The Ultimate GUIDE TO MR PILOTS

An eBook for Industrial Enterprise

KOGNITIV SPARK

Introduction

Since the term Industry 4.0 rose to prominence in the early 2010s, industrial organizations have been moving to adopt technologies that can better connect and augment their operations. The first step of implementing any new technology is the pilot.

Innovation, process improvement, and executive teams are aware of the potential ROI from successful deployments of Industry 4.0 technologies and understand that pilot efforts are necessary for the long-term health and competitiveness of their organization. For industries like aerospace, defence, manufacturing, energy and utilities, among others, mixed reality (MR) technologies can help tackle several growing challenges:

- In many industrial sectors, client demands are increasing. End-products are expected faster, cheaper, and often customized.
- A shift in workforce demographics has created recruitment challenges and skills gaps. Enterprises are experiencing a shortage of high-skill personnel as the baby boomer generation retires, taking with them a lifetime of expertise.
- Competition is fiercer than ever, and organizations are forced to innovate or fall behind.

Successful deployments of MR solutions have resulted in significant ROI for industrial organizations. Following a successful MR pilot, the Boeing Company reported a wiring production time reduction of 25% with an effective error rate of zero[1].

Excitement generated by these outcomes can lead to ambitious pilot projects with the expectation of reaping significant results. These projects, however, are prone to failure due to their complexity coupled with a lack of experience.

Statistics like these are the reason many organizations take a "wait-and-see" approach. Pilot purgatory, the pilot trap, and pilot pitfall are some of the names prescribed to failed attempts to implement Industry 4.0 technologies. This guide is designed to help industrial enterprises successfully plan, run, and scale MR pilots.

The benefits of being an early adopter are well known – it pays to be first.

Early adopters are the first to reap the benefits. They become more efficient than their competition, leaving others scrambling to catch up and level the field again. They're seen as thought leaders in their industry and stand-out against competitors, attracting new opportunities for growth.

However, being an early adopter often means dealing with unforeseen circumstances and learning as you go.

1 "Boeing Cuts Production Time by 25% with Skylight on Glass." Upskill.io, Boeing and Upskill.

A study published by the World Economic Forum in 2019 found that **70%** of industrial enterprises fail to have their Industry 4.0 efforts move beyond the pilot phase, with only **29%** actively deploying solutions at scale[2].

2 "Fourth Industrial Revolution Beacons of Technology and Innovation in Manufacturing." World Economic Forum, Jan. 2019, pp. 19.

Benefits of MR for enterprise

- Optimize workforce performance. Some MR solution pilots have led to 8 - 11% increases in task performance efficiency when compared against traditional assembly techniques[3].
- Close the skills gap and improve training. BAE Systems reported a 40%-time reduction in front-line training using an augmented/mixed reality solution[4].
- Reduce workforce mental fatigue through shared visualization and 3D support content.
- Empower workers to be more confident and autonomous

3 "Getting the Torque Just Right with Skylight Could Save Millions." Upskill.io, GE Aviation and Upskill.

4. Merel, Tim. "How AR and VR Are Driving Return on Investment in the Enterprise Reality Ecosystem." VentureBeat, VentureBeat, 26 Apr. 2019, venturebeat.com/2019/04/25/how-ar-and-vr-are-driving-return-on-investment-in-the-enterprise-reality-ecosystem/.

This eBook is designed to equip you with the steps necessary to avoid pilot purgatory and manage a scalable MR pilot.

You'll learn how to:

- Plan your pilot
- Pick the right use case
- Pick the right MR solution
- Build end-user buy-in
- Deploy the pilot
- Assess the outcomes

This guide was built from collective best practices taken from successful, first-hand MR pilot programs. Use the helpful checklist and tips to drastically increase your chances of a successful MR pilot. One that impacts your bottom line and positions you and your organization as an industry leader.

13 Steps
To a Successful MR Pilot

1

Identify your pain points

Before a pilot can be planned, a pain point and its root cause must be identified.

If you don't already have an immediate problem in mind, take an inventory of specific pain points that impact your operations. Then, identify the ones that could be solved using MR for improved comprehension, training, or communications. Look for process issues that impede the flow of operations.

Without an identified root cause for the pain points, pilots become very difficult to quantify to stakeholders, KPIs become harder to identify, and pilot scope becomes difficult to define and manage.

Start by asking:

- Where is the organization losing money?
- What's the organization's largest operational expense?
- What's harming operational productivity?
- What's harming your workforce's productivity?
- What resource challenges are we facing?

> *After identifying the root cause of an issue that is causing your organization pain, focus on two to five repeatable use cases where MR could improve outcomes.*

Narrowing your use case focus increases your chances of a successful pilot because results will be easier to monitor, measure, and ultimately more accurate.

2

Define a S.M.A.R.T Scope

Defining a SMART scope will help manage the expectations of all parties involved in the pilot, while keeping the project on track and within a predefined timeframe.

Before launching a pilot, ensure each of the following criteria is met within the pilot plan:

S: Specific

The scope of the pilot must be well-defined and identify a specific result to be achieved.

When a result is defined, the desire to achieve that result increases.

What is being piloted? What will you be doing that wasn't done before? What is the pilot intending to deliver, and in what way is it expected to solve the problem?

> *Defining the pilot's specific deliverables and non-deliverables can help prevent scope creep, which is the unplanned growth of a project's scope.*

M: Measurable

The impact of the pilot must be quantifiable.

Is your pilot measurable? What KPIs can be recorded to demonstrate how the identified problem changes before, during, and after the pilot?

You will need the metrics around the use case so the pilot can be later deployed at scale.

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2

Define a S.M.A.R.T Scope

A: Attainable

Pilot goals and scope must be attainable and realistically consider the available resources within your organization.

Pilots with unrealistic goals, too many use cases, or too many end-users have been known to overcomplicate the process, resulting in poor outcomes.

R: Relevant

Project managers must ensure that:

- The pilot will affect the intended KPIs
- The pilot aligns with their company's overall goals, values and vision

> *Explicitly defining a pilot's relevance in relationship to the broader organization helps refine the pilot scope and avoid errors or misguided efforts.*

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2

Define a S.M.A.R.T Scope

T: Time-based

Your pilot must have a designated end date. If you're doing phased implementations, these phases should also have defined timelines.

> *Limiting the pilot to a specific time-frame contextualizes the data gathered and measured and manages expectations for all parties involved.*

How long is the pilot going to take? For industrial MR pilots, we recommended dedicating:

- One month of preparation
- Three months for end-users to pilot the technology
- One month dedicated to reporting and evaluation

3

Define KPIs

Successful pilots have well defined KPIs.

Depending on the use case, multiple KPIs can be measured during a specific pilot. For example, equipment downtime and travel costs are two KPIs that can be tied to the same use case.

It's beneficial to measure KPIs that can be directly linked to dollar figures. This is especially useful when planning a post-pilot deployment.

Wherever possible, record less-tangible metrics like knowledge retention.

Ensure that the infrastructure is in place to record your defined KPIs. For example, if your pilot is aimed at reducing downtime of a specific piece of equipment, confirm that you have the tools to accurately measure this KPI.

4

Establish your KPI baseline

Once the KPIs have been defined, establish the baseline data.

How is your organization performing the use case now and what are the KPIs today? It's likely that your organization is already gathering some of the required data, if not, you'll need to put the tools in place to measure the KPI baseline. Remember to assign dollar values to all applicable baseline KPIs.

Baseline data will be later used to compare against your specific SMART goals to determine return on investment (ROI).

5

Select the MR solution

> *It's important that your use case is well defined before you evaluate solution options so you know what you're trying to achieve and the features you'll require.*

This will save you the time wasted exploring other technologies that are not well equipped for your use case.

For example, MR software designed to support training might not have the features you need for assembly-related use cases.

When researching potential MR solutions, ensure you have a good understanding of the solution's strengths and features and how they align with your selected use case.

Consider the following questions:

What is the considered solution designed to do and do its functions and the pilot's objectives align?

If the answer to the second part of this question isn't yes, you expose the pilot to unnecessary risk. Be wary of conducting a pilot that misuses an MR solution. It's important to look at solutions as objectively as possible and critically evaluate both their strengths and limitations.

What are the solution's hardware requirements? What are your internal requirements?

MR hardware can range from phones and tablets to head-mounted computing systems like Magic Leap or the Microsoft HoloLens.

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5

Select the MR solution

When evaluating your hardware needs, consider the environment, conditions, location, and circumstances under which the worker will be using the hardware. Some relevant questions to consider may include:

- Is it important that the worker be hands-free?
- Are there safety certification requirements for hardware used in your environment?
- What's the battery life of the hardware?
- How strong or weak is the location's internet connectivity and will this interfere with the solution's bandwidth requirements?
- What are your organization's security requirements? Does the environment or location require specific safety standards be met? Can the solution provider meet the requirements?

Is the solution scalable?

Can the solution integrate with or support other Industry 4.0 tech or data? If your organization is collecting Internet of Things (IoT) sensor data, can the solution integrate and visualize this data? Some solutions can incorporate these data points and your existing Enterprise Resource Planning (ERP) applications.

> *It's important to consider the long-term scalability of a solution when evaluating hardware and software options.*

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5

Select the MR solution

What levels of pilot and deployment support are offered?

Solution providers offer different levels of support for pilot projects and deployments. Whenever possible, choose a solution provider who is willing to work with you and your team on-site to assist with scoping or training.

Once you've selected a solution that aligns with your goals and requirements, have your IT department review and approve the selected MR technology.

Depending on the solution, some device set-up may be required before the technology can be used (for example, account creation or asset curation). Work with the provider to determine what set-up is required before the pilot can be deployed.

6

Select two project champions

Industrial MR pilots are more likely to succeed when two project champions are selected.

One of the champions should be one at the management level and responsible for the planning, implementation, management, reporting and potential deployment.

The second champion should be at the operations level. They should be a member of the end-user group who is keen on the pilot and technology.

> *The operations champion will help promote the solution with their end-users.*

They're responsible for ensuring the solution is being used and for helping other users with any technical troubleshooting, and already have the trust of their peers.

The end-user champion should be selected during the introduction of the MR solution in step seven. Select a staff member who is excited about the technology and displays the technical proficiency to master it quickly.

7

Introduce the solution to the end-users

The human element is perhaps the most critical component of a successful pilot.

End-user buy-in is critical to the success of any digital transformation. If workers aren't motivated, feel threatened, or don't see the value, the pilot will likely fail. As human beings, we're all naturally resistant to change. It's a long hard road to getting your workforce to adopt a new technology and change existing process if they don't see the value of the change.

This means change management processes need to be in place early, even at the pilot phase, to ensure your project ambassadors can help smooth resistance and ease the transition when it's time to deploy at scale. Remember to record any adoption barriers your end-users identify or questions that come during the introduction and training phase of the pilot. Keeping track of these will help when you deploy at scale.

To earn trust early, manage employee expectations regarding the MR solution's capabilities and the pilot. This can be done by ensuring end-users understand the pilot goals, solution functionality, and potential outcomes of the project.

> *Be cautious not to oversell or miscommunicate, and most importantly, be clear about how end-users can benefit from this change in process.*

When expectations don't align with reality, mistrust in the solution can grow. This results in a lack of engagement with the solution, poor pilot results, and a work culture less likely to accept the solution when it comes time to move toward deployment.

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7

Introduce the solution to the end-users

When selecting the end-users to participate in the pilot, it's helpful to start with an engaged group of five to 10. This can lead to more successful pilots because training and usage monitoring is easier to execute.

> *Introduce the solution to end-users in an environment in which they feel comfortable and where they do their daily work.*

This sets the tone for how the technology is to be used, as an everyday tool.

If end-users are first introduced to the solution in a boardroom, they're less likely that they will adopt the technology without resistance. The solution may be viewed as a management tool, instead of a support tool designed to help them do their work. Keep the context of your use case and end-users in mind when selecting a location for an introduction to the solution.

Remember that people learn differently and at different rates. Some workers are going to require more time using the device before they fully buy-in, while others will appear to hit the ground running.

8

Train the test group

As noted in step five, wherever possible, choose a solution provider who is willing to work with you and your team on-site.

You or the provider should host a series of one-on-one training sessions between a solution expert and an end-user. End-users will need to be trained on how to operate both the hardware and the software.

Have end-users perform the solution's entire workflow - from turning it on, to performing the necessary functions, to shutting it off, and storing it - a number of times before moving on to the next user. At the end of each training session be sure to ask the end-user if they have any additional questions about the solution or the pilot.

> *Provide the end-user champion with additional levels of training because they will become the first resource that other end-users can approach with questions.*

During the training, be sure to identify the end-user champion to the rest of the group and explain their role.

9

Store the solution strategically

Store the solution close to where the end-users work and will perform the selected use case – this is a critical step in promoting uptake.

You want your users to approach the solution like another everyday tool, therefore it should be stored alongside them.

For example, if your use case involves field workers servicing pipelines and the workers store their tools in a truck, the solution should also be in the truck. If your end-users work on a manufacturing shop floor soldering wires and tools are stored in a specific location, the solution should be there, too.

10

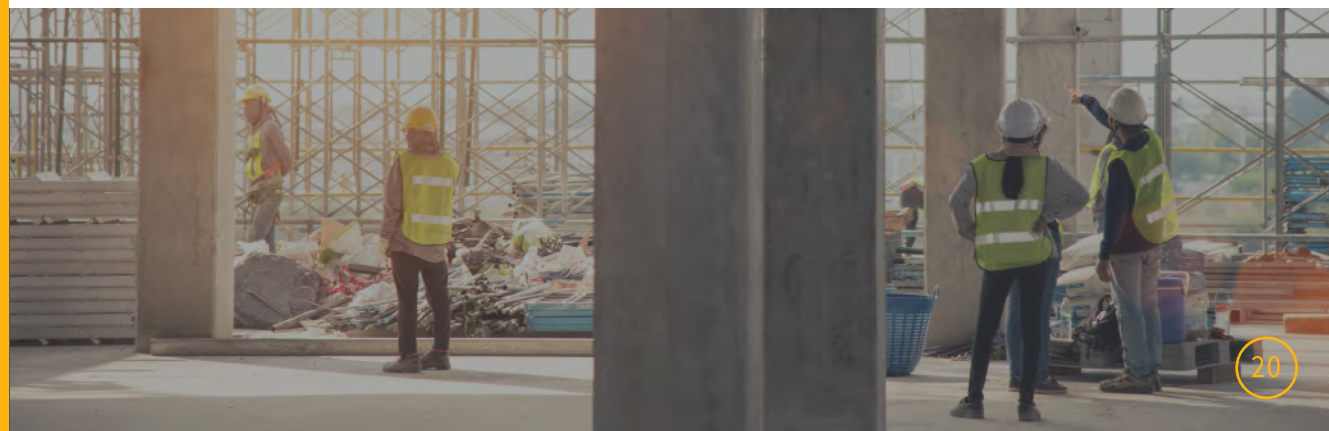
Provide ongoing, proactive support

Provide ongoing and proactive support to your end-users and champions. You should be contacting the champion at least once a week. Connect in person, wherever possible. If not possible, connect over the phone and use email as a last resort.

Encourage your end-users to be honest about their experience with the solution. Relay their technical concerns to the solution provider, if need be. They should welcome the feedback.

You're the point of contact between your workers and the solution provider. You must help them overcome any technical blockages. Use these check-ins to inform future experience and perform satisfaction interviews. While performance-based questions may vary depending on your use case and solution, be sure to ask about the following:

- How is the pilot team adjusting to the solution?
- Do you see performance improvements resulting from the solution?
- Is it getting in the way at any points in the process? Are these blockages due to lack of experience with the solution or are they unassociated with end-user skill level?
- Have you noticed any unexpected effects or outcomes that you didn't anticipate (eye strain, headaches, improvement in an area outside the identified KPIs, etc.)?



11

Determine ROI

Curate all the recorded KPI data during the lifecycle of the pilot.

In step four, baseline metrics were recorded. Compare this baseline against the new data gathered during the pilot to measure how the KPIs have changed. Take note of how pilot performance KPIs changed during different phases, if applicable.

Remember that every MR solution is different and will typically affect multiple KPIs. If your pilot measures multiple KPIs, each use case will require a separate ROI calculation.

Below is a sample ROI template from a pilot of RemoteSpark, Kognitiv Spark's industrial remote support software designed to reduce equipment downtime scenarios.

		EXPLANATION
1. Number of hardware units in the pilot	X Units	How many hardware units were used during the pilot?
2. Number of software licenses	X Licenses	How many software licenses were used during the pilot?
3. Annual number of production downtime incidents	X Incidents	How many times a year do production downtime incidents occur?
4. Average daily loss per production downtime incident	X Dollars	What is the average daily cost of each production downtime incident?
5. Average number of days per incident	X Days	On average, how many days does each incident span?

CONTINUED

11

Determine ROI

		EXPLANATION
6. Average travel cost for experts per incident	X Dollars	What is the cost associated with sending an expert to correct the production issue?
7. Annual cost of the production downtime	X Dollars	Step 3 x (Step 4 x Step 5 + Step 6)
8. Downtime reduction allowed by software	X Percentage	The percentage representing the improvement in downtime resolution during the pilot against the KPI baseline.
9. Savings	X Dollars	Step 7 x Step 8
10. Hardware and Implementation cost	X Dollars	The cost of the one hardware unit multiplied by Step 1.
11. Annual software cost	X Dollars	The annual cost of the one software license multiplied by Step 2.
ROI Year 1	X Percentage	(Step 9 - (Step 10 + Step 11)) / (Step 10 + Step 11)
ROI subsequent years	X Percentage	(Step 9 - Step 11) / Step 11

12

Perform interviews and satisfaction surveys with relevant stakeholders

Meet with end-user test group members one-on-one to gather qualitative data about the pilot, the use case(s), and their personal experience using the technology.

Be sure to ask end-users if they can identify any other applicable use cases for the solution within the organization. These ideas could lead to low-impact pilots of the same solution in other areas of your organization.

Distribute a solution evaluation survey to all end-users after the interviews are conducted. Consider asking the following, open-ended questions.

Was the solution easy to use?

Strongly Disagree Disagree Neutral Agree Strongly Agree

Additional comments?

Did the solution help you perform the use case? Was it relevant?

Strongly Disagree Disagree Neutral Agree Strongly Agree

Additional comments?

Did your expectations of what the solution would allow align with your experience using it?

Strongly Disagree Disagree Neutral Agree Strongly Agree

Additional comments?

12

Perform interviews and satisfaction surveys with relevant stakeholders

Was the solution reliable?

Strongly Disagree Disagree Neutral Agree Strongly Agree

Additional comments?

Would you recommend use of the solution to a coworker?

Strongly Disagree Disagree Neutral Agree Strongly Agree

Additional comments?

Would you like to see our organization deploy the solution throughout your department?

Strongly Disagree Disagree Neutral Agree Strongly Agree

Additional comments?

Rate your overall experience using the solution.

1 2 3 4 5 6 7 8 9 10

Additional comments?

Curate all data for final presentations of your pilot's findings to relevant stakeholders and decision makers.

13

Document the lessons learned and the key takeaways

Compile the KPI data, ROI calculations, and qualitative data from interviews and satisfaction surveys into a final report to present to decision makers.

As discussed in step 12, use qualitative data from end-users. End-user insight can be used to help identify possible change management barriers, should your organization wish to move toward deployment.

Some helpful questions to ask yourself include:

- What implementation strategies worked well?
- What did the end-users have to say about using the solution regularly?
- What were effective solution training techniques?
- What were the biggest barriers to adoption and how were they overcome?

Equipped with both qualitative and quantitative data and implementation best practices, your report should contain everything needed for your organization to determine the success of the pilot and consider planning a deployment at scale.

Checklist

Now that you know the steps required to plan and manage a successful MR pilot program, it's time to start planning your own pilot. Use the checklist below to keep your pilot moving toward a scalable MR deployment. Refer back to the 13 steps as you progress through the list.

ACTIVITIES	WHO IS RESPONSIBLE?	COMPLETED BY (MONTH)				
Plan the Pilot Implementation		1	2	3	4	5
Identify the problem and its root cause (step 1).		■				
Identify a SMART scope (step 2).		■				
Define KPIs and establish KPI baseline (step 3 & 4).		■				
Select the solution (step 5).		■				
Select managerial project champion (step 6).		■				
Introduce the solution to end-users and select end-user champion (step 7 and 6).		■				
Train the test group (step 8).		■				
Store the solution strategically (step 9).		■				
Implement the Pilot		1	2	3	4	5
End-users begin using the solution. Gather KPI data throughout. Provide ongoing, proactive support (step 10).			■	■	■	
Meet with end-user test group for a feedback session. Refine use case process if necessary.				■		
Integrate additional assets into the solution if applicable. E.g. more support materials, IIoT data points, etc.				■		
Review Results of the Pilot Test		1	2	3	4	5
Cease use of the solution.					■	
Perform KPI analysis (step 11).						■
Perform interviews and satisfaction surveys with relevant stakeholders (step 12).						■
Document lessons learned and key takeaways (step 13).						■
Move Forward		1	2	3	4	5
Present results and deployment proposal to project team and decision makers.						■

Ready To Start Your MR Pilot?

Equipped with these tips for running successful MR pilot programs, your enterprise is already one step closer to augmenting industrial operations, saving travel costs, better leveraging experts, and becoming an industry leader.

Need A Hand?

Stuck on any of the steps above or need help getting started? We've helped industrial enterprises successfully launch remote support solution pilots and deployments that leverage a proprietary MR technology. Contact one of our solution implementation specialists today.

Hello@kognitivspark.com

+1-877-374-6818

www.kognitivspark.com