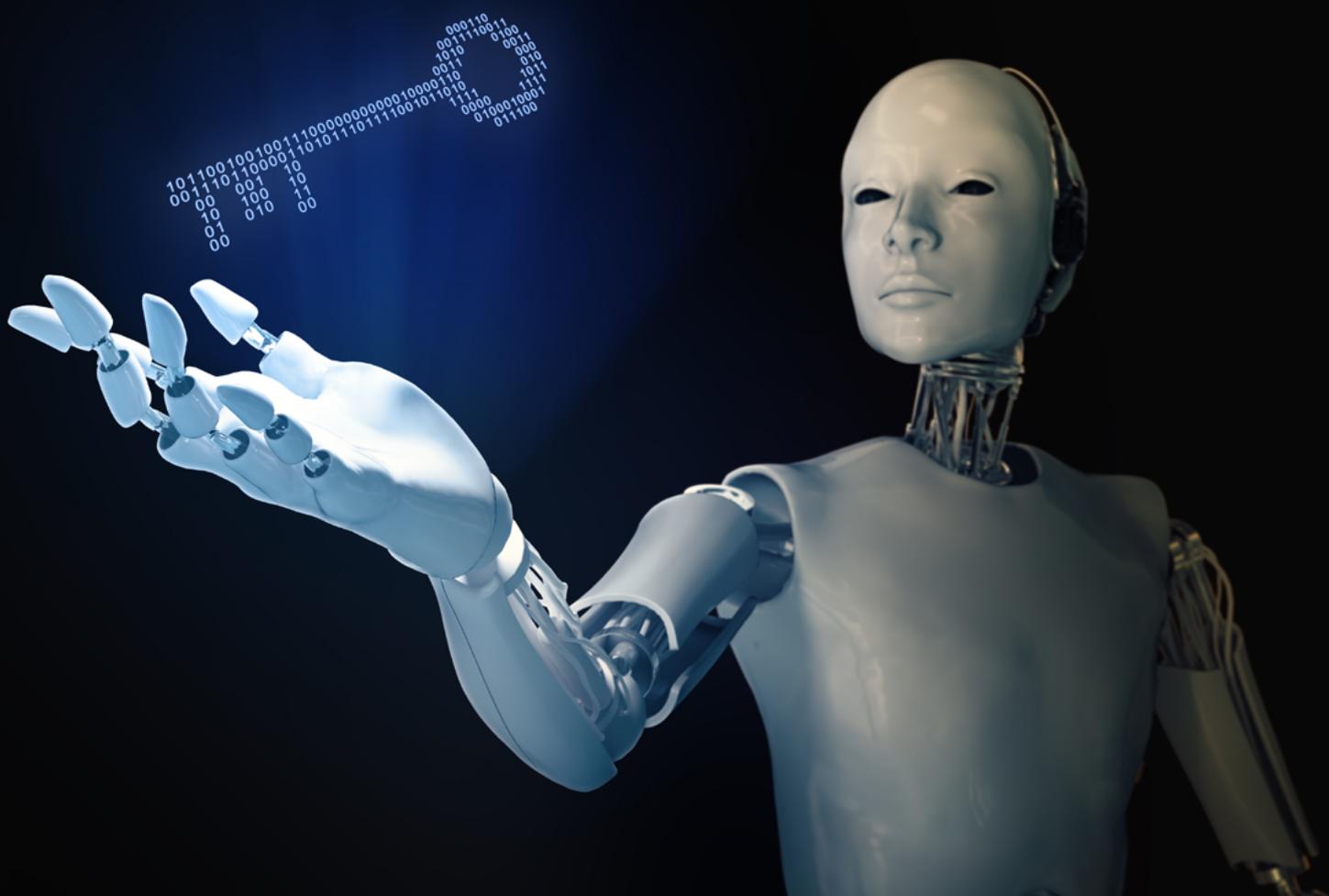


Augmented Reality in Service: Ready for Prime Time?

Management Report 2018



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This is the first report in our “Technology in Service” series.

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Preface

Converging advances in Machine Learning algorithms, sensing, connectivity, and computing capacity in the Cloud combined with imploding costs are driving the digitization phenomenon at rapid, and possibly increasing speed. The Internet of Things, Industry 4.0, Big Data and, more recently, AI have become hot constant topics of business conversation and hold the promise of massive improvements in productivity and wonderful new product and service offerings. Already the economics of major industries are being upended and business models disrupted -on an almost continuous basis.

As digitization becomes increasingly pervasive, its impact on business, industry, jobs, politics, society, even geopolitics, becomes hard to analyze, let alone estimate or predict quantitatively. Nevertheless, in a report titled “The Internet of Things: Mapping the Value Beyond the Hype” from 2015, McKinsey & Co., a consultancy, did estimate that the IoT’s potential value to manufacturing, from operations and equipment optimization alone, lies between US\$ 1.2 and 3.7 trillion. Such estimates are probably already obsolete, as even more powerful technology is developed and deployed. However, they do point to a starting point and illustrate the order of magnitude of change underway.



As we can already see today, digitization will also fundamentally change the industrial/technical service business: Smart Connected Products will diagnose problems themselves or be diagnosed remotely; Maintenance will become increasingly, almost exclusively, predictive -driven by AI; Spare parts will be 3D printed; Needed interventions and optimizations at any level will be carried out according to AI generated instructions; And humans will interact at a deeper level with machines through Augmented Reality, whether the machine is in the same room or on the other side of the planet. The nature of the service business will shift from labor and logistics to knowledge management and exchange; Customers will become more self-sufficient; The nature of competition and business models will change, as *servitization*, in the sense of product-as-a-service (PaaS), is enabled by digitization; And platforms will become ubiquitous. The implications for jobs, companies, growth, and profits will be vast.

At Si2 Partners we are playing an active role, both in observing and analyzing digital change, as well as in shaping it, by helping companies navigate the technology maze, but foremost by helping in the structuring of new strategies, models, offerings, and operations adapted to what is now required. As part of this endeavor, which we call “**Digital Servitization**”, we are bringing out a new set of annual management reports on relevant technologies, based on surveys, that will attempt to shine a spotlight on how service companies and businesses are introducing and using (or not) new technologies and how they are managing digital change. We use the survey results to draw lessons and develop insights on challenges and solutions, best practices and the right ways forward.

Our first Management Report – “Augmented Reality in Service: Ready for Prime Time?” in the Technology in Service series is available as of June 2018.

Survey Highlights

WHO AND WHAT

- ✔ Augmented Reality (AR) is very new to most service companies and businesses, but the trend to introduce the technology is accelerating.
- ✔ Less than 1/3 of participants say they use AR in their business today, and of those, 53% introduced AR only within the past 12 months. But 1/3 of non-users say they will implement AR within the next 12 months.
- ✔ Remote, virtual support by an experienced human, whether of own field personnel or directly of customers is the dominant use mode of AR today. Smartphones and tablets are the preferred devices, though a few use exclusively Smartglasses.
- ✔ But some participants are piloting digital content (e.g. use of 3D models for instructions or simulations) and integration with real-time machine data through the Internet of Things to provide context to engineers.
- ✔ And the majority plan to integrate AR with Service Management, Knowledge Management Systems and the IoT in the near or medium term.

WHY

- ✔ Most companies take AR introduction decisions based on productivity and cost considerations. Most expect to save on scarce engineering resources and provide better service (faster response times, lower MTTRs, improved FTF rates) to customers. Some are creating AR-based offerings and have expectations of additional or different revenue streams.
- ✔ AR projects are mainly initiated by line managers rather than digitization experts. It seems that the potential benefits of AR, at the intersection of operational and information technology, are more evident to people directly involved with operations.

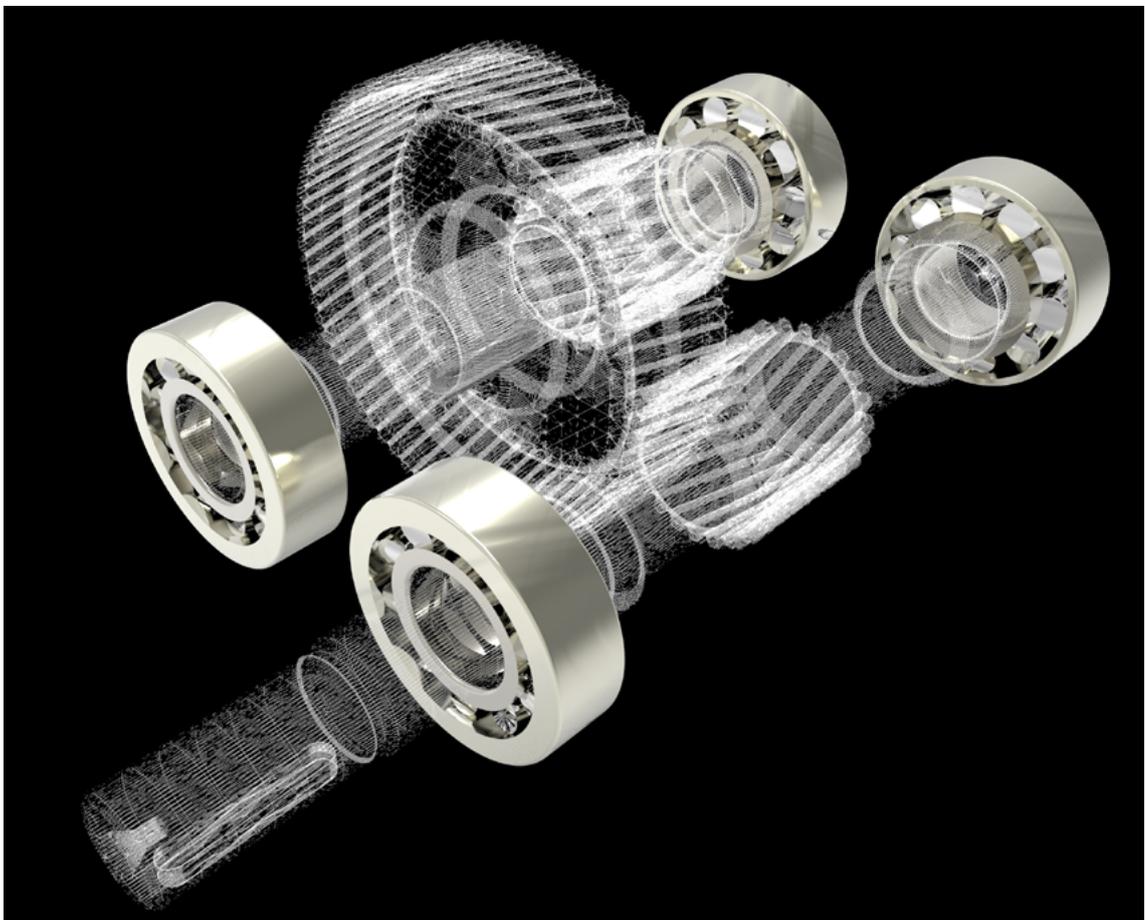
CHALLENGES

- ✔ Selected AR system features, applications, and use modes are not always fit for purpose: One size does not fit all. This leads to lower levels of acceptance and demotivation and can jeopardize the achievement of objectives.

- ✔ Lacking connectivity at customer sites appears to be a significant problem in AR service applications, where users are obliged to rely on third party or public networks.
- ✔ Planning and preparation for AR do not seem to be extensive for the most part; use cases are not methodically researched or developed, and progress followed up, in terms of improvements, is not systematic or consistent. Many companies seem to have underestimated both the effort required and the changes necessary to see real results with AR.
- ✔ Consequently, satisfaction and acceptance leave room for improvement. Interestingly, customers demonstrate a higher acceptance of AR activities of service vendors than their own personnel. This is not surprising, as, in the end, customers will be the main beneficiaries of AR applications.

THE PROMISE

- ✔ Though managements don't (yet) systematically track operational improvements directly attributable to AR, most say that AR is indeed already making a difference, particularly in speeding up interventions (MTTR) and reducing travel requirements. The majority, 72%, say that results are on par or above expectations, 12% say results are mixed, and 16% that it's too early to tell.

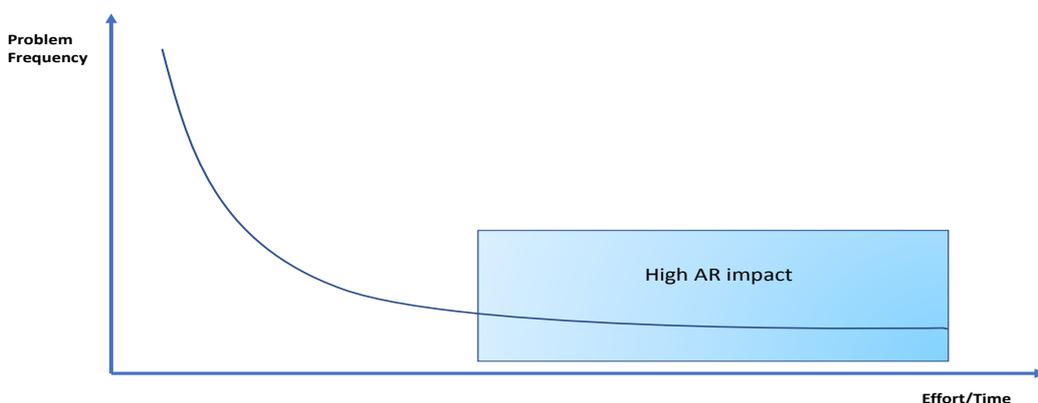


Analysis Summary

The survey, the first in the intended series, had a moderately-sized sample and therefore cannot be considered “representative” in a rigorous sense. However, it did bring forth some expected and some less expected results.

For example, it was expected that the first and most widespread use of AR in service would be remote support of field engineers through “central experts”. This is considered the fastest and least expensive way of introducing AR, and one that can have a significant economic impact from the start. Many AR vendors strongly promote it. But, as it turns out, and was less expected, this use mode is suitable for some, but not other companies. Particularly companies that build complex machinery and require highly qualified and experienced engineers for service support do not seem to derive great value from the application. It is not clear, for example, what, if any, additional contribution can be given to the engineer that cannot be provided through conventional means, like video calls. On the other hand, for experts trying to diagnose and rectify difficult problems, “context” in the form of real-time machine data or equipment history displayed in the engineer’s field of view can make a significant difference, as can support from product or system specialists, who may be distributed in different departments or locations. Such applications are, however, still few, as they are technologically more challenging and require more effort and investment to implement. Other interesting results were the high acceptance rate of direct AR-based support by customers or indicated productivity increases by companies with large field service operations supporting standard products or installations and relatively less qualified technicians. In the former case, customers are the ultimate beneficiaries of AR. In the latter case, AR seems to help particularly with “long tail” problems, those that arise infrequently but cause the most trouble and effort to fix.

AR can have significant impact on infrequent problems which require disproportional effort



Undoubtedly there has been some naïveté on the part of many companies implementing AR, regarding potential challenges and required effort to get results, both of which may have been underestimated. This is mainly due to the hype surrounding the technology, in both business and consumer markets. Challenges may be technical (e.g. lack of connectivity, problematic system performance or bugs), managerial (lack of acceptance, failure to implement right processes, manage change or monitor progress) or both. The key issue however, is that many companies fail to see the big picture with AR, its coming role as a “user interface” at the intersection of the virtual and physical worlds and its power in helping people visualize and absorb information and enhance knowledge creation (-much like the internet served to organize information in the 1990s). For this to happen information must be digitized (in the case of service, mainly about machines) in ways that can be effectively visually rendered and easily accessed or provided. Early AR adopters, mainly large companies, are already investing and experimenting with this.

For service managers six lessons drawn from the survey are particularly important:

- ✔ AR can produce operational improvements and cost reductions rapidly and sustainably if the right use modes are chosen and the process effectively managed. It can simultaneously free up scarce engineering resources, expand effective capacity and contribute to better customer satisfaction.
- ✔ It seems however, to often fall under the radar of “digitization departments”, which are possibly understaffed in many organizations or occupied with non-service related work. Service managers have therefore been successful in taking themselves the initiative and being proactive about AR.
- ✔ Use modes and applications must be chosen carefully with a view to short-term impact and long-term competitiveness. One-size-fits-all does not work and the particular circumstances of the business (customers, people, products, pain points) are very important.
- ✔ Service managers should not hesitate to involve customers early in direct AR based support, even in pilots and trials. Customers are the ultimate beneficiaries of AR and digitization and they will be co-designing the way forward.
- ✔ Service managers need to be careful with AR vendor and system selection. While most systems derive key functionalities from widely available SDKs (Software Development Kits), they differ in features, operability, and ability to integrate, as well as in other services provided.
- ✔ Finally, introduction and implementation of AR needs to be carefully prepared, planned, managed, and monitored. Usage ideas need to be systematically researched and tried; People motivated and encouraged to use the system; And progress closely followed.