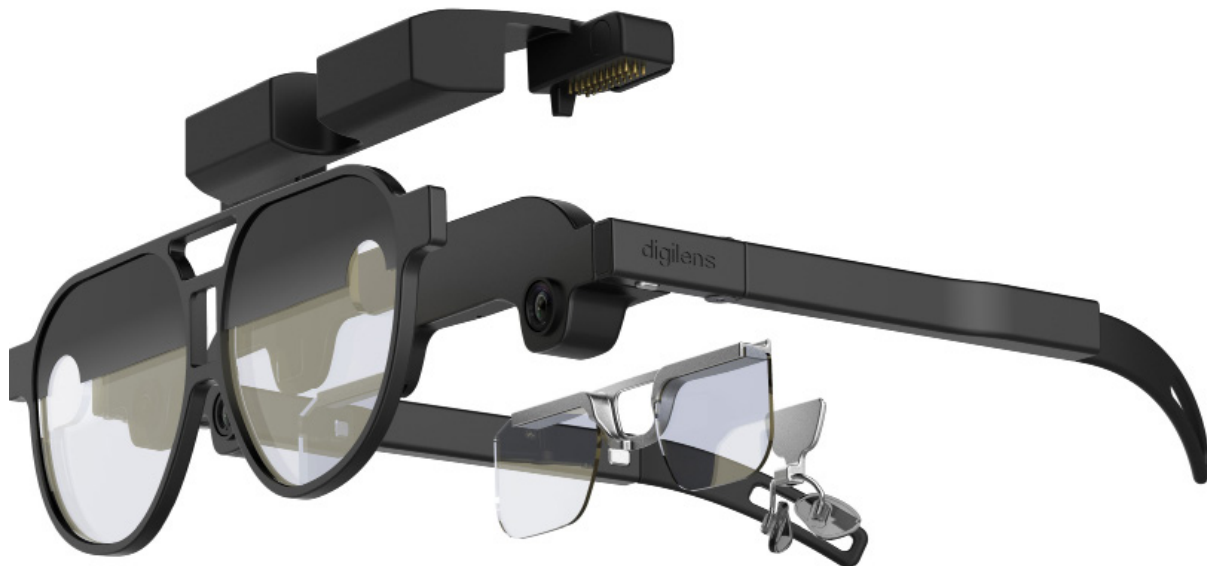
Functionality and social acceptance are at the core of all XR product battles today. That's why DigiLens has created the Visualize Hardware Development Framework (HDF) – a springboard process that threads this needle between functionality and fashion. We understand that both camps need equal opportunity to iterate and perfect their design.

The Visualize framework presents an integrated modular solution that separates the compute, projection and display, while enabling each to be independently refined in parallel. It aims to be a platform to push innovation into the value chain, and the goal is to allow both functionality and fashion to equally coexist and collaborate in achieving a customized hardware solution for any desired market.

The goal of the Visualize HDF is to be a XR glass blank canvas designed to reduce the friction of innovation. The initial device coming out of the framework is what we call Design v1. It removes a major barrier to entry and allows innovators to focus on what they are good at, in turn pushing the whole head worn ecosystem forward. The framework offers the XR industry its first solution to smartglasses that boasts a small size at a reasonable cost with unrivaled image quality and transmissivity. It enables iteration in technology, fashion and capability so subject matter experts can focus on whichever they choose.

### The Modularity Approach for Customization

Design v1 also realizes that full XR is not always needed - sometimes just listening to your music or capturing a moment in time is all that is desired. This initial Design v1 understands that different aspects of our day require different solutions, so it empowers the user with the same modularity it gives the innovator. It allows users to choose when they want to be immersed or present, when to casually listen or dive deep into the imaginations of XR artists. Likewise, the hardware provides flexibility by separating the three main functionalities of the smartglasses into independent modules:



1. The XR2 Processing Module – This part of the design contains all the essential functional processing electronics powered by Qualcomm’s Snapdragon XR2 Platform. This is where the processor, radios, memory, tracking cameras, speakers, and central camera are contained.

2. The Waveguide/Front Module – Because of DigiLens' advanced optical process, our thin waveguides are actually the front shields of the glasses. With our cost effective Bragg grating technology, multiple waveguide front shield shapes can be designed, radically changing the overall style of the smartglasses for the user.

3. The Projector Module – On top of the design flexibility, we have exposed the MIPI-DSI signals and power coming from the processor module. Partners can easily add or remove the projector module with the push of two buttons. We will provide a variety of different projector module resolution and technologies to enable different experiences. Depending on the final use case of the product, technologies can be swappable or exchangeable. With the projectors removed the glasses will still fully function as smartglasses, which allow voice capture, spatial audio play back, video capture, SLAM mapping or even a virtual assistant capability.

Along with the benefits of modularity, we strongly believe in empowering the widest possible ecosystem of developers, processor manufacturers, engineers, product experts and designers to come together to enable a truly unmatched experience from start to finish. Our partner Qualcomm has the best mobile computing chipset in existence, and our other experienced partners have designed over 16 different XR platforms ranging from industrial to consumer.

### Expanding the Pool of XR Experts

The trick is not to build another product, or worse, reference design that becomes obsolete the moment it's copied. The goal is to build an **organic living platform of (and for) subject matter experts**. A community of the focused and determined, evolving a platform through rapid iteration and innovation. This way, the whole XR world is empowered and pushed to build what they envision, and what society expects.

**Great product development happens from constant learning and nimble iteration.** At the beginning of any new category creation, what is needed are good ideas and rapid adaptability. Fail fast, learn faster and quickly adapt.

When defining a new category, the modularity of the solution to adapt to every changing breakthrough of technology or human response is paramount to the success of the design. A process done right will potentially spawn a multitude of new and disruptive products across the spectrum of mobile computing.

The Visualize framework even aids the internal development cycles of the industrial titans, who cannot make a mistake when launching 'perfect' products. It gives them a flexible platform to learn from and exposes them to additional external subject matter experts that they may have not found on their own – more on this topic to come in later posts.

## Reigniting the Powder Keg of Visionaries

It's been almost two decades since I started my journey in XR. During that time, I've seen a powder keg of subject matter experts form who can see the future but have grown frustrated with the slow crawl of its arrival. People with ideas years ahead of the industry, seeking solutions for problems the world has yet to understand, but limited on what platform to express it on. With the Visualize framework, scaffolding has been put in place to enable XR visionaries, as well as industry titans, to bring next-generation XR hardware and its ecosystem of complementary technologies to the market **at a far faster speed than ever before.**

We hope Visualize will be that spark in the powder keg - that crystalizing force that enables these mavericks to have a voice and show the world how they envision the future that others are yet to see.

## Where to Begin

Later this year, DigiLens will announce further details about the Visualize HDF. Yes, this is ambitious, but without ambition and vision there is no growth and creation. Help us push the boundaries of what is possible, let's innovate together.

To learn more about Visualize and share your XR use case with us, or to apply to be one of our collaboration partners, please visit [DigiLens.com](https://DigiLens.com).

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