Augmented Reality & Business: Bridging Virtual & Physical Gaps

By blending the physical and digital worlds, augmented reality allows us to participate in and benefit from both.
EXECUTIVE SUMMARY

Digital technology is quickly evolving – enabling businesses to continually reinvent themselves.

Heads-up displays with early forms of artificial intelligence (AI) have compelled organizations to experiment with tools that tap into the possibilities of augmented reality (AR). By overlaying digital information and objects “on top” of physical environments, AR has the potential to take consumer interactions to the next level.

While augmented reality remains in the experimentation phase for most companies, research tells us that the market is expected to grow as quickly as smartphones and tablets. Market Watch estimates that the AR market will increase from USD 2.6 billion in 2016 to 80.8 billion by 2022.1

Although AR is typically viewed as “gee-whiz” entertainment-oriented technology, it is much more than that. Pioneers see it as a way to significantly change how we communicate and share information in a consumer business context. However, as with any new technology that enables brands to connect with customers, AR must remain relevant to consumers’ needs and interests while anticipating and keeping pace with new developments.

Despite optimistic market projections, broader adoption of AR is expected to be gradual – primarily because enterprises tend to rely on the success of technology in the consumer market before turning their attention inward. Pokemon Go’s worldwide success can be traced to its innovative use of augmented reality. Such achievements in the consumer space changed how enterprises look at AR and motivated them to explore its business potential. For example, a U.S.-based pizzeria used social marketing with AR to invite customers to
download an app to set up a Pokemon Go zone. This initiative led to a 30% spike in food and drink sales over typical weekends.²

In our view, augmented reality is maturing in ways that will support internal and external experimentation. Microsoft HoloLens and Meta Vision have released developer kits for enterprises to test the technology and gain mindshare – underscoring the need to explore how AR evolves. So far, virtual reality is leading mass market adoption, predominantly due to the large-scale availability of low-cost VR devices. Yet according to Gartner, the business potential of augmented reality has increased through improvements in location services and image recognition – enabling enterprises to use it as an internal tool to complement and enhance business processes and workflows.³

As a result of these developments, a support infrastructure is emerging. Non-profit organizations such as Augmented Reality for Enterprise Alliance (AREA)⁴ with its 1000-plus labs are working to assist AR-enabled enterprises. To accelerate AR adoption, AREA members write a series of blogs that share insights and tips on the emerging AR-assisted enterprise. The company also hosts a series of domain-focused events.

We advise businesses to integrate AR into their existing processes, as well as their internal systems environment, to realize AR’s full potential and value. At the same time, companies should view AR as a future-focused technology, rather than an immediate solution for closing process gaps. In this white paper, we present opportunities that enterprises can take advantage of today. We also examine how integrating AR into an existing work environment can enhance and unify communications, enrich learning and skills, and deepen knowledge.
Outlining the Enterprise Opportunity

AR augments the physical world with digital information, whereas virtual reality (VR) replaces it. Applications for augmented reality are manifold. Over time, AR is expected to play a key role in a variety of production and assembly processes; for example, providing support for those working on individual custom products made in “mom and pop” shops or by specialized welders. At the other end of the spectrum, augmented reality can potentially play a role in high-volume, low-mix manufacturing in factories with automated and specialized machines.5

Innovative companies such as Ikea, Mitsubishi, Toyota, and Lego have explored various ways to showcase the prowess of AR-based solutions. Figure 1 details how these businesses are leveraging augmented reality for marketing purposes.6 Figure 2 on the next page lists their high-level goals.
THE MANY FORMS OF AUGMENTED REALITY

MAR (mobile augmented reality) solutions are designed for mobile devices, such as smartphones, as well as for tablets and/or wearables.

A rudimentary form of AR are heads-up displays, or HUDs, such as Google Glass, Moverio, and Daqri AR helmet, which simply display information on a small screen near the user’s eyes. Microsoft’s HoloLens and Metavision’s Meta 2 are a more advanced form of AR, sometimes referred to as mixed reality, in which the technology places digital objects into a user’s field of view where they can manipulate those items. These objects are also called holograms. For example, in one Microsoft HoloLens demonstration, wearers build digital Minecraft structures on a real, physical table placed in front of them.⁷
THE VALUE OF AUGMENTED REALITY

Market watchers have yet to quantify AR’s true enterprise value; however, that is expected to change in the near future as consumer success stories and cheaper devices emerge. From enabling seamless collaboration to reducing product design iterations, augmented reality will soon be embedded in everyday work life. As we write, we see signs of the momentum building:

- More than 150 companies in multiple industries, including 52 of the Fortune 500, are testing or have deployed AR/VR solutions.
- Venture Capital and corporate investments in AR/VR start-ups totaled $2.3 billion in 2016 - an increase of 230% from the previous year.
- New AR/VR hardware from at least five companies, including Microsoft and HTC, hit the market in the last year, with some of these products targeting enterprise use.

Businesses Applications

Interactive Printing

Having customers engage with a product is the key goal of any marketing plan. In the case of augmented reality, its immersive capabilities are a prime selling point for consumers and enterprises alike. Take interactive printing techniques. Companies can release promotional materials, such as brochures, paper print ads, flyers, banners, and billboards, that can then be scanned through an app. With a single scan, customers can unlock an entire collection of augmented products, then place and position them in any space at any time. As such, AR helps companies connect with their customers in entirely new ways.

Interactive printing techniques can be used to:

- Give customers more buying power by simulating products before the purchase.
- Present/pitch concepts for complex projects.
- Generate leads.

Empowering Sales Personnel

Demonstrating products and ideas will be easier with AR. Imagine a sales representative asking a vendor to stock his company’s energy bars. Augmented reality can help the sales rep showcase the
nutritional values of the product, check available inventory, and refer to real-time sales data— all relayed as information and intelligence to the vendor while helping the salesperson close the deal faster.

Another case in point: A sales representative wants to help a customer set up their store. Using an AR solution, the sales rep helps the customer to visualize how merchandise displays can be positioned in the store—enabling the vendor to better assist customers regarding product placement, and make maximum use of space and visibility.

**Domain Based Digital Data Applications**

**Healthcare**
Augmented reality will influence health care in many ways—from how medical students learn about the human body, to consultations with doctors in remote places via conference chat, to less-invasive surgeries that enable physicians to “look” into a patient without making an incision. AR/VR applications are also a good fit for therapies that counsel patients on how to cope with conditions such as post-traumatic stress disorder (PTSD), pain management, and engage in rehabilitation.11

**Design/Architecture**
One of the key challenges for designers and architects is finding a way to experience the physical spaces, structures, and objects they create. Today, most create 3-D objects on 2-D screens. AR will allow designers to visualize 3-D content while they design it in 2-D and, just as important, display their work to prospects and clients in a comprehensive way.

**Logistics**
Improving efficiencies and safety for workers is a key requirement for running warehouses. An AR application can lead a warehouse worker safely and quickly to the exact location of an item and remove it for shipping. The warehouse system removes the item from inventory then sends it to a designated location for packing and shipment. GE has experienced productivity gains across seven of its business units by employing AR-based technology. Warehouse order fulfillment tasks were completed 46% faster, since workers did not have to refer to a workstation. They simply pulled up inventory information on their smart glasses.12

**Manufacturing**
Imagine a company with multiple factories in different locations, but just a few mechanical engineers to keep the lines running inside those plants. With AR, the company could equip technicians in each plant with AR technology—allowing remotely located mechanical engineers to view and interact with the machinery from wherever they happen to be. AR headsets can also serve up blueprints, instruc-
tions, and real-time data – freeing workers to perform tasks hands-free.

**Aerospace**

Industrial AR applications can increase agility and drive competitive differentiation. A recent example is Boeing, which uses AR glasses to guide technicians as they wire hundreds of planes each year. As a result, the company reduced production time by 25% and lowered error rates to nearly zero.13

**Services**

Services are the most likely area for consumers to have their first exposure to high-end AR technology. Imagine a situation where you can rent both the tools for completing a home-improvement project, as well as the AR equipment that allows you to access an expert who can walk you through the more complicated steps.

**Consumer Applications**

**Sampling Products**

Augmented reality is a great proposition for commercial and retail players, since differentiating the shopping experience is more important than ever. Many companies, such as Nike, Converse, GAP, and Ikea14, offer AR-based solutions via mobile apps that enable consumers to visualize products in realistic 3-D. They can visualize items in the physical store online, from wherever they are. For example, a shopper planning to buy a coffee table or sofa can see the lifelike 3-D projection of the merchandise, and move around the space to view the product from various angles. This experience is a game changer for consumers since it gives them more convenience and more control over their shopping choices.

**Enhancing the Customer Experience**

Imagine walking into an unfamiliar environment, such as a museum. Using the museum’s AR-based navigation system, you can receive a guided tour of various areas of the museum and access information about its exhibits - adding another dimension to virtual interactivity and enhancing your experience in the museum.

Brick and mortar stores can also combine technologies to create a unique in-store experience and opportunities for direct marketing. For example, retail enterprises are working to enable a seamless shopping journey by connecting with their customers at different touchpoints. A customer looking to purchase a couch can visualize the 3-D augmented version of the item in their home using a smartphone. Through the smartphone’s location services, the shopper can find out where the product is available and how to get in touch with the retailer. When the customer walks into the physical store, sales personnel are already aware of what the customer wants to purchase. Meanwhile, the smart-
phone app uses indoor navigation technology to guide the customer to the area inside the store where the couch is located. In large retail stores, where finding a product can consume a lot of time, a seamless transition from home to store is a welcome change.

**LOOKING AHEAD: AR’S PATH FORWARD**

The quickly evolving technologies of AR, VR, AI, predictive analytics, and robotics promise to dramatically alter the business landscape. These technologies – once the stuff of science fiction – have earned acceptance and a seat at the table in enterprise environments through their validated business impact.

We believe that for businesses adopting augmented reality, the technology must deliver credible business value to users. It cannot be force-fed. Many existing point solutions do not contain any redeeming business value, nor give users enough reason to buy or try again – defeating the purpose of adopting AR technology in the first place.

The impact of the technology must be a few bars above the traditional forms of brand engagement practices. Google Tango is a good example. It captures the depth of information, senses physical motion, contextually maps the physical space around it, and stores the information so it can be easily recognized later. This capability elevates the concept of experiencing augmented reality and enhances its value proposition. There are limitless applications for augmented reality. For the purposes of this paper, we discussed only a few. AR can fit seamlessly into existing applications and platforms, including gamification for customer engagement, AR applications, social media-based marketing, and enterprise collaboration for unified workplace communications (e.g., Microsoft HoloLens for assessing insurance risks).

We believe that the future of shopping is highly dependent upon customers leading the way on the path of their choice. Integrating AR with technologies such as beacons and RFID can help brands personalize and distinguish their services.

Businesses are always looking to bring more value to the table. Augmented reality can bridge the gap between customer expectations and business products and services. Although this is an over-simplified way of viewing the AR roadmap, it is nonetheless imperative that companies combine the best aspects of the virtual and physical worlds to generate new, engaging, interactive, and personalized experiences that benefit both customers and the business.
Cognizant Digital Technology Labs is a technology-driven unit focused on delivering digital experiences to customers. Here, we enable new and interactive experiences that draw strengths from the Internet of Things (IoT). We aim is to build capabilities for leveraging the endless opportunities in the digital space and its impact in the future in faster, better, and more innovative ways. We explore and create new experiences using connected things, sensors, wearables, emerging tactile interfaces, and more.

Our lab experiments traverse internal and external stakeholder experiences. We build solutions that use existing digital data and bring them into an experiential review state. We also build concepts "from scratch" to create an immersive virtual world that allows users to interact in the most natural way possible.

Our strategic initiatives are designed to:

- Explore and prepare for technologies of the future.
- Power technology-driven transformations.
- Establish a technology culture.
- Accelerate adoption of technologies and competencies.
FOOTNOTES


3 Gartner Says Augmented Reality Will Become an Important Workplace Tool. http://www.gartner.com/newsroom/id/2649315,

4 AREA. http://thearea.org/

5 NEW AUGMENTED REALITY CASE STUDIES SUGGEST PRODUCTIVITY IMPROVEMENT. http://thearea.org/new-augmented-reality-case-studies-suggest-productivity-improvement/


14 Top Ten AR Apps in the History of Mobile. https://www.intellectsoft.net/blog/top-ten-ar-apps-history-mobile

ACKNOWLEDGMENTS

Special thanks to Cognizant Global Technology Office's Vijay Venkataraman and Joseph Tobolski for their invaluable feedback during the writing of this paper.

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