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AR YOU READY?

A LOOK INTO THE FUTURE OF AUGMENTED AND EXTENDED REALITY IN THE FINANCE AND INSURANCE INDUSTRIES

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THE NEXT DIGITAL REVOLUTION

We are on the doorstep of the next digital revolution. In a not-so-distant future, interactions with our digital landscape will be drastically changing when the next generation of XR (extended reality) products hits the retail market. Is the financial industry ready for these changes?

XR covers a range of technologies that have been available for the better part of the past decade: virtual reality (VR), augmented reality (AR), and mixed reality (MR).

The future of the finance and insurance sectors will be greatly affected by the potential of XR. In the following whitepaper, we explore what an XR enabled world might look like, the market landscape and current state of XR based technologies, their probable effects and why the finance and insurance sectors should prepare for their adoption.

Before we review the current state of the XR landscape, let us take a look at everyday life in this near future.

XR TOMORROW

Meet John and Mary Tomorrow. John, a young entrepreneur, and Mary, an insurance broker, live in a not-so-distant reality where XR is a part of day-to-day life.

This morning, John finished a conversation through his Hololens 3 headset with a seller looking to part with an old Ford Mustang. John believes he can fix up the old car and flip it for a profit. There's a small hiccup though: the seller is old-school and will only agree to a cheque deposit to close the sale. Hololens 3's integrated assistant, Luni, has already determined John will need cheques and ordered them from John's bank. Luni also asks John if he would like instructions on how to use cheques. As John has a few minutes, he acknowledges. Luni immediately retrieves the cheque tutorial from John's bank, overlays it with John's current surroundings and displays an open chequebook on a nearby counter. The tutorial then runs John through the key elements needed to fill out a cheque. John is curious about the set of characters at the bottom of the cheque and indicates this to the training program. The requested information appears and, highlighting each set of numbers, indicates these represent his bank, branch, and account number.

Meanwhile, Mary is in her insurance company's quarterly broker meeting. All the Canadian brokers have joined with their avatars in a virtual meeting. Mary enjoys these meetings as they allow her to connect with her peers at least every quarter. While in the meeting, she spots Jane, with whom she meant to catch-up. As the meeting is not mandatory, she sends Jane a request for a private chat. Once Jane accepts, both Mary and Jane find themselves on a Hawaiian beach, Mary's preferred virtual environment for "water cooler" chats. Now that they are somewhere private, they get down to business regarding a corporate prospect they have both been interested in bringing in as a client.

In the meantime, John has connected with his financial planner to determine how to best invest his recent earnings. With the wave of a hand, the advisor brings up John's current accounts. John can easily review them side-by-side and they overlay the peaceful lake vista John prefers for conducting this type of business. In a few gestures, the advisor can show John a few interesting investment scenarios and provide a comparison of each, with pros and cons analysis all showing in John's 360-degree view of his financial assets and liabilities. Having reviewed the options and tweaked the plan to his liking, John has authorized the execution of the new plan by having his Hololens 3 scan his retina.

By now, Mary has boarded an autonomous Uber to visit one of her clients who needs her advice with a claim they intend to submit. While the Uber drives her to her destination, Mary uses the gesture recognition capabilities of her MagicLeap 2.5 headset to pull up the latest claim reports she must review and approve. Mary's client is anxiously awaiting her as they were in a recent car crash that they didn't immediately report to the insurance company. Mary reassures the client that, as a premium plus member, these issues are waived. Looking at the damage to her client's vehicle, her MagicLeap communicates directly with the insurance company's damage evaluation system. After a short moment, Mary can provide her client with reassurances that, given their policy, they'll only need to pay the deductible of $500 and the other damages, estimated by the software at around $5,000, will be taken care of. Mary is also given the details of several garages in her client's neighborhood who could perform the needed repairs.

As Mary finishes with her client, John enters a boutique he found on his walk home. The boutique sports an interesting handbag which John thinks Mary might like. As John looks at the handbag, his Hololens scans the bag and connects with his bank's fraud detection software to determine its provenance. The software alerts John that the bag is likely a knock-off given some of the defects detected by the Hololens' built-in cameras and millimetric lidar sensor. John decides to buy Mary some flowers instead.

These are just some of the user experiences that await us in just a few years' time, as XR technology becomes more pervasive in society. Today the Hololens 2, Magic Leap 1 and Google Glass 2 are already used in multiple industrial environments, from Intel to BMW and others. We won't have to wait long before seeing these technologies emerge in the retail market. Will our industry be ready? Will you be ready?

MARKET LANDSCAPE FOR XR

Based on a survey conducted in 2019, the majority of (77%) extended reality professionals[1] believe that mainstream adoption of the technology will occur within the next 2 years (by 2023).

Adoption for the technology is typically classified into two segments: consumer and enterprise. Consumer adoption today is still limited and probably best represented by the sale of more than 5 million PlayStation VR units[2] (since 2016). However, enterprise adoption is much more representative, such as Intel's adoption of the HoloLens 2 to improve productivity in its Irish semiconductor fabrication facility,[3] and others we will cover in the rest of this whitepaper.

The current adoption of XR is most prominent in healthcare, education, and location-based VR experiences, such as museums and art installations. To date, enterprise adoption of the technology has the following characteristics:

1. Specific business intention and usage

2. Hardware is available within a specific facility (not on the go)

3. Users typically don't bare the cost of access, organizations do

Like any new technology making its entrance to the mainstream market, there are obstacles to overcome. XR is faced with challenges like those faced by smartphones in their early days. On the consumer side, the challenges include hardware constraints (limited accessibility and battery life for constantly-on, on-the-go productivity) and limited software support in the marketplace. XR is also a developing domain that demands new skill sets, design standards, and tooling to further refine its capabilities. Fortunately, like with any technology, adoption will perpetuate itself, snowballing the integration of XR products into everyday life.

However, interest in XR remains high, with technology leaders, such as Microsoft and Google, as well as specialized start-ups, such as Magic Leap, competing and rolling out new products in this domain. Qualcomm, the world's largest producer of mobile chips, is also betting big on these technologies, with their investment in the XR2 chipset that combines 5G, AI and VR capabilities,[4] as well as the acquisition of Wikitude, an AR development platform. Apple has also steadily phased in AR and VR capabilities with its devices, along with the release of ARKit and RealityKit, AR software development frameworks for the iPhone. If rumors are to be believed, Apple is expected to launch an AR headset in Q2 of 2022.

According to report published by Research And Markets,[5] projection of XR adoption for the next five years is optimistic as the market is projected to grow from $42.55 billion in 2020 to $333.16 billion by 2025, at a CAGR of 50.9%. A projected market potential of $1.5 trillion by 2030 according to PwC's 2019 "Seeing is Believing" report.[6]

TODAY

First, the most recent announcement from Facebook regarding the name change of its parent company to Meta and future focus on all things Virtual Reality should be an indicator of things to come. But Facebook are far from alone to focus on XR related technologies.

According to recent Microsoft reports, MR is already being successfully deployed for the following industrial use cases: Contextual Overlay,[7] Design and Prototyping,[8] and Remote Assistance.[9] And as per their recent announcements at the Microsoft Ignite conference, they are also invested in bringing virtual reality to everyone.

When you hear contextual overlay, think a heads-up display that provides the user with real-time input and feedback about the activities they conduct. For those who operate in the field, having real-time, intuitive access to relevant data is a game-changer as demonstrated, for instance, by Lockheed Martin (manufacturer of the F-22 Raptor fighter jet).[10]

NASA contracted Lockheed Martin to build the Orion spacecraft. To help their team work more efficiently, Lockheed Martin used MR to enable remote collaboration and step-by-step holographic training overlays. While most companies experience a 30% reduction in human error after transitioning to MR, Lockheed Martin has not had a single instance of human error since first implementing the HoloLens in 2017. Just to emphasize how incredible this is, Lockheed Martin is building one of the most advanced machines in human history and has had ZERO cases of human error. The effect to project cost has been astounding – the Orion spacecraft will have over 57,000 fasteners and Microsoft's HoloLens 2 allows Lockheed Martin to save $38 per fastener. MR has successfully allowed touch labor to be reduced by an entire magnitude, what once took an entire eight-hour shift can now be done in just 45 minutes!

In the area of design and prototyping, the technology allows users to easily visualize, iterate, and collaborate on proposed designs. Airbus, a leading aircraft manufacturer, is leveraging AR to design and prototype their next generation of aircraft.[11] Thanks to the power of AR, they have seen their process accelerated by 80%, and that's just for the design process: 30% improvements of complex tasks in the assembly process are likewise expected.

With the ability to create a remote presence anywhere, the platform will enable a host of companies to further their ability to provide remote assistance and remote sales capabilities.

Italian luxury goods brand Salvatore Ferragamo is working on a new sales platform for their Tramezza men's footwear collection.[12] This platform would allow customers to interact with a 3D reproduction of their shoe, allowing them to consider different combinations of materials, features, and other details much more intuitively. Human sales associates will also be able to provide remote assistance through the platform, allowing Salvatore Ferragamo to bring the in-store experience into customers' homes. The platform is expected to bring a whole host of benefits, such as optimizing the customer journey, simplifying purchase methods, and improving space management of physical stores.

In Korea, creative technology company Giantstep has been making headlines in the media and entertainment business with their work on virtual influencer Vincent, or by producing the virtual avatars for the girl band AESPA. Asian countries, such as Korea, are avid consumers of virtual content and companies, such as Giantstep, have been reaping the benefits, the company was introduced on the Kosdaq on March 24 of this year and has a current market cap exceeding $500MM.

Whether it is training, design, sales, remote assistance, or entertainment, these are only a few ways industries are starting to scratch the surface of the possibilities offered by XR platforms. We provide further examples of new and existing companies who are betting big in these technologies in Table 1 (note that this table only lists a few additional examples, as an exhaustive listing would turn this whitepaper into a book).

Table 1: Sample of Companies active in XR

COMPANY	INDUSTRY	WHAT THEY DO IN XR
Bosch	Automotive	Bosch AR platform for technical training.
Sony	Entertainment	Sony Playstation's VR headset is probably one of the biggest success stories in retail VR with over 5 million units of the first-generation headset sold and a new headset in the works for its Playstation 5 lineup.
Microsoft	Software and Hardware	Microsoft has introduced Microsoft Mesh that will enable collaboration in XR anywhere using their Hololens hardware.
Spatial	Software Solutions	Spatial offers a platform that can create "virtual space" everywhere.
Snap	Social Media Services	Snap (the company behind Snapchat) launched asset of AR glasses geared toward the development community in May of this year.
Facebook	Social Media Services	Facebook bought Oculus, a VR company, in 2014 and has since launched Horizon a VR social playground. They recently unveiled smart glasses built in collaboration with Ray-Ban which they consider a steppingstone toward AR.
Ikea	Furniture	Ikea has built augmented reality capabilities in their shopping app since 2017 and launched IKEA Studio earlier this year.
BMW	Automotive	BMW has been using AR in its pilot plant for vehicle prototyping.
NReal	XR Glasses Startup	NReal is an AR glasses start-up that is one of the first companies to produce a product using the capabilities of the Qualcomm's XR chipset.
Lululemon	Sports Apparel	Lululemon is launching the MIRROR, an MR mirror/ display technology for indoor training with real-time feedback.

WHAT DOES THIS MEAN FOR THE FINANCIAL AND INSURANCE SECTORS?

To date, the smartphone is arguably the technology that had the greatest effect in creating a symbiotic experience between people and the digital world, seamlessly connecting people ad systems anytime, anywhere. By blurring the boundaries between the real world and the digital, XR is taking this one step further and fully immersing humans into the digital experience with a more profound impact.

The possibilities to create new interactions for customers, employees, and the community are numerous, including training, remote interaction, self-assistance, marketing, fraud prevention, digital workplace extension, and more (see Table 2).

Table 2: Additional VR and AR usage scenarios

SCENARIO	DESCRIPTION
Workplace Improvement	From empowering people to determining where work is done, to how work is done, the ability to improve the work environment using XR, along with the already stated productivity improvements, are driving adoption of these technologies in the workplace.
Remote Interaction	Because of the COVID pandemic, remote working has become commonplace. Though it helped us deal with an unprecedented event in our society, virtual interaction via Teams, Zoom, and other remote meeting technologies leave much to be desired in their ability to support true interaction, brainstorming, and collaboration. With XR technologies, real telepresence can become a reality.
Banking	Using these technologies, it is easy to imagine the bank branch of tomorrow, either a fully virtual branch or a branch without desktops, in which each teller uses an augmented reality setup to interact directly with the client without the need of a desk or computer station.
Property acquisition	Some banks have already started offering customers assistance through VR for the purchase or sales process of a home. Others have started rolling out capabilities to help customers with home inspections.
Training	Safety training or assistance to help employees, such as adjusters or tellers, to recognize dangerous situations and react appropriately, either as a training exercise or even in real-time.
Fraud Prevention	By combining the additional visual and location data provided through the technologies embedded in AR hardware, together with data mining and machine learning, additional fraud prevention capabilities will be in everyone's reach, potentially even including always on lie detection.
Marketing	AR is an emerging trend in experiential marketing. It allows brands to craft new ways to engage with the customer through methods, such as try before you buy, new ways of branding, the creation of interactive sales materials, and more.

To participate in this evolution, it will be key to build the skills and tools needed to harness the capabilities of this coming digital era. Gone is the web browser, HTML, and CSS, gone are the 2D graphic artists and their content creation tools, and gone is the ubiquitous mouse or trackpad. Tomorrow's skills and tools enable navigation in a three-dimensional world not limited by two-dimensional windows. To quote Spatial, "your room is your monitor, your hands are the mouse."

This brand-new set of skills and tools will include:

- JavaScript, Angular, and React development skills will be replaced by skills more akin to game development as the browser is being replaced by real-time 3D engines, such as Unity or Unreal.

- Experience designers will have to build journeys in a three-dimensional world with a much wider range of interactions, integrating the experience with the user's evolving physical spatial context. To take this even further, designers can even create the context of interactions through the definition of specific Metaverses.[13]

- Content creators will be building 3D content with a different set of tools, switching from 2D tools, like Illustrator, to 3D ones, like Medium, Blender, and Substance Painter.

These are just a few examples of how we will need to adapt for this new reality. Further investments will be needed in infrastructure, systems, and services, to provide the real-time contextual XR interactions people will come to expect.

- Most back-end systems used in the finance and insurance sector already struggle to deliver information in pseudo real-time for today's digital requirements. Tomorrow, these systems will need to deliver the same information in real-time for interactions that require sub-second response times.

- To provide the right information in the right context, heavy use will be made of geo-location services and real-time 3D image recognition services.

Whether it is dealing with the complexities of interacting in the Metaverse with non-binary avatars, handling the computational and networking intricacies to achieve real-time contextual mapping, figuring out the legal and social ramification of privacy in a virtual world, or simply the need to resource or upskill to tackle these challenges, the scope of change the financial industry will face is considerable! We need to prepare today so tomorrow we will be able to reap the benefits of higher customer engagement and increased employee productivity that these technologies are already demonstrating elsewhere.

Now is the time for financial institutions to start their transformation journey to XR.

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