

# RUNNING SUCCESSFUL AUGMENTED REALITY PROGRAMS



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2018



forum  
europe

## Title

# RUNNING SUCCESSFUL AUGMENTED REALITY PROGRAMS

## Description

Please join this session to learn the proven best practices for running successful augmented reality programs that deliver business value in the form of improved workforce productivity, effectiveness and efficiency as well as competitive advantage by differentiating your products with AR



BAE REDUCES ASSEMBLY TIME BY 50% WITH AR



# 50%

Reduction in  
BATTERY  
ASSEMBLY TIME

**BAE SYSTEMS**

**HybriDrive**  
PROPULSION SYSTEMS

## Before

- BAE tried multiple AR techniques
- 10X the cost to create AR experiences

## After with AR

- Train people 30% more efficiently
- Battery assembly time reduced 50%
- AR animation and sequencing
- Easier to onboard workers in growing Hybridrive division

# 60%

## REDUCTION IN TRAINING TIME

### Before

- GSI trains dealers on how to use and maintain the GSI Power Dryer
- 225 PowerPoint Slides and 5HRs of Training

### After with AR

- 23 AR Targets
- Training time reduced 60% from 5 HRs to 2 HRs
- AR animation and sequencing
- Quick turn on modifications to the machinery with real-time updates to AR training material



## IDENTIFY PARTS FOR EASIER PARTS ORDERING

### • Before

- Multiple, similar forks with similar components
- Challenges configuring equipment for optimal use

### • After with AR

- Deliver augmented reality experiences
- Identify components for easier order of replacement parts
- Improve user experience with configuration information (air pressure)





# WHAT MAKES AN ENTERPRISE AR PROJECT SUCCESSFUL?



Product Technology



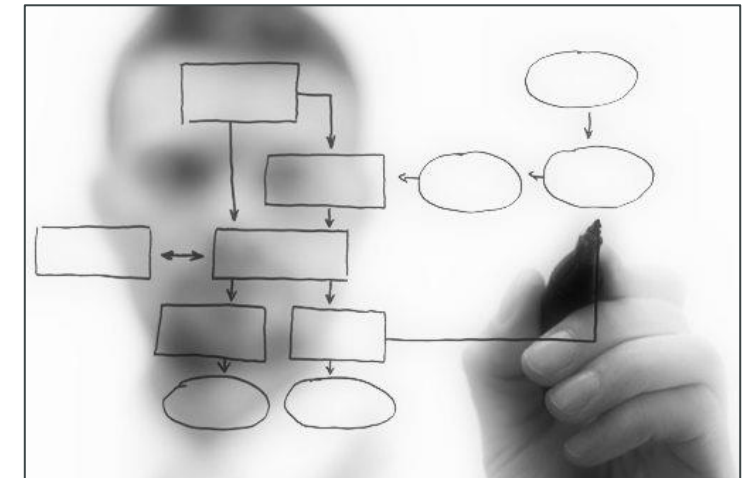
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People



Processes



# WHAT MAKES AN ENTERPRISE AR PROJECT SUCCESSFUL?



## Product Technology



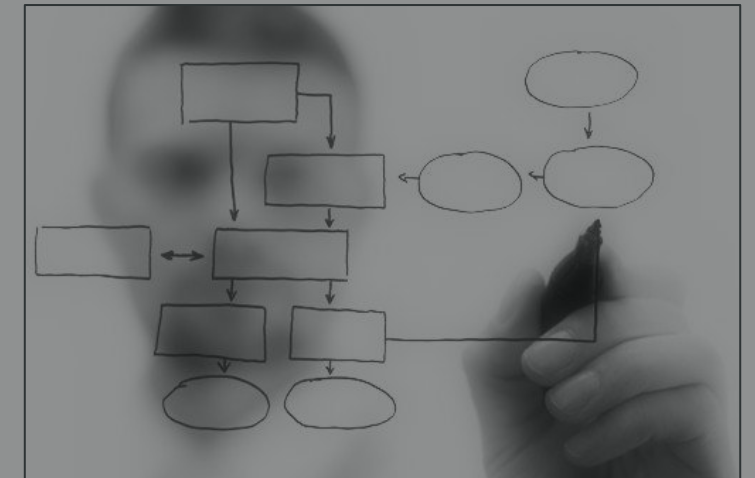
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## People



## Processes



## Typical Challenges

Connecting AR to Business Value

Identifying Use Cases

ROI/Value

Resources

Using AR Effectively


Selecting AR Hardware

3D and Process Content

Making AR Experiences Users Need and Want

Delivering Value Quickly

# 12 ELEMENTS OF SUCCESSFUL ENTERPRISE AR PROJECTS

- 
1. Identify Value
  2. Team
  3. Communication
  4. Start Small and Scale Fast
  5. Short-Term Wins
  6. AR Expertise
  7. UX Design
  8. AR Design
  9. Content
  10. PTC Customer Success
  11. Measure
  12. Get Started



# 1. IDENTIFY BUSINESS VALUE

“Top management have had enough of a motor getting disassembled - **what do we do with that?**”

- *Electronics & High Tech Corporation*

- **What are significant business problems and opportunities in your company?**
- **Identify multiple use cases and rank impact to business**
  - **Identify pain points** for with each use case
  - Clearly **define desired outcomes** e.g.
    - Simplify (a process...)
    - Shorten (time to do something...)
    - Reduce (skill level required.....)
  - Calculate the **ROI**
    - ...and over what amount of time



# 1. IDENTIFY BUSINESS VALUE

“Always focus on **squeezing down the development time** or making the **throughput** at the factories **higher** or **training is faster**. Show clear and visible evidence - **higher quality, fewer defects**, highlight the value”

- *Aerospace and Defense Company*

- What are significant business problems and opportunities in your company?
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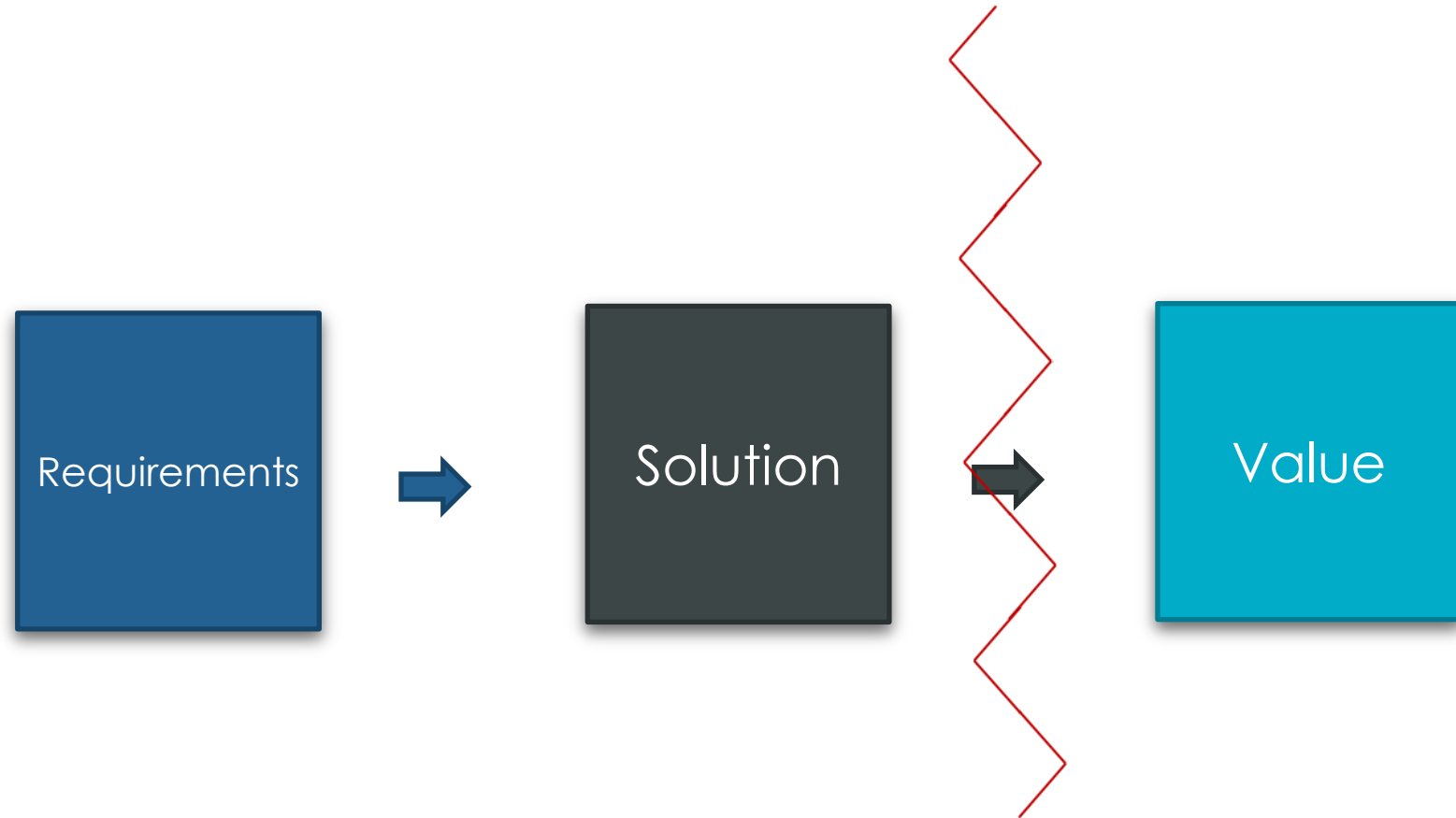




# CONNECT TO BUSINESS VALUE

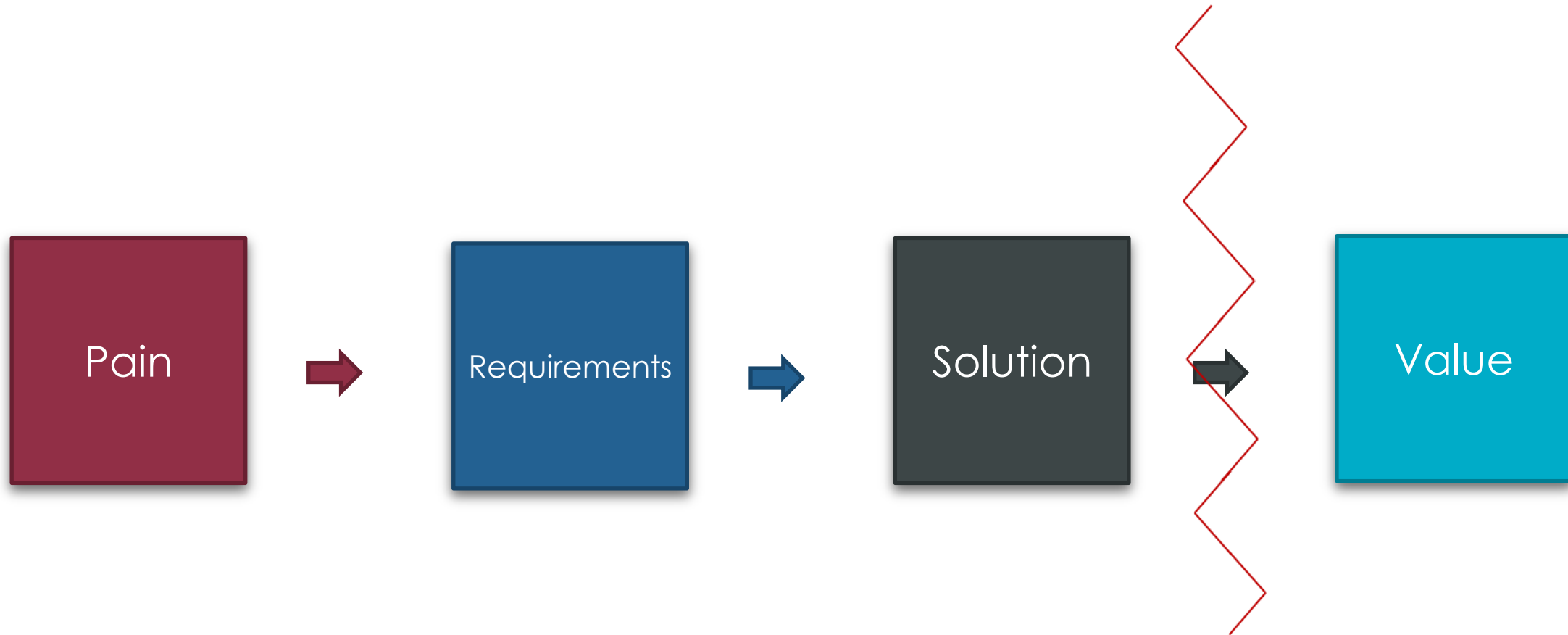


# CONNECT TO BUSINESS VALUE











# CONNECT TO BUSINESS VALUE



# VALUE ACROSS THE ENTERPRISE

| <b>DESIGN</b><br><br>17%   | <b>MANUFACTURE</b><br><br>18%   | <b>SELL &amp; MARKET</b><br><br>17%               | <b>SERVICE</b><br><br>18%   | <b>TRAIN</b><br><br>13%     | <b>OPERATE &amp; LOGISTICS</b><br><br>14% |
|---|--|---|--|--|--|
| <ul style="list-style-type: none"> <li>• Digital Design Review</li> <li>• Collaborative Design Review</li> <li>• Fast Product &amp; Component Lookup</li> </ul> | <ul style="list-style-type: none"> <li>• Maintenance Work Instructions</li> <li>• Assembly &amp; Process Work Instructions</li> <li>• Machine Set-Up and Change-Over Instructions</li> </ul> | <ul style="list-style-type: none"> <li>• Product Visualization &amp; Demonstration</li> <li>• Augmented Brand Experience</li> </ul> | <ul style="list-style-type: none"> <li>• Augmented Procedural Guidance</li> <li>• Service Inspection &amp; Verification</li> <li>• Remote Expert Guidance</li> <li>• Augmented Parts Identification</li> </ul> | <ul style="list-style-type: none"> <li>• Job-specific Training</li> <li>• Remote Expert Instruction</li> </ul> | <ul style="list-style-type: none"> <li>• Operator Manual &amp; Work Instructions</li> </ul>                                  |

Sample of 107 companies.  
Average of 2.3 functional areas chosen per respondent.





# CONNECT TO MANUFACTURING BUSINESS VALUE



“**Maintenance** is often **time consuming** as teams **gather information** on particular machines, parts, procedures in order to provide the best maintenance.”

1. “**Understand needed** or upcoming **maintenance**. What is the current **performance** of the **machine**”
2. “Provide **visual instructions** for the specific tasks”

- Show technician **IoT readings, machine status,** and performance
- Show technician **step-by-step maintenance procedures**

**Metric:**  
**Downtime**

Products delivered on-time, on-budget

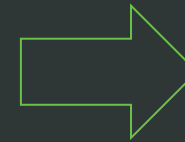
Pain



Requirements



Solution



Value



# CONNECT TO SERVICE BUSINESS VALUE



“In my service organization, **documentation is poorly organized.**”

“**People** can only **work** on the **machines** they **know.**”

“It is **difficult** to **scale** the total **number** of **service calls** we can complete.”

1. “Accurate, **relevant, documentation** for **onsite**, service technicians “

2. “Understand **machine status** and the **steps to fix** issues.”

- Deliver **up-to-date, product information** to on-site technician

- **Easy** to understand, easy to consume, **in-context service information**

- **Enable technicians**, at varying skill levels, to **work** on **different machines**

**Metric: First Time Fix rate**

Reduce the number of return service visits

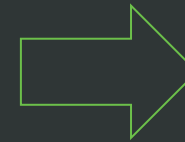
Pain



Requirements



Solution



Value



# THE VALUE OF AR IN THE INDUSTRIAL ENTERPRISE



## BUSINESS PROBLEMS

### WORKFORCE TURNOVER

As high as 31%<sup>1</sup> annual employee turnover. Time-consuming **training** for workers

### PRODUCTIVITY

## AR ROI

### TRAINING

AR Training at Scale  
50%-60% faster training time<sup>3</sup>

### EXPERT WORKER SCARCITY

Expert guidance is **expensive** and **scarce**. Industry has **52% first time fix rate**.<sup>2</sup>

### EFFECTIVENESS

### REMOTE ASSIST

AR Remote Expert Guidance  
76% remote assist without onsite visit<sup>4</sup>

### ERROR PRONE PROCESSES

Complex machines, work spaces, and processes result in **high error rates**

### EFFICIENCY

### ERROR REDUCTION

AR Work Instructions at Scale  
Near 0 error rate

### COMPETITIVE ADVANTAGE

Industrial customers see AR as a competitive advantage when bundled with their products and services

### DIFFERENTIATOR

### VALUE ADD TO INDUSTRIAL PRODUCTS

AR-Inside  
New revenue stream. Disrupt competition<sup>5</sup>

<sup>1,2</sup> Aberdeen, Aug 2018

<sup>3</sup>GSI and Hyberdrive

<sup>4</sup>Xerox (HBR)

<sup>5</sup>CIO, AR, Next Frontier for

Competitive Advantage

## 2. BUILD YOUR TEAM

“Identify a strong **champion** for innovation. **Innovation leadership** is important. **Always moving forward, a hundred people will say why you can't, keep showing them you can.**”

- Chad Crandell



- **Executive Sponsor**

- Executive champion driving vision and success
- A CXO, Innovation Leader, Digital Transformation Leader, Industrie 4.0 or Made in China 2025 Leader

- **Business Lead/Owner**

- Drives business success relentlessly overcoming business problems and opportunities
- Responsible for manufacturing, field service, product development, training, or sales and marketing

- **AR Team**

- From Manufacturing, Technical Documentation, Training, Field Service, Innovation, Product Development, R&D, or IT
- Skills include: domain expertise, UX/UI Design, AR Design, 3D Design and Engineering, Application Development (Javascript, HTML, CSS) Optionally: IoT Data Integrations

### 3. COMMUNICATION WITH YOUR TWO CUSTOMERS

**“Initially we created five great AR Experiences** - really quite good. This removed the need for imagination – **people instantly understand and get it**

- *Aerospace and Defense Company*

#### 1. Sponsors & Stakeholders Drive the First Phase of an AR Project

- Start in sell mode to convince the business for funding
- Educate the company on the value of AR and what AR is first if you have too!
- Identify value for various departments & stakeholders
- Identify the data to calculate ROI





### 3. COMMUNICATION WITH YOUR TWO CUSTOMERS

**“To maximize the power of Augmented Reality, organizations need to bring actual practitioners in at every stage of the implementation process.”**

*- Tom Paquin Research Analyst, Aberdeen Market Intelligence Company*

#### 1. Sponsors & Stakeholders Drive the First Phase of an AR Project

- Start in sell mode to convince the business for funding
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#### 2. End-Users Reveal Insights into Value

- What really matters to users
- Operations Metrics & KPIs
- Costs/benefits that stakeholders care about



## 4. START SMALL AND SCALE FAST



“No one is smart enough to lay out a full roadmap - **get started and the milestones will reveal themselves** with time.”

- Innovation Director

“Over time we did **POC's & prototypes**, learned the tech, learned limitations and strengths. **Iterating allows us to find what delivers value and what doesn't**”

- AR Team Project Manager

- **Start Small & Scale Fast**

- Make sure your solution provides the value first
- Roll out to a test audience
- Iterate rapidly and Experiment a Lot
- When value proven, roll out at scale

- **Take a phased approach to AR Experience Development**

- Incremental, phased development of an experience can help to validate key usability strategies and accelerate time to value

- **Develop with Multi-Devices**

- Scale with mobile and tablets to give everyone the ability to experience
- In parallel run innovation projects that involve wearables

# 5. GENERATE SHORT-TERM WINS

**“Start simple**, tie directly to a **business challenge**, **deliver**, get **buy in** from other teams and **grow!**

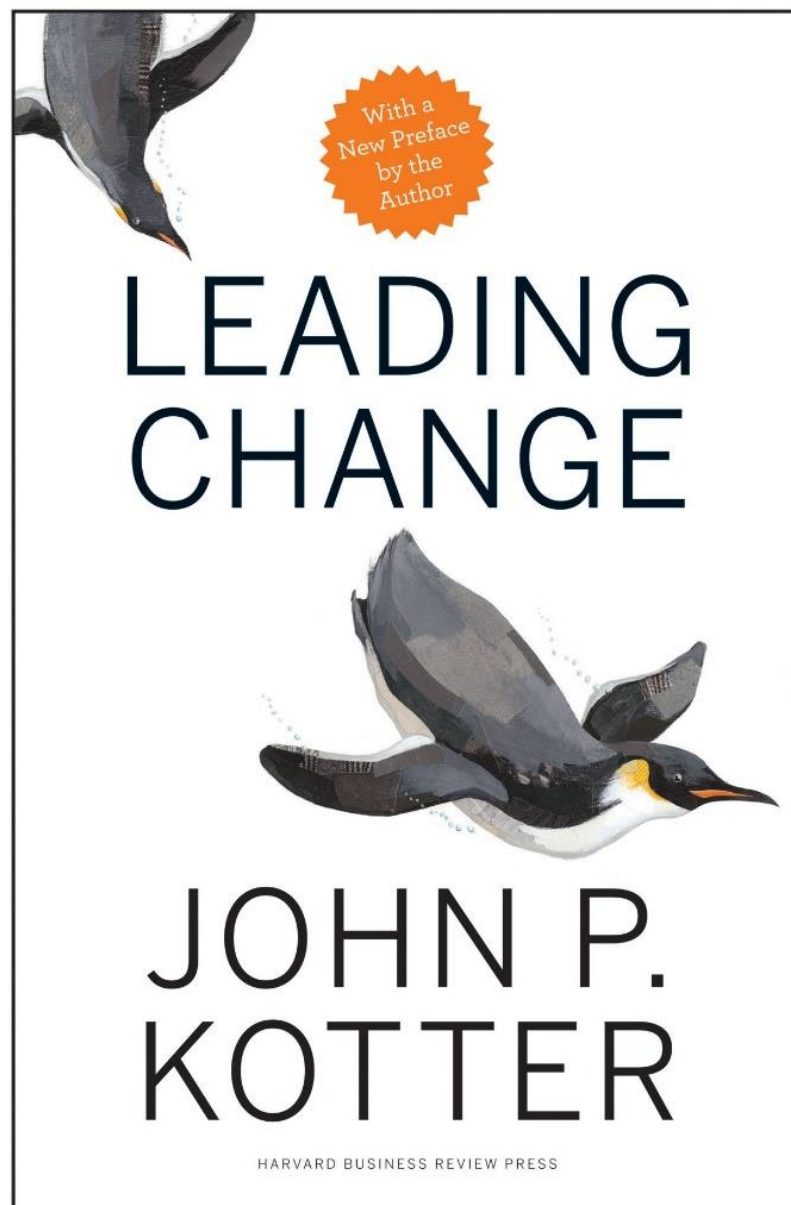
That’s how we began and now all the product managers want AR experiences for this on all their products”

- AR Team Project Manager

- Pick something simple
- Significant potential business value
- High impact
- Make first one really, really good
- Don’t make it too cool and or with too much “wow!” ... Focus on useful
- Deliver!

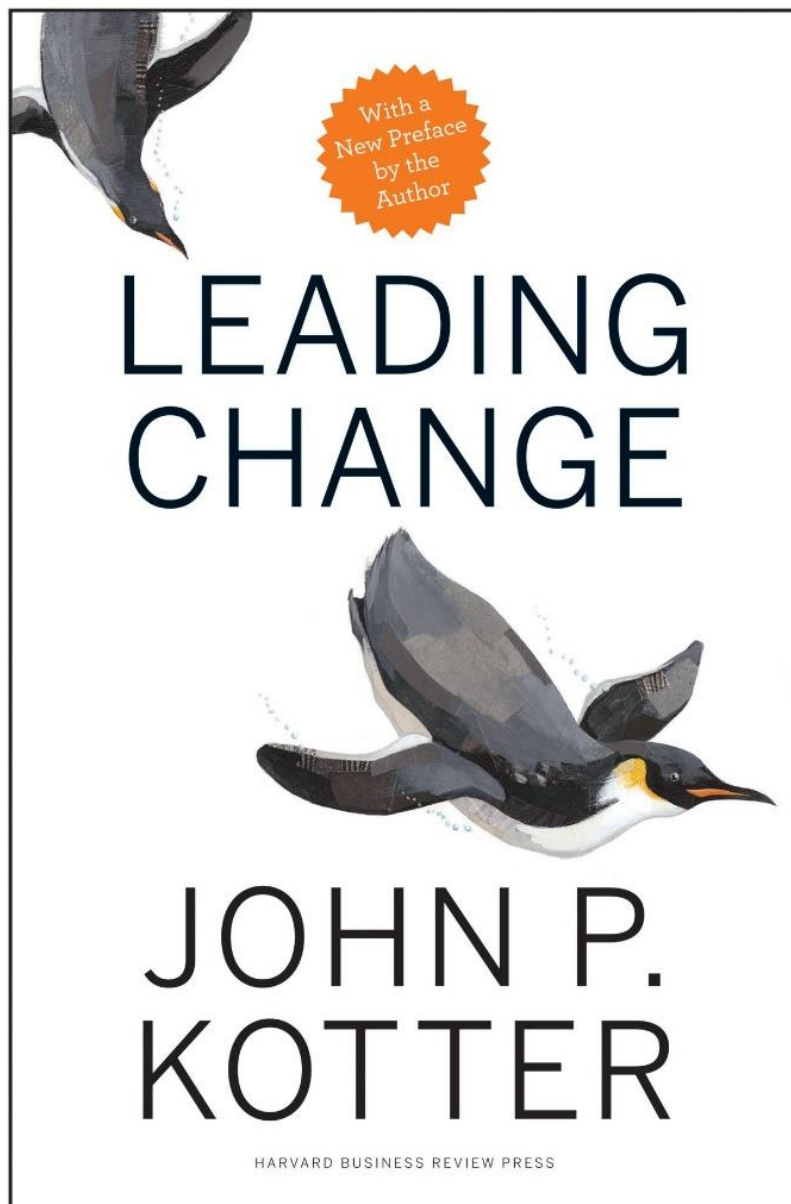






## Driving Change Requires 8 Key Steps:

1. Establish a sense of urgency
2. Create a guiding coalition
3. Develop a vision & strategy
4. Communicate the change vision
5. Empower employees for broad-based action
- 6. Generate short-term wins**
7. Consolidate gains and produce more change
8. Anchor new approaches in the culture



- It's critical to maintain the belief and support for the change
- Generating some quick wins helps to maintain belief, keeps the critics at bay and refuels the momentum
- Short term wins need to be visible, unambiguous, clearly related and authentic

# 6. BUILD UP AR EXPERTISE



## ONLINE LEARNING

Onboard and upskill your workforce with on-demand training delivered online.

- Tutorials
- Courses
- eLearning Libraries
- Mentoring



## CLASSROOM TRAINING

Accelerate and deepen skills with industry experts through remote and face-to-face training sessions.

- In-Center
- Onsite
- Virtual Classes



## LEARNING SERVICES

Personalize training enablement with consulting services focused on your business use case.

- Assess training needs
- Strategize on plan
- Execute program
- Optimize accordingly
- Blended training programs



# 7. UX DESIGN

“Warning – there is a **huge change in the UX** with Augmented Reality!”

- *AR Team Project Manager*

“Don’t burden the user – **guide them to success via UX**”

- *Vinny DaSilva, Principal Product Manager, Vuforia*



- **UX Design**

- Staff team with UX Skills
- Follow Available AR Design Patterns and Style Guides

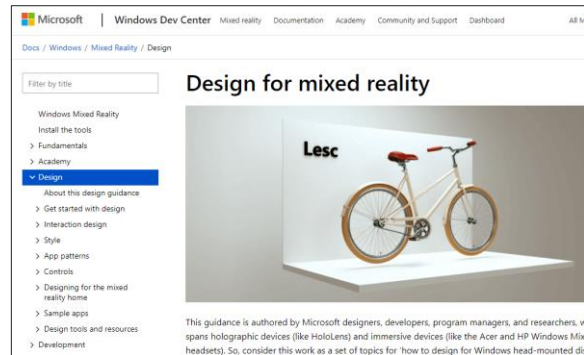
- **User Centered Design**

- Involve your target user community early and often
- Invest time up-front to properly document the Use Case and detailed Story Boards
- Helps sets expectations for development effort and can greatly accelerate experience development

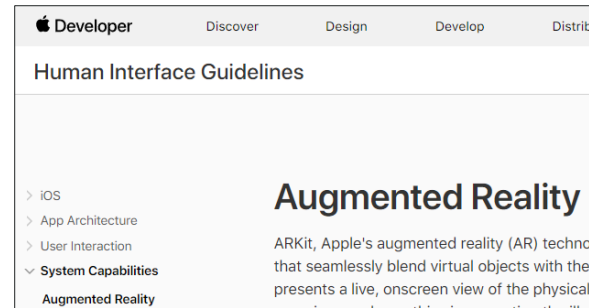
# 8. FOLLOW AR DESIGN BEST PRACTICES

## AR Designs Guidelines

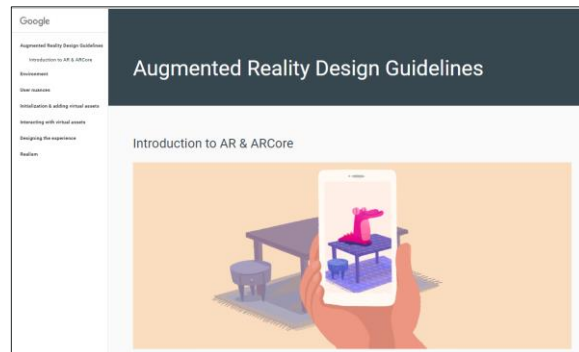
### Microsoft



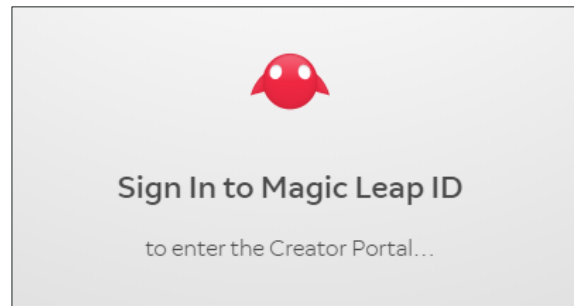
### Apple



### Google



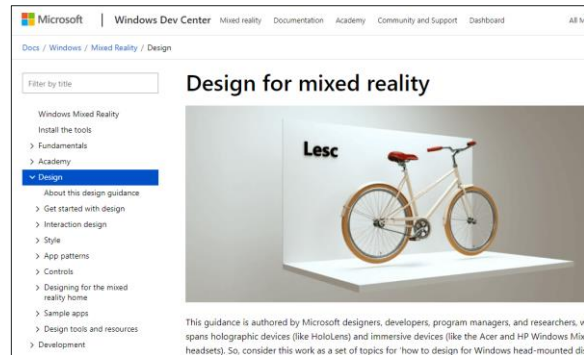
### Magic Leap



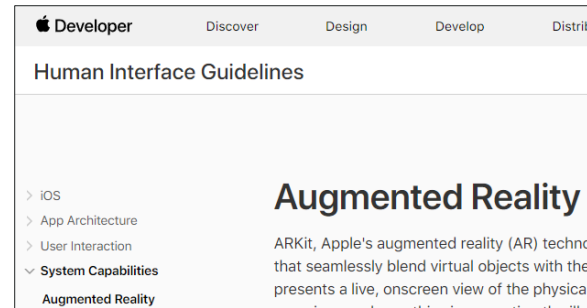
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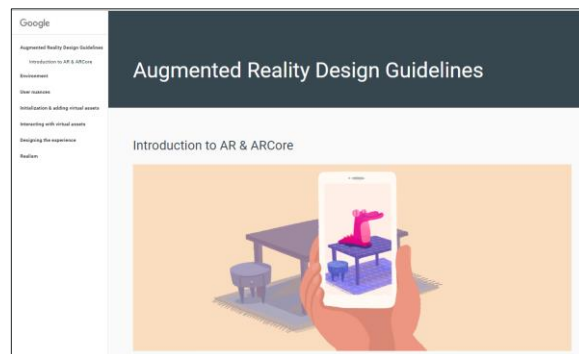
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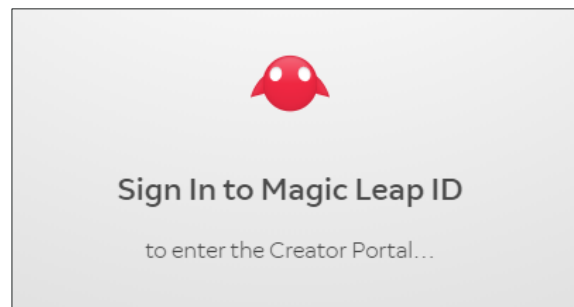
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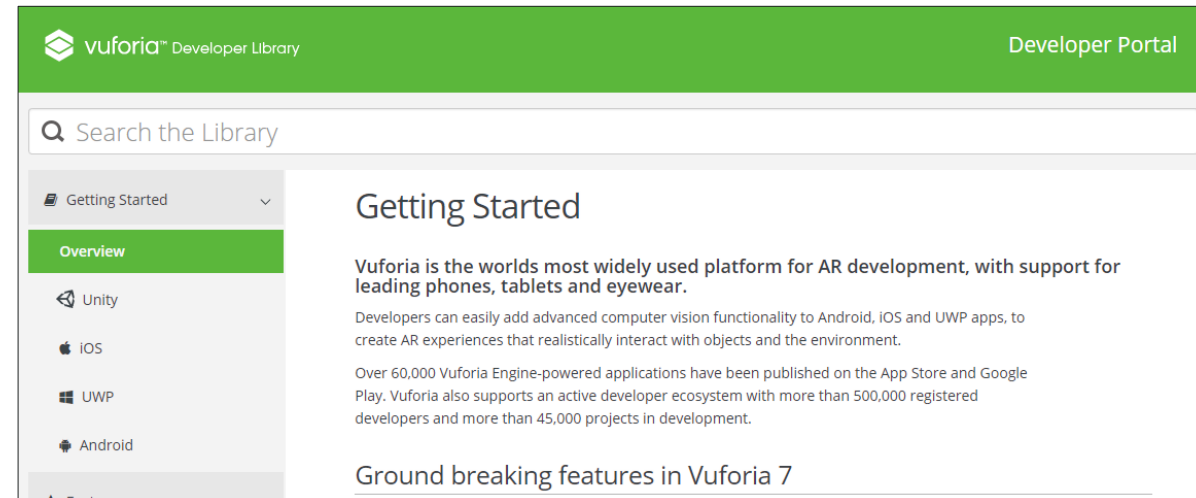


### Magic Leap



## From PTC

### Five Steps to Create a Meaningful AR Experience



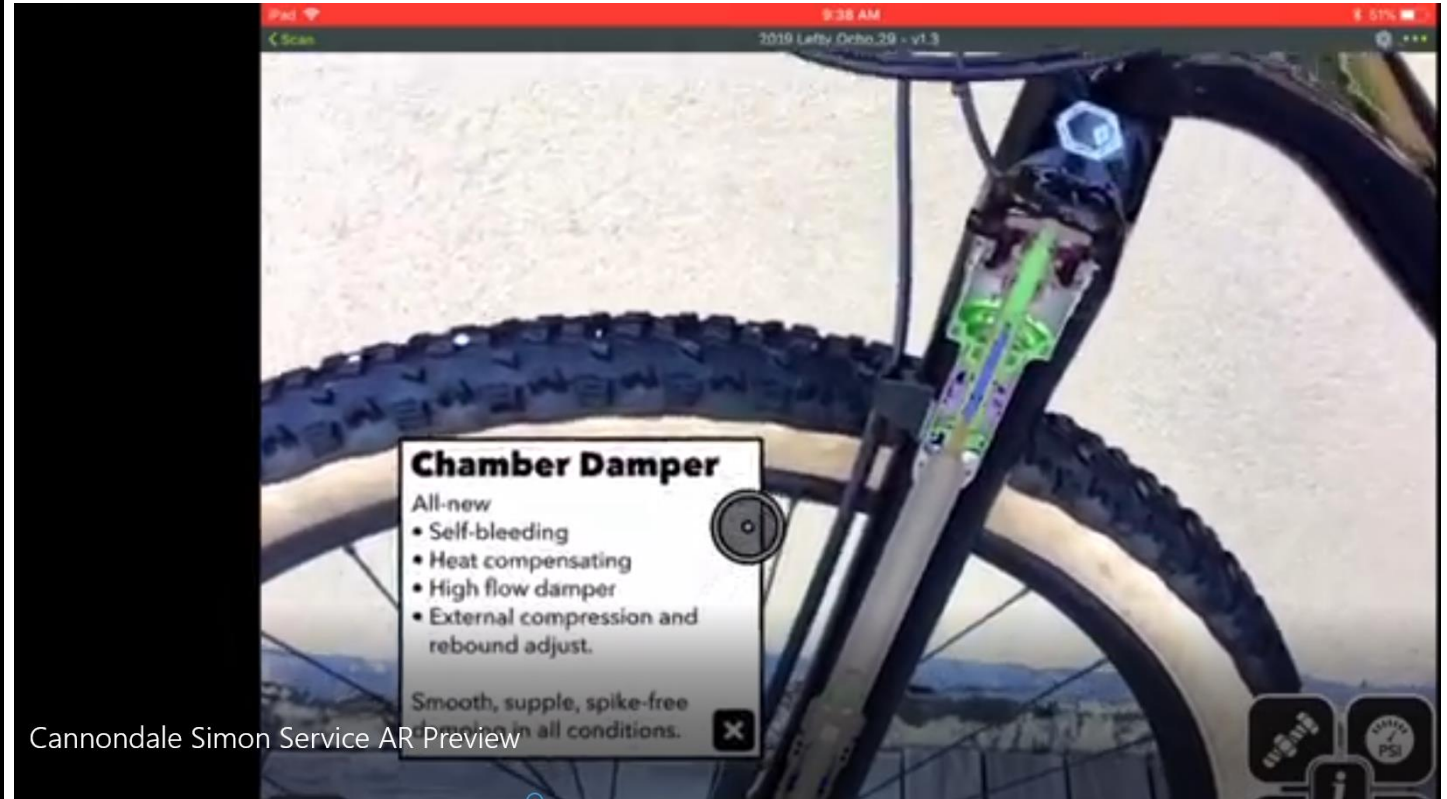


**AUGMENTED  
REALITY**







# 9. AR IS ONLY AS GOOD AS THE CONTENT

- Have a Strategy for Identifying and Preparing Digital Assets
- AR Experiences are made of various content including:
  - CAD Data (*Validate Your CAD data*)
  - 3D model data
  - animated sequences
  - Images
  - Graphics
  - Photos
  - Videos
  - Audio
  - Pdfs
  - Text



Cannondale Simon Service AR Preview

# 10. LET PTC CUSTOMER SUCCESS HELP YOU

| STARTER<br>SUCCESS PLAN  | GUIDED<br>SUCCESS PLAN   | MANAGED<br>SUCCESS PLAN   | STRATEGIC<br>SUCCESS PLAN   |
|--|--|---|---|
|   |    |    |    |
| <b>Customer Success Management</b> <ul style="list-style-type: none"> <li>Online Success Guide</li> <li>Onboarding (90 days)</li> <li>Adoption Monitoring</li> </ul> | <b>Customer Success Management</b> <ul style="list-style-type: none"> <li>Proactive Guidance</li> <li>Executive Yearly Business Reviews</li> </ul> | <b>Customer Success Management</b> <ul style="list-style-type: none"> <li>Named Resource</li> <li>Proactive Guidance</li> <li>Executive Quarterly Business Reviews</li> </ul>   | <b>Strategic Success Management</b> <ul style="list-style-type: none"> <li>Semi-Dedicated Named Resource OR                             <ul style="list-style-type: none"> <li>Dedicated Named Resource</li> </ul> </li> <li>Executive Quarterly and Yearly Business Reviews</li> </ul> |
| <b>Expert Sessions</b> <ul style="list-style-type: none"> <li>Access to Recorded Sessions</li> </ul>   | <b>Expert Sessions</b> <ul style="list-style-type: none"> <li>Access to Live/Recorded Sessions</li> </ul>  | <b>Technical Support Account Manager (TSAM)</b> <ul style="list-style-type: none"> <li>Optional Named Resource</li> </ul> <b>Expert Sessions</b> <ul style="list-style-type: none"> <li>Access to Live/Recorded Sessions</li> </ul> | <b>Technical Support Account Manager (TSAM)</b> <ul style="list-style-type: none"> <li>Named Resource</li> </ul> <b>Expert Sessions</b> <ul style="list-style-type: none"> <li>Access to Live/Recorded Sessions</li> </ul>  |
| <b>Advisory Services</b> <ul style="list-style-type: none"> <li>Performance Assessment</li> </ul>  | <b>Advisory Services</b> <ul style="list-style-type: none"> <li>Discovery Workshop (2-Hour)</li> </ul>   | <b>Advisory Services</b> <ul style="list-style-type: none"> <li>Leverage Success Points</li> </ul>  | <b>Advisory Services</b> <ul style="list-style-type: none"> <li>Leverage Success Points</li> </ul>  |
| <b>PTC University</b> <ul style="list-style-type: none"> <li>eLearning Standard Library</li> </ul>   | <b>PTC University</b> <ul style="list-style-type: none"> <li>In-Center Training</li> </ul>   | <b>PTC University</b> <ul style="list-style-type: none"> <li>In-Center Training</li> </ul>  | <b>PTC University</b> <ul style="list-style-type: none"> <li>Leverage Success Points</li> </ul>   |
|  | <b>Success Points</b> <ul style="list-style-type: none"> <li>50 Success Points included</li> </ul>   | <b>Success Points</b> <ul style="list-style-type: none"> <li>80 or 100 Success Points included</li> </ul>   | <b>Success Points</b> <ul style="list-style-type: none"> <li>200 Success Points included</li> </ul>   |

POINT-BASED SERVICES INCLUDING RAPID OUTCOMES, ADVISORY SERVICES, PROFESSIONAL SERVICES, EDUCATION SERVICES AND SUPPORT SERVICES



# 10. LET PTC CUSTOMER SUCCESS HELP YOU

## STARTER SUCCESS PLAN

## GUIDED SUCCESS PLAN

## MANAGED SUCCESS PLAN

## STRATEGIC SUCCESS PLAN

“I am so glad my Customer Success Manager has been there to **support me the entire way**. She’s fantastic and I couldn’t have asked for a better person to support me. If I ever have any questions, **she always has the answer**, and if not, she finds it quickly, and checks up on me often which is great because it reminds me to **look into what PTC can do for us**. She is truly amazing!”

– Danae Goldammer, North America Product Manager, ESAB

POINT-BASED SERVICES INCLUDING RAPID OUTCOMES, ADVISORY SERVICES, PROFESSIONAL SERVICES, EDUCATION SERVICES AND SUPPORT SERVICES

# 11. MEASURE



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**HybriDrive**  
PROPULSION SYSTEMS

CANNONDALE IMPROVES AFTER MARKET SERVICE WITH AR

# IDENTIFY PARTS FOR EASIER PARTS ORDERING

**Before**

- Multiple, similar forks with similar components
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- Deliver augmented reality experiences
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**cannondale**

LINK MFG REDUCES MARKETING COSTS WITH AR

# REDUCE MARKETING EVENTS COSTS

**Before**

- Shipped Truck Chassis to marketing events (estimate \$20-30K)
- Difficult to support events outside US

**After with AR**

- Able to demonstrate truck chassis and features
- Show product differentiation
  - Configurations
  - Dimensions
  - Quick Assembly Time
- Easy to distribute

**Link**  
MFG.

GSI REDUCES TRAINING 60% WITH AR

# 60%

REDUCTION IN  
TRAINING TIME

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- 225 PowerPoint Slides and 5HRs of Training

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## CONNECT TO BUSINESS VALUE

### SERVICE

- Augmented Procedural Guidance  
**Improve First Time Fix = Lower service costs**
- Remote Expert Guidance  
**Remote expert help = Less travel costs**

### SELL

- Product Visualization & Demonstration  
**Compelling Product Demonstrations = Greater Revenue**

### MFG

- Assembly & Process Work Instructions  
**Improved Validation and Training of New Process = Faster Ramp Time**
- Machine Set-Up & Change-over Instructions  
**Clear Instructions = Less Downtime**



## 12. GET STARTED



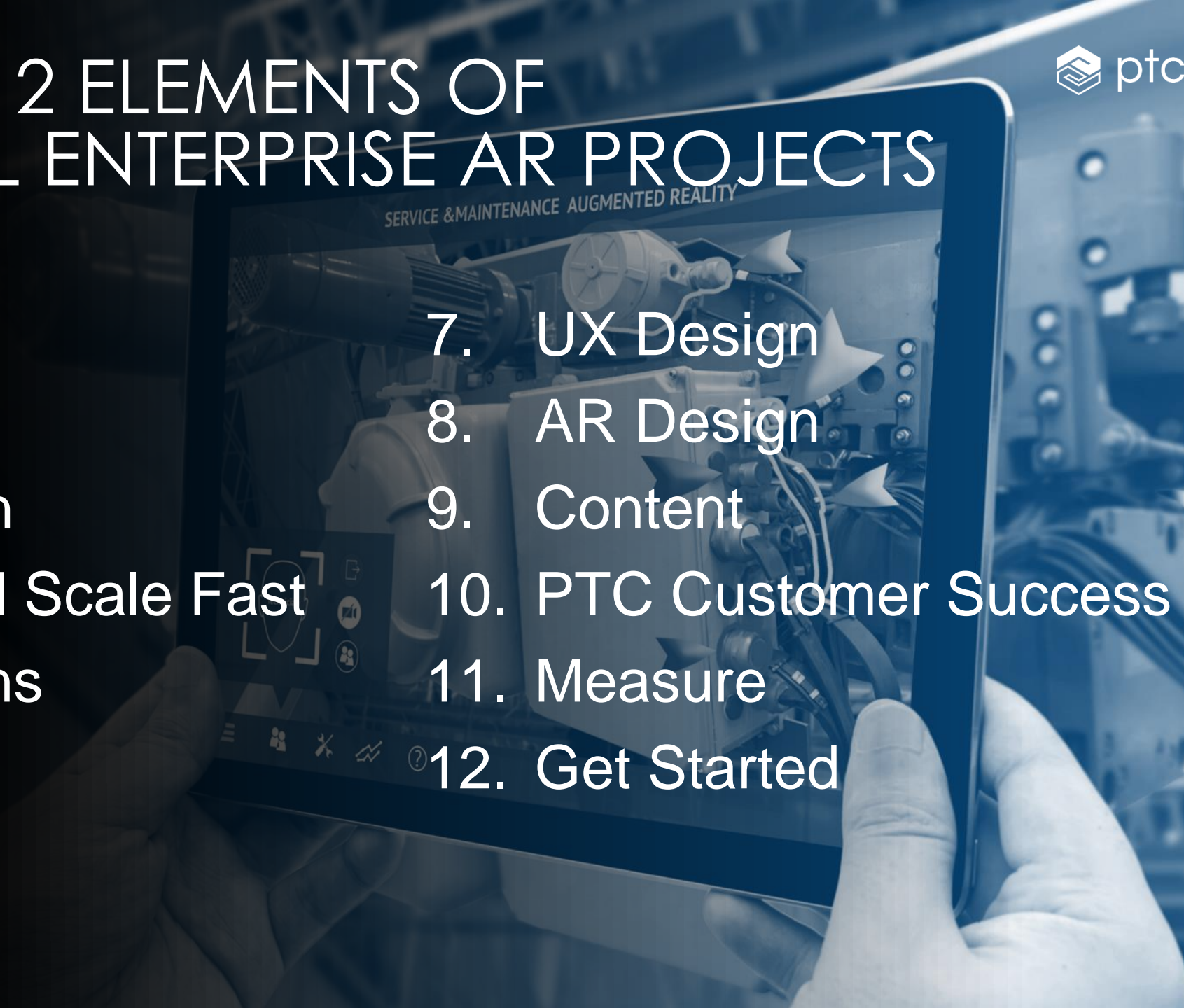
“A large percentage of companies have already recognized this technology and are moving fast to embrace this revolutionary technology. If your company has a focus in any of the noted key areas — from services to training to sales and marketing to manufacturing — **it is time to get started.**”

**Tom Mainelli, IDC**

Whitepaper: How Augmented Reality Drives Real-World Gains in Services, Training, Sales & Marketing, and Manufacturing



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# QUESTIONS?



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**RUNNING SUCCESSFUL  
AUGMENTED REALITY  
PROGRAMS**





# RUNNING SUCCESSFUL AUGMENTED REALITY PROGRAMS



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2018



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# RUNNING SUCCESSFUL AUGMENTED REALITY PROGRAMS



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