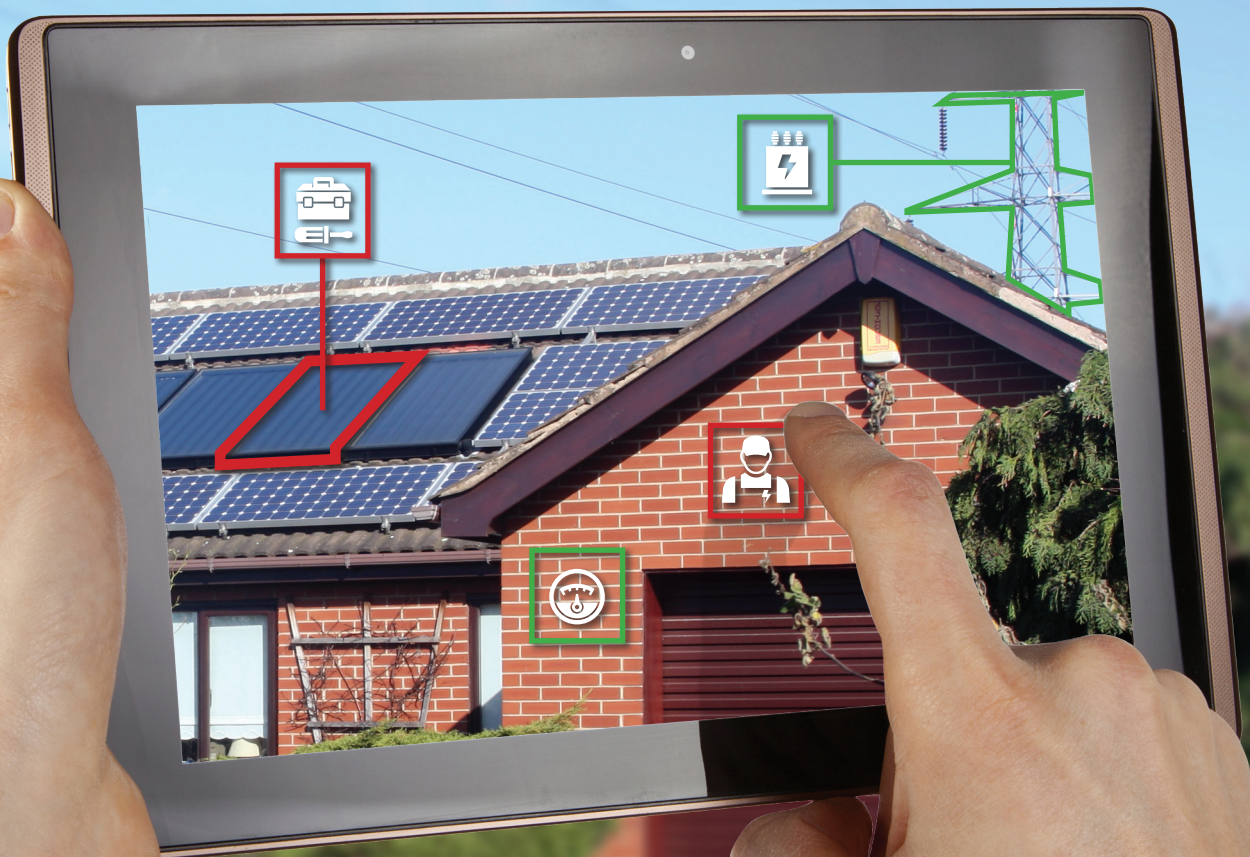




Realizing Augmented Reality for Utilities:

The Role of Mobile Devices



EXECUTIVE SUMMARY

The idea of augmented reality (AR) suggests bulky headsets and the distant future, but utilities can find benefits from AR today and leverage devices already available. The shift toward digitalization within utilities—influenced by grid modernization and an evermore digitally proficient workforce—enables utilities to leverage new technologies like never before. What are utilities thinking about AR and its potential for their organizations? What is the role that mobile devices such as smartphones and rugged devices play in realizing AR? How can utilities get started with AR in their organizations?

To learn more about AR and the role of mobile devices, Zpryme surveyed 150 primarily North American utilities. Utilities understand AR is important for them and can significantly impact the mobile workforce, but there is still uncertainty regarding how to go about leveraging its benefits.

KEY FINDINGS

Mobile devices will play a key role in bringing AR to utilities. Key findings from our research include:

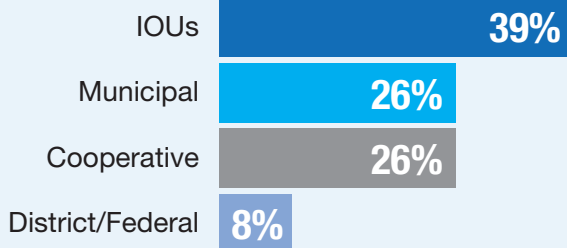
Overall, utilities expect the importance of AR for **the mobile workforce to increase over the next 3 to 5 years** (81%).

Utilities expect **tablets** (68%), **smartphones** (61%), and **rugged tablets** (57%) to be **the most significant mobile devices in implementing AR** in their organizations.

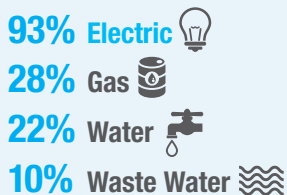
Currently, **most utilities use mobile devices and AR primarily for Geographic Information System (GIS) asset locating** (42%), but other opportunities will grow in the next few years.

RESPONDENT DEMOGRAPHICS

UTILITY TYPE



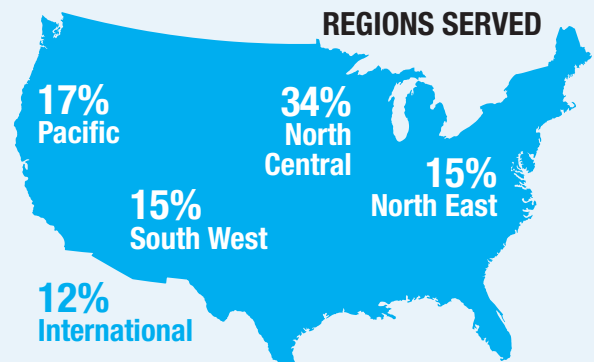
SERVICES PROVIDED



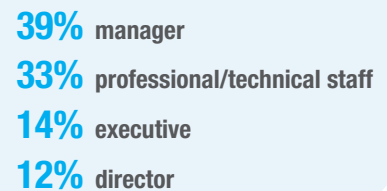
ANNUAL REVENUE



REGIONS SERVED



JOB RESPONSIBILITY



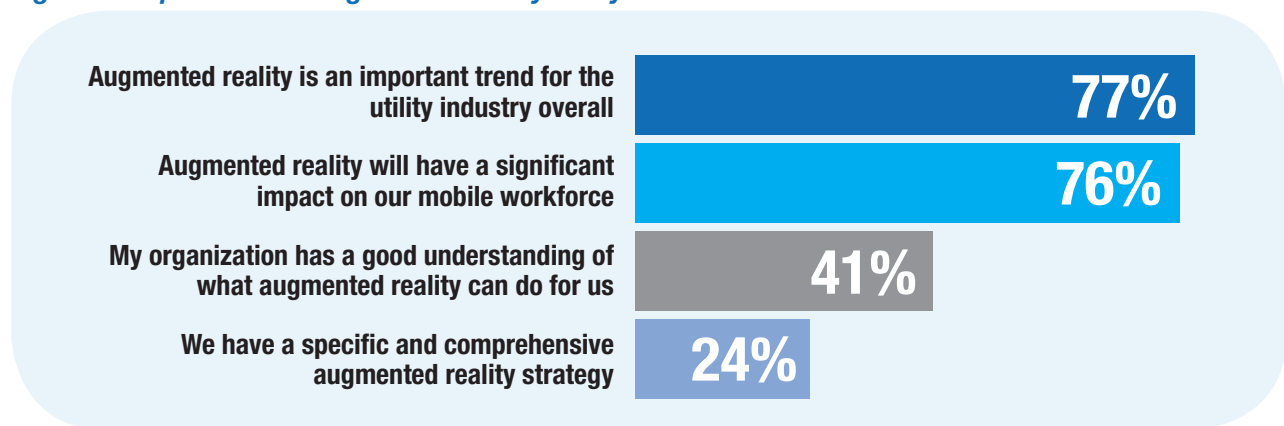
TODAY'S AUGMENTED REALITY: COMPELLING TECHNOLOGY FOR UTILITIES

We most often experience augmented reality (AR) today for leisure activities such as interactive gaming and television—but it is becoming much more than that. AR is already being used by many industries, and utilities are no exception.

Utilities are starting to understand the variety of uses AR can have within their organizations, primarily for the mobile workforce. For example, AR can connect asset locations with mobile workers to give them new insights. It can help reduce maintenance costs, make operations safer, and improve first-call resolution rates. And AR can be deployed using mobile devices already available to utilities, such as smartphones, tablets, and rugged laptops.

With the grid transformation under way, now is the ideal time for utilities to look at digital technologies such as AR to help solve problems and create new business possibilities. According to 77% of our survey respondents, AR is an important trend for the utility industry. Furthermore, 75% say it will have a significant impact on their mobile workforce. Still, less than half have a good understanding of what it can actually do for the mobile workforce (41%), and just 24% of survey respondents claim to have a specific and comprehensive AR strategy for the mobile workforce (Figure 1).

Figure 1: Importance of augmented reality today



Utilities are still figuring out the details regarding how to use AR in the mobile workforce, but they believe it will become increasingly important for their operations. Over the next 3 to 5 years, 81% of utilities expect the importance of AR for the mobile workforce to increase (Figure 2).

Right now, the utility industry is nearly split between those who are prepared for AR and those who are not. Exactly half of our survey respondents (50%) said they feel unprepared for their mobile workforce infrastructure to support an augmented reality environment. Of those who felt more prepared, only 4% feel very prepared (Figure 3).

Figure 2: Importance of AR for mobile workers over next 3 to 5 years

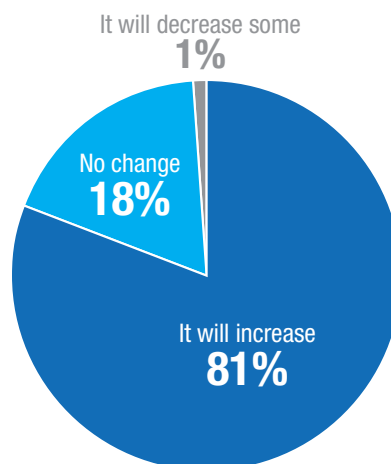
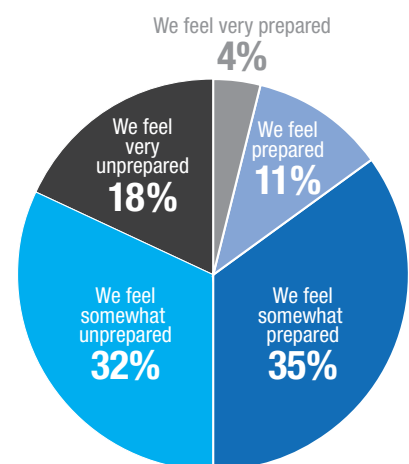


Figure 3: Mobile workforce infrastructure preparedness for AR

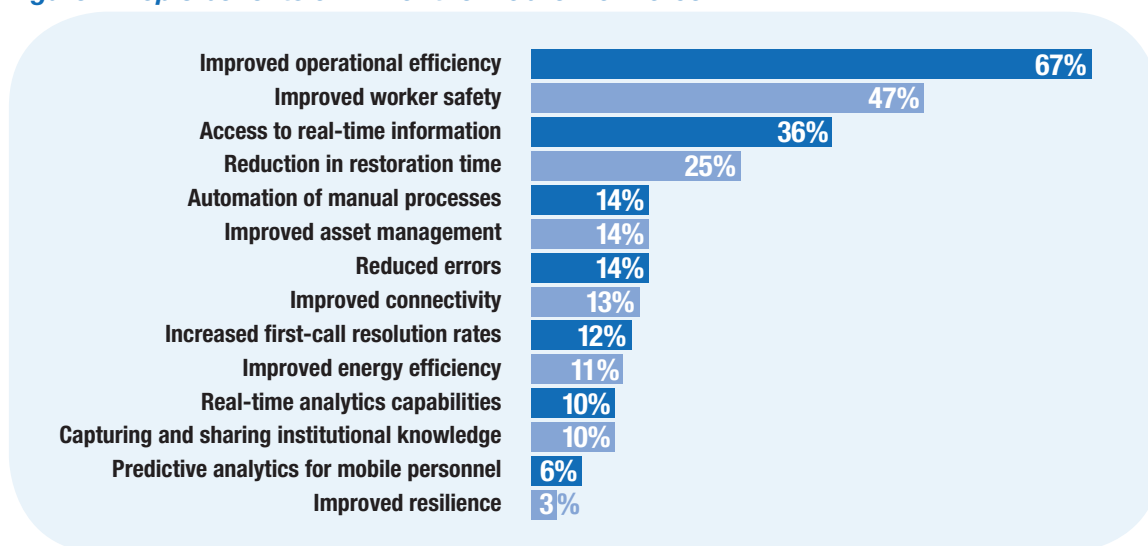


AR FOR INCREASED OPERATIONAL EFFICIENCY

The reasons behind utilities' interest in AR include many of the ones we see with other digital technologies—improved operational efficiency (67%), improved worker safety (47%), and access to real-time information (36%) (Figure 4). These benefits not only improve utilities' internal operations but bring along customer benefits as well with reductions in restoration times and first-call resolutions.

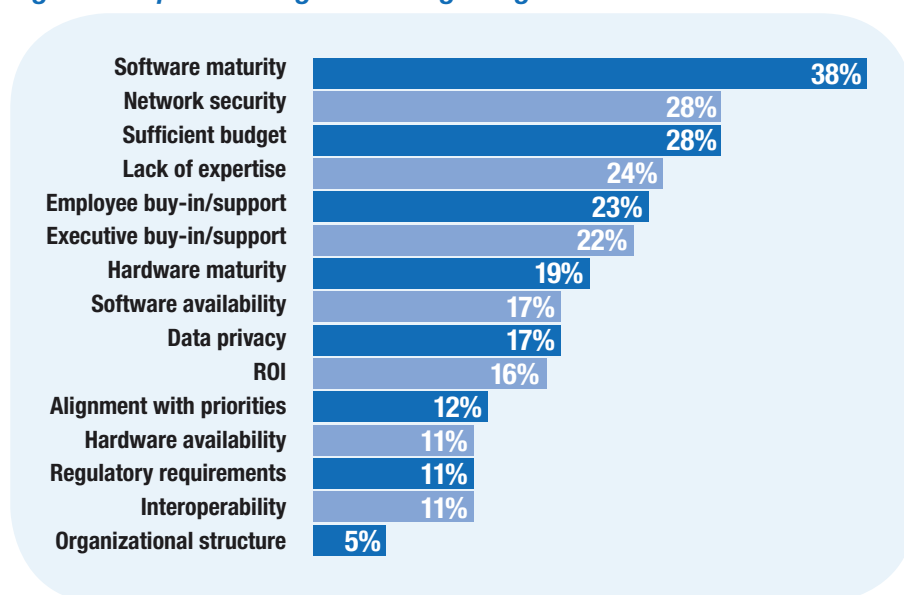
For example, today's mobile workforce already relies on numerous real-time data sources to effectively do their jobs. As more aspects of the grid transform into digital devices and assets, even more data will become available to workers. AR can help mobile workers understand data faster and more effectively, creating multiple opportunities for business process and service improvements.

Figure 4: Top 3 benefits of AR for the mobile workforce



Even with the benefits of AR, there are a variety of challenges associated with integrating AR into the mobile workforce. Although budget concerns usually top the list of challenges for new technologies, utilities are most concerned right now with software maturity (38%). Network security (28%), sufficient budget (28%), and lack of expertise (24%) are other common challenges. Utilities also face significant challenges from skeptics of the technology as a business solution. Employee (23%) and executive buy-in (22%) play key roles in successfully implementing a technology that will be used every day by employees (Figure 5).

Figure 5: Top 3 challenges for integrating AR into mobile workforce

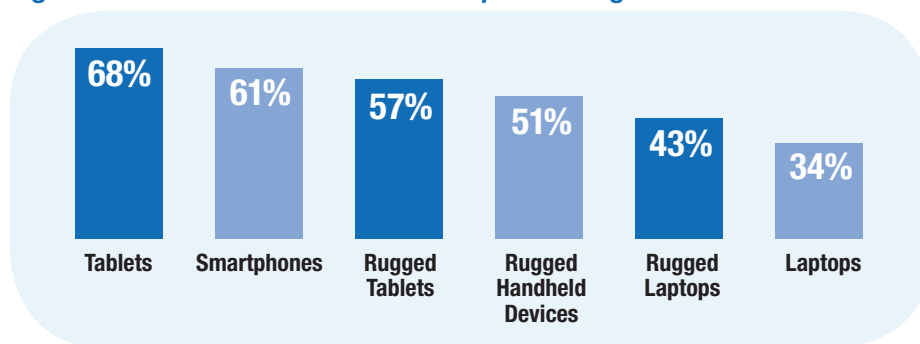


THE MOBILE DEVICE PARTNERSHIP

Mobile devices play a key role in allowing utilities to support an AR environment for their mobile workforce. Many mobile workforce employees already use devices like smartphones, tablets, laptops, rugged laptops, and rugged tablets. Utilities are making the connection between mobile devices and AR—91% of survey respondents agree the use of mobile devices for AR will be critical to the success of their mobile workforce.

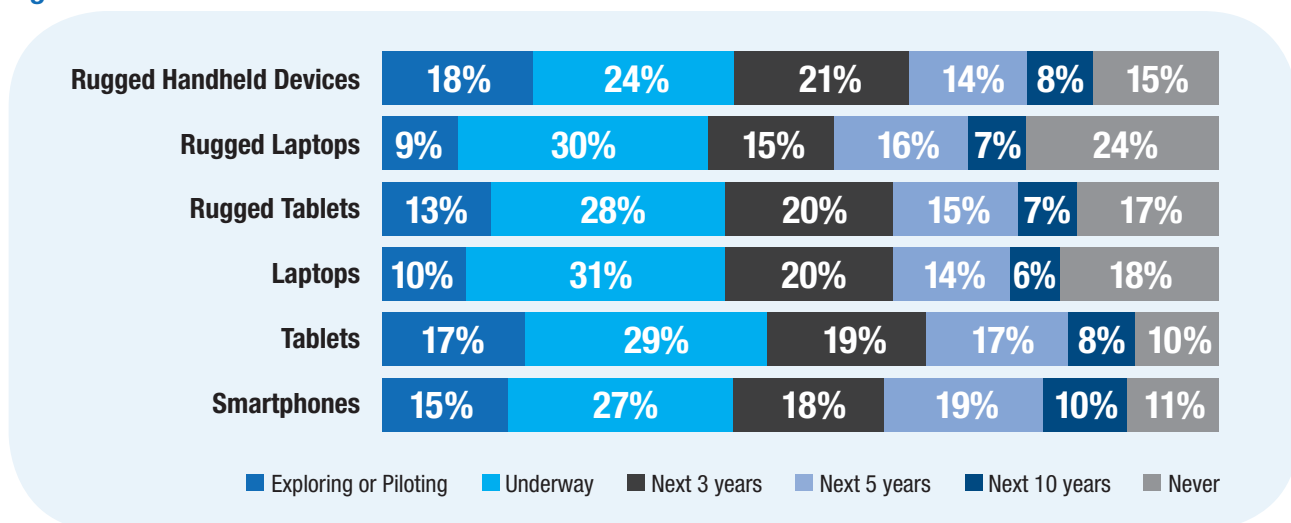
What role will various mobile devices play for AR? Our respondents expect that tablets (68%), smartphones (61%), and rugged tablets (57%) will play the greatest role in implementing AR (Figure 6).

Figure 6: Role of mobile devices in implementing AR



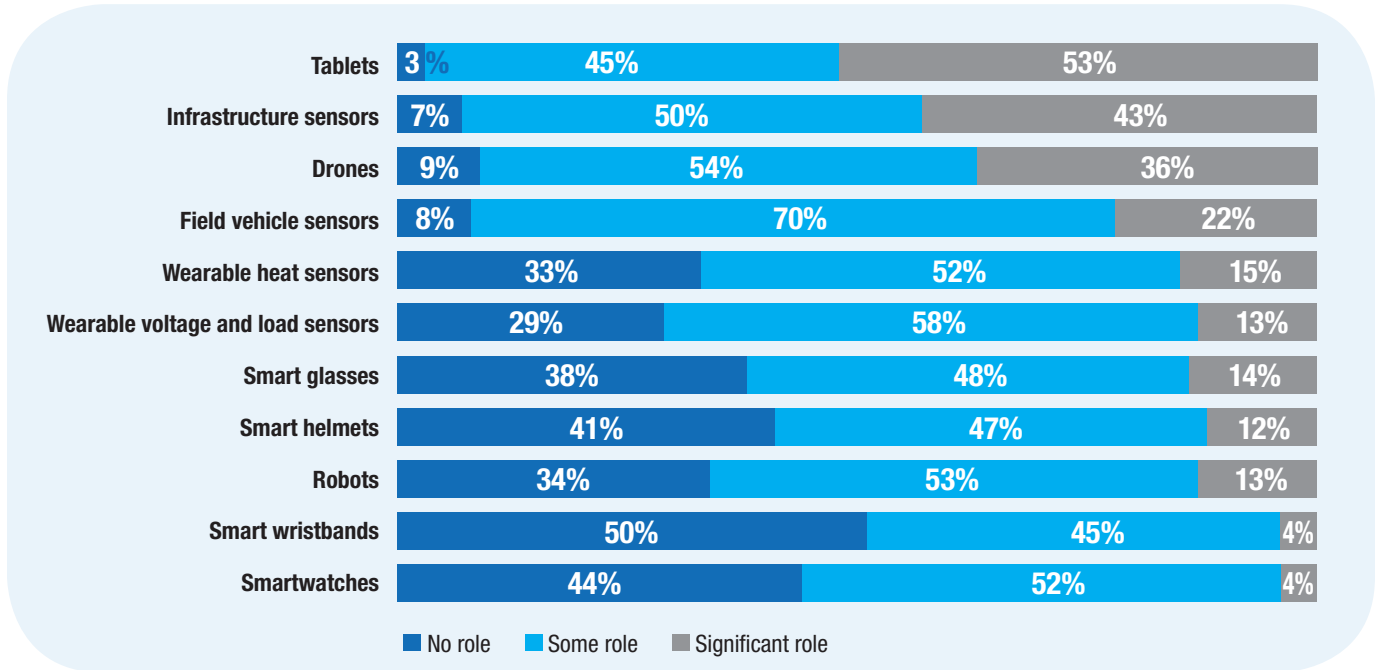
Utilities are already using laptops (31%) to support AR. Utilities also currently run AR on tablets (29%) and smart phones (27%). Interestingly, during the next 3 to 5 years, smartphones will become increasingly important for AR (37%), followed closely by tablets (36%) and rugged tablets (35%) (Figure 7).

Figure 7: Use status of mobile devices for AR



Other components of the AR ecosystem also play an important role. Our survey respondents expect infrastructure sensors (93%), vehicle sensors (92%), and drones (90%) will be used to support AR. At this point, wearables such as smart wristbands and smartwatches play less of a role for utility applications (Figure 8).

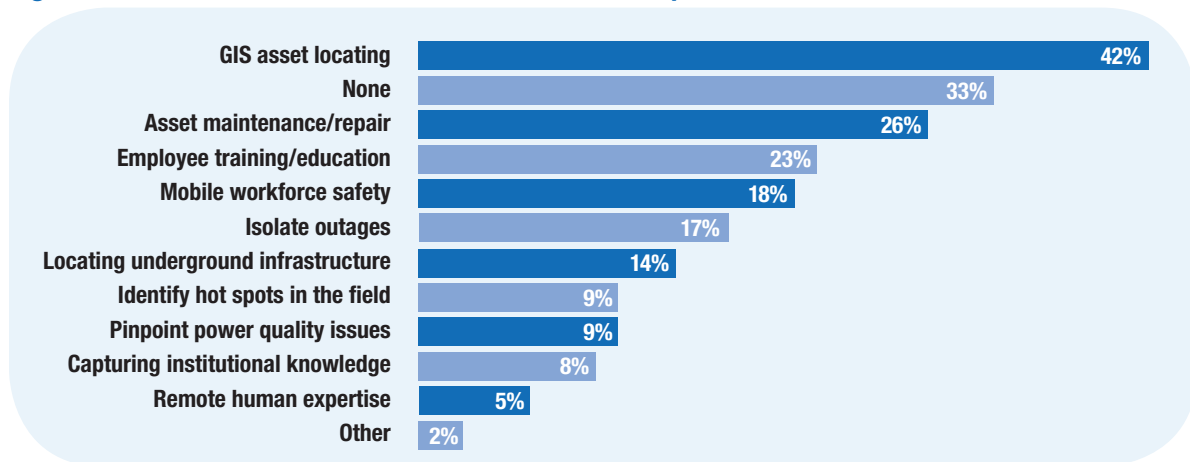
Figure 8: Role of technologies in implementing AR



AUGMENTED REALITY IN ACTION

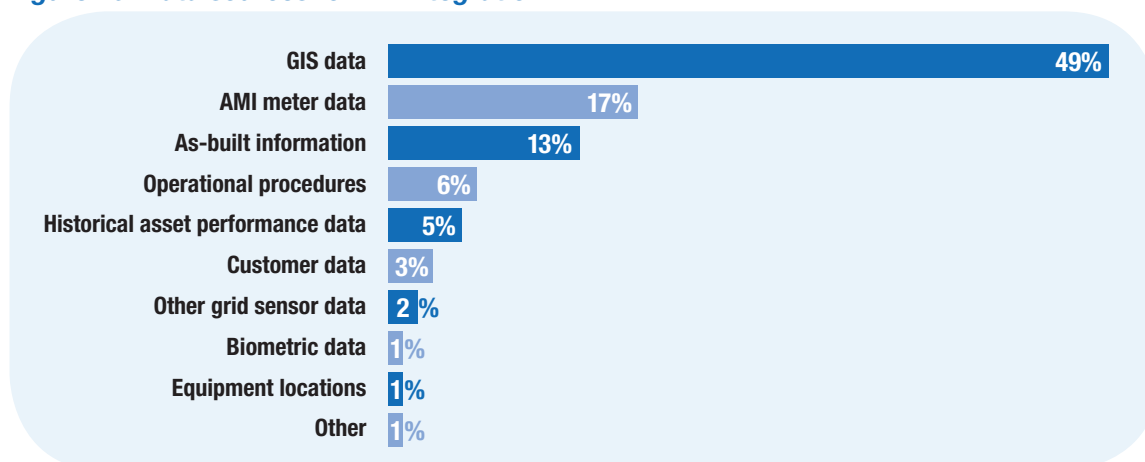
Utilities are pioneering new ways to deliver more services to customers than ever before. The shift toward a distributed, digital grid makes the job of the mobile worker more complex than ever before. Some utilities are already helping mobile workers adapt by taking advantage of the mobile devices they already use to deploy AR. GIS asset locating is currently the leading operational use for AR (42%), followed by asset maintenance and repair (26%) and employee training and education (23%) (Figure 9).

Figure 9: Current use of mobile devices and AR for operations



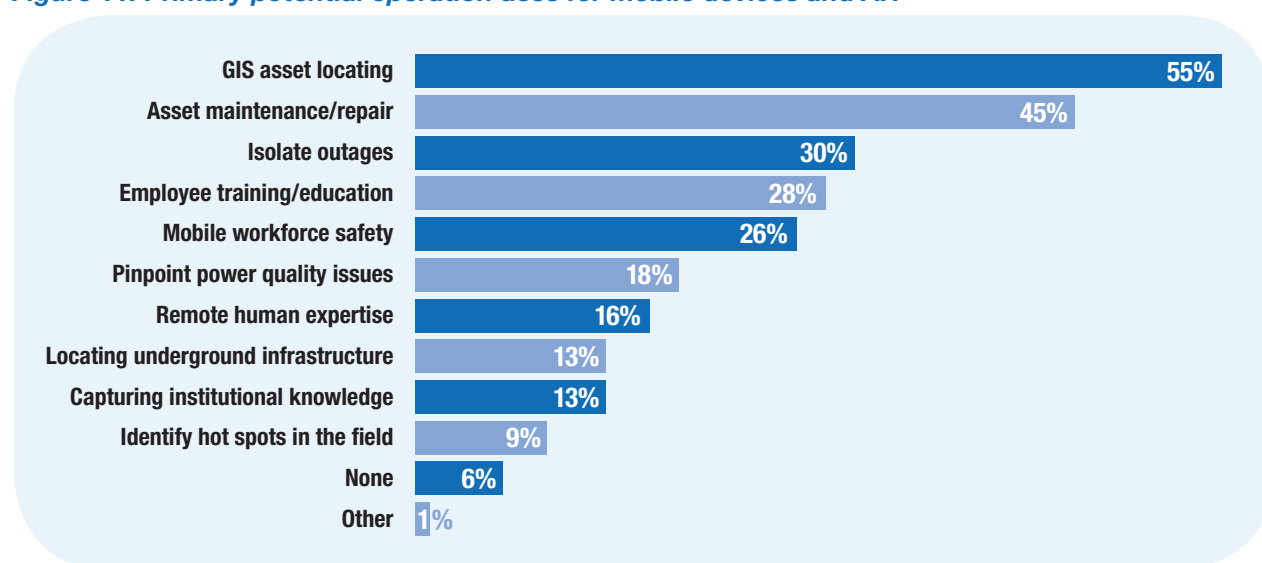
Given the importance of GIS asset location, it makes sense that our respondents identified GIS data (49%) as the most important for AR integration. GIS data has a variety of uses within the mobile workforce, such as locating and monitoring assets, identifying outages, and locating and tracking mobile workforce teams. Combining GIS data with AR capabilities, utility workers can do things like digitally timestamp the most recent maintenance request for an asset on the grid. This would improve operational efficiency by eliminating manual data entry and improve worker safety by minimizing physical contact with complicated assets. Other data for AR include AMI meter data (17%) and as-built information (13%) (Figure 10).

Figure 10: Data sources for AR integration



Looking ahead, utilities still expect GIS asset locating to be the most common use case for mobile devices and AR (55%). However, as a useful technology, the potential of AR is extensive and diverse. Asset maintenance/repair (45%) and employee training/education (28%) are expected to continue to be top use cases, but other uses like isolating outages (30%) and improving mobile workforce safety (26%) will become increasingly important (Figure 11).

Figure 11: Primary potential operation uses for mobile devices and AR



RECOMMENDATIONS: HOW TO START DOWN THE AR PATH

In an industry that can't always rapidly implement new technology, utilities can still begin planning to take advantage of AR now. Many mobile workforces already possess the mobile devices that are critical for supporting AR. So, what's the best way for utilities to move forward? Here are a few suggestions:

PRIORITIZE USE CASES.

The first step for bringing AR into your organization is to identify and prioritize the most critical use cases. Consider the most important benefit you want to achieve. Operational efficiency? Employee training?

LEVERAGE EXISTING MOBILE DEVICES.

Consider the devices that already exist in your organization. Are they capable of supporting AR? Tablets, smartphones, and rugged tablets are good prospects for pairing with AR technology.

TAKE ADVANTAGE OF A YOUNG WORKFORCE.

Today's younger workers are more digitally inclined than previous generations. As more of these workers move into the workforce, take advantage of their technology skills. A mobile workforce already proficient with mobile devices will ease some of the challenges of employee training and education.

AR is still young in its use for utilities. Now is the time to start strategizing and planning for how to implement and maximize the AR environment.



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