INTELLIGENT MANUFACTURING SYSTEMS

Global Research and Business Innovation Program

Virtual Reality & Augmented Reality

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Virtual Reality & Augmented Reality (VR/AR)

How to Use This Guidebook

Each Virtual Reality & Augmented Reality Guidebook is created with the business growth needs of small and medium manufacturers in mind. By utilizing the information in this guidebook, you are taking the first steps to creating a competitive advantage for your company by innovating in the face of disruptive technologies.

This guidebook follows a logical flow to guide you as you learn more about Virtual Reality & Augmented Reality (see Fig. 1). Review the sections as they apply to your individual opportunities and resources, either in the order they’re presented or jump around to fit your immediate needs.

Figure 1: Virtual Reality and Augmented Reality Guidebook Information Flow

This is your toolkit for plugging into the Virtual Reality & Augmented Reality innovation network.

Together, all of our guidebooks work to uplift manufacturers through increasing digital readiness; working together to accelerate the understanding and investment in emerging technologies; and foster a culture of innovation in the manufacturing industry. We encourage you to also review the future guidebooks in this series.

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**VR and AR at a Glance**

**What are “Virtual reality” and “Augmented reality?”**

Virtual reality, most commonly referred to as simply “VR,” utilizes computer-generated simulations of three-dimensional images or environments that users can interact with in a seemingly “real” way through wearing special equipment such as VR headsets and hand-held sensors or stepping into immersive multi-screen physical environments. Augmented reality, or “AR,” is less immersive than VR, overlaying computer-generated images on real-world objects and environments, viewed through technology-enabled glasses or with a mobile-device application.

**Why do Virtual Reality and Augmented Reality matter?**

Manufacturers can achieve greater cost and time efficiencies by utilizing virtual and augmented reality technology to simulate real-world scenarios. These technologies are critical to compete and achieve scale in a global economy of larger and greater-resourced manufacturers. Many manufacturers are already utilizing and experimenting with VR/AR to better equip their technicians for machine repairs, employee training, architectural development, equipment sales, and more.

**What are the biggest opportunity areas?**

We have identified four key opportunity areas in VR/AR for manufacturers:

- **Opportunity #1: Immersive Training and Education.** Manufacturers have the opportunity to use VR to train employees in virtual, simulated worksite environments.

- **Opportunity #2: Operating and Repair Guidance.** Augmented reality shines in its facilitation of efficient employee guidance while operating or repairing equipment.

- **Opportunity #3: Site, Machine, and Parts Planning.** VR gives manufacturers the opportunity to understand machinery and tooling before it hits the manufacturing floor.

- **Opportunity #4: Sales Engagement.** Virtual reality can also be used as a technical sales tool, offering the ability to view intricacies of machinery before a purchase order is signed.

More information can be found in the Identify Opportunities section, page 9.

**What are the business benefits of utilizing VR and AR?**

Though dependent on the VR/AR opportunity area(s) you pursue, manufacturers witness many benefits from implementing these technologies. These include decreased onsite and field accidents, more efficient repairs, reduced maintenance and rework costs, increased profitability and sales, and more efficient troubleshooting. For a full list of metrics, turn to the Build the Business Case and Begin Implementation section.

**Where can I find help to get started?**

There are agencies that can assist you with the development and implementation of VR/AR solutions, hardware, and applications. There are also many free online resources, as well as educational courses offered by local universities and colleges. Go to Find Help for a list of resources to help jump start your use of VR/AR to grow your business.
**Table of Contents**

**How to Use This Guidebook** ........................................................................................................... 2

Who can I contact at IMS about IMS Manufacturing Innovation Hub & Our Partners? ........................................ 2

**VR and AR at a Glance** ....................................................................................................................... 3

What are “virtual reality” and “augmented reality?” ................................................................................. 3

Why do VR and AR matter? ...................................................................................................................... 3

What are the biggest opportunity areas? .................................................................................................... 3

What are the business benefits of utilizing VR and AR? ............................................................................ 3

Where can I find help to get started? ......................................................................................................... 3

**Table of Contents** ............................................................................................................................... 4

**Understand the Technology** ............................................................................................................... 5

Additional Online Resources .................................................................................................................. 8

**Identify Opportunities** ....................................................................................................................... 9

Opportunity #1: Immersive Training and Education .................................................................................. 9

Opportunity #2: Operating and Repair Guidance ...................................................................................... 9

Opportunity #3: Site, Machine, and Parts Planning ................................................................................... 9

Opportunity #4: Sales Engagement .......................................................................................................... 9

Benefits and Use Cases of VR/AR Opportunities ..................................................................................... 10

**Build the Business Case and Begin Implementation** ...................................................................... 13

Change Management: Building the Case Requires Data and a “Test-and-Learn” Approach ...................... 13

Processes and Frameworks for Implementing VR and AR ...................................................................... 14

Resources Needed: Technology and Staffing ............................................................................................. 15

“Quick Wins” to Get Started with VR/AR ............................................................................................... 18

Metrics for Success: How to Measure Impact .......................................................................................... 18

**Find Help with Assets and Partners** .................................................................................................. 19

**Appendix** ........................................................................................................................................... 20
To Continue Reading Please Log Into Your IMS.org Account and Go to Member Resources.

All those residing in the United States, South Africa, and Mexico (Pending) are eligible to create an account.

For more information on IMS membership please email dnagy@ims.org.