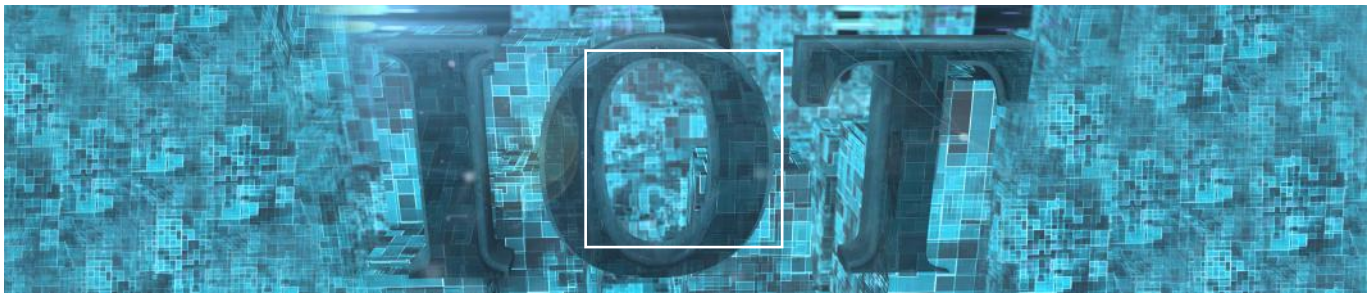
Arthur D Little

Event Summary

A maturing Internet of Things

Realizing the next level of value

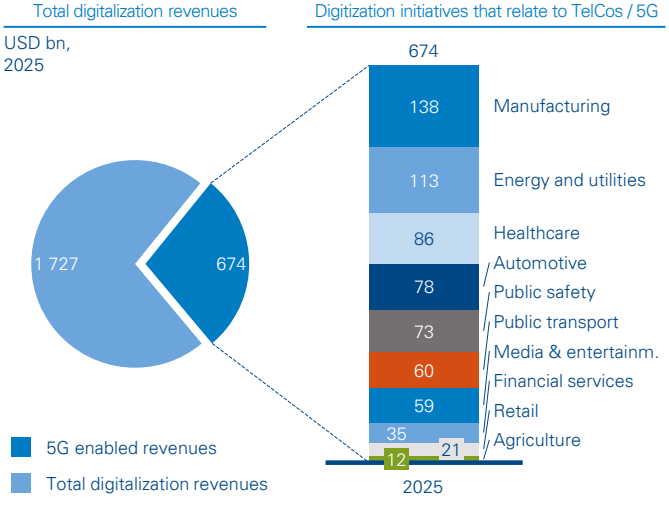


On September 28th, 2018, Arthur D. Little hosted its annual executive event on the state of the Internet of Things in Munich. It was attended by more than 50 senior executives from different industries in Europe, the Middle East, Asia-Pacific, and the US, and this year's theme was "A maturing Internet of Things – Realizing the next level of value". Insightful presentations from analysts and industry leaders, breakout sessions, and lively discussions allowed all participants to gain valuable perspectives on, and ideas about, how the combination of 5G and the Internet of Things could generate future revenues for telecom operators, manufacturers and solution providers – and what prerequisites for technology, standards and business models are needed to succeed. To wrap up the conference, the event concluded at the Munich Oktoberfest, where many participants networked in a relaxing atmosphere.

The IoT: After the hype is before the next big thing

Over the past years the Internet of Things (IoT) has evolved from early machine-to-machine communication to synonymous with digital transformation. With the rise of the IoT, key enablers for value creation have been identified. In the initial phase, these drivers were connectivity (instantly available, across borders and with high bandwidth) and a partnership ecosystem.

Figure 1: Digitization opportunity (Arthur D. Little, 2018)



Source: Arthur D. Little

With connectivity becoming almost ubiquitous, platforms have been the second main enabler for the IoT. And while IoT platforms have significantly evolved over the past years, value creation and differentiation in the future will not be possible solely based on high-bandwidth, extensive partnerships and a technology platform. But new drivers for value creation in the IoT are emerging.

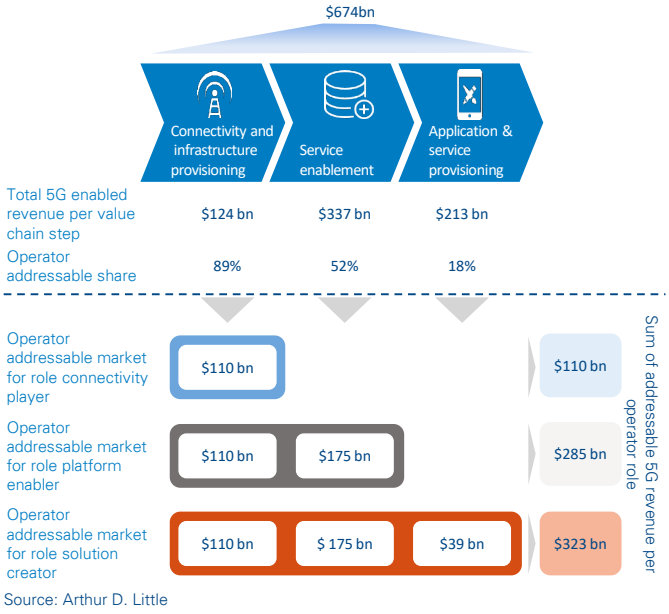
Throughout the executive event, the presentations, discussions and breakout sessions gave participants from enterprises and telecom operators valuable insight into where and how the IoT would create the next level of value.

5G and the IoT: A perfect match that both creates value and drives adoption

5G is the next major leap in connectivity and for the Internet. For ongoing digitization, 5G is a key driver. As highlighted in a recent study by Arthur D. Little, the total global market for digitalization and IoT revenues is expected to reach 2,398 bn USD by 2025. Therefore, telecom operators have the opportunity to address a major share of 674bn USD (Figure 1) by leveraging 5G across the main verticals. To address this market, the study suggests telecom operators follow one of three plays: pure connectivity play, becoming a platform enabler, or becoming a solution creator (Figure 2).

Figure 2: Addressable market and play for telecom operators

Total 5G enabled revenue (2025)



Source: Arthur D. Little

Manufacturers and operators such as BMW and Vodafone see 5G as the enabler of big leaps in technologies such as AI, smart cities and advanced manufacturing. All of these are closely linked to the Internet of Things. Stephan Klink, Head of Commercial Expansion and Enablement at Vodafone Group Enterprise IoT, expects that "90 percent of the 5G opportunity is for IoT". He suggested that 5G would create further value for the IoT in three areas:

1. **Critical applications** that will only work with 5G (e.g., mobile virtual reality in healthcare)
2. **Enhanced applications** which benefit from technical evolution to improve the experience (e.g., video streaming)
3. **Migration of applications** in which a futureproof solution is adopted (e.g., smart meters) with 5G and the IoT

And while autonomous driving is often cited as one of the main use cases for 5G, Julian Geiger from BMW highlighted that some market leaders such as Waymo do explicitly not bank on it for the first generation of autonomous vehicles. However, 5G will likely be key to connected autonomous vehicles, which will finally unlock the full potential of autonomous driving and lead to truly world-changing benefits. With connected vehicles that broadcast their status, collaborate within the fleet on sensing, cooperate on driving maneuvers and synchronize and self-organize their driving, manifold advantages are foreseeable. Most notably, the discussed vision highlighted:

- Zero traffic jams
- Zero road accidents
- Zero waiting times
- Minimal emissions

Both presentations and the discussion round showed that 5G creates the opportunity for new – high-value – use cases that promise new value generation with the IoT, in both B2B (e.g., mission-critical applications) and B2C (e.g., connected autonomous vehicles). Yet, a major barrier to the 5G breakthrough is high investment costs. Karim Taga, Global Head of Arthur D. Little's TIME[1] practice, emphasized that with today's use cases it is challenging to justify premium prices on 5G services, and that the investment in the network cannot be managed solely by operators. He stated that an ecosystem effort with the joined forces of industry, operators and regulators was needed. The discussion emphasized that if telecom operators remained the "dumb pipe," they would not create the return that would justify wide-scale investment in 5G technology. In summary, the IoT and 5G can be a perfect match where new, high-value use cases create further value for the IoT while allowing for business models and products that create the necessary return to invest in 5G technology.

Standards and the IoT: Supporting an IoT-first world

"It is an IoT-first world and we are living digital transformation," Renaud di Francesco from Sony explained. He highlighted that it was not so much about IT, but about real-world technology and people (RWTP). In order to create massive value with RWTP (and the IoT), the cross-roads of human, cyber-physical and digital needs to be further managed.

Herein, standards can be a key lever to ensure that technologies on the edge and core, machine-type communication and evolving use cases create sustainable value. In the past, many siloed initiatives have emerged and been successful (e.g., the German Industry 4.0 specification). Standards can be the vehicle to unlock value and expand on a global scale, as well as across business domains. To form and evaluate standards Sony has developed its rationale on three pillars (interoperability, procurement, ecosystem), with clearly defined drivers; with this approach, the "not invented here syndrome", one of the main obstacles to establishing standards, can be overcome.

Throughout the discussion, the potential of the oneM2M reference architecture was highlighted. Following the logic of established standardization approaches such as 3GPP, oneM2M intends to establish a reference for a common service layer that ensures interoperability – independent of location, technology used and business domains. In addition to the wide

1 Telecommunication, Information technology, Media & Entertainment

interoperability, a common service layer allows for different business domains to share common services (e.g., things representation, semantics) and network infrastructure.

However, the discussion also highlighted that to date, no dominant IoT standard had emerged and players in the IoT ecosystem would need to remain aware of the developments. Following a well-established standard will always create trust: in the solution, the service and the future relevance.

Data and the IoT: Value is in the data and the process

Another driver for the next level of value in the IoT that was discussed was data. Christof Hellmis presented the view of HERE Technologies that the "IoT is about the data and what you can do with it". And the vision of HERE Technologies is an autonomous world where not only is autonomous driving enabled, but supply chains, infrastructure and many more aspects of the analogue world are digitally represented and management and consumption are dynamically optimized. For this, the company is working towards an index of reality. Christof Hellmis raises awareness that the technology to create, process and store data is only of secondary nature, which means not every data point that can be gathered with technology must be – but when building a digital index of reality, first and foremost the business case for a data point needs to be evaluated.

Throughout the discussion participants shared their own experiences of building an index of reality – more prominently known as a *digital twin*. The overall agreement was that the development of a digital twin would never be finished, but would need to be updated continuously: with more (heterogeneous) data sources, different analytical models and unlimited use cases. Based on a case study from the logistics industry, HERE Technologies showed that by developing and monitoring the digital twin of a shipment process, inefficiencies could be significantly reduced.

Besides the use of data to improve processes, another intensively discussed topic on data and the IoT was monetization of IoT data in a B2B and B2C context. For Sony, before commercially monetizing the data, ownership rights and roles, as well as their relevant mechanisms, need to be established. For this, Mr. Di Francesco recommends to distinguish three key roles: data owner, data collector, and data user/beneficiary. Monetization then amounts to transactions on rights duly respecting ownership, as in established right markets (content rights in music, movie and audiovisual, software licensing, etc.). For example the data marketplace about to be launched by HERE technologies builds on data value.

For telecom operators this provides a multitude of opportunities as presented by Roland Haidner, CFO of A1 Digital. In line with the three (own, collect, use) possible plays for telecom operators to benefit from the IoT/digitization opportunity, A1 Digital has been specifically founded as a platform enabler and in selected industries as a solution provider for its customers (esp. Cloud and Vertical Markets). Roland Haidner explained how A1 Digital helps its customers in smoothing out the "fish model" impact (i.e. financial pressure on companies during the phase of digital transformation whilst investment in new competencies and capacities is high and legacy revenues are lost). However, Roland Haidner concluded that digital transformation is crucial to stay in business.

The discussion highlighted that telecom operators had the opportunity to leverage their existing know-how in processing data to provide services and solutions to customers that would limit the required upfront investment, as well as shorten the period of lost revenues.

Smart cities, industrial IoT and consumer IoT: What does this now mean for telecom operators?

The final session of the conference was spent in three breakout groups in which the drivers for and opportunities in the three areas of smart cities, industrial IoT and consumer IoT were further investigated:

Insight into smart cities

Karim Taga of Arthur D. Little opened the session with a presentation of Arthur D. Little's latest report on smart cities, forecasting a 16.5 percent average market-growth rate for smart city services/products in the next five years. Considering it is an attractive market, the session focused on identification of the relevant success factors for smart-city projects. Ernst Luckner of Swarco Futurit emphasized the dilemma that while municipalities benefited the most from the IoT and smart cities, they lacked the money for investments. He recommended that to provide value for municipalities, solutions should not be focused on silos (e.g., only traffic signals), but by providing management solutions that were open for complementary functions and flexible for point-to-point connectivity, municipalities could create significant synergies in leveraging IoT solutions and thus justify investing in the smart city.

In a vivid discussion in which Arthur D. Little presented further insight from its latest smart-city projects, three success factors for smart-city projects were identified.

1. **Start small and establish KPIs:** Follow a pilot approach, but have a clear set of KPIs to build credibility and trust. This allows for early identification of governance obstacles.

2. Overcome transformation resistance: Identify (governance) sources of resistance and support at the beginning. Make one source of support your champion to drive transformation, help build credibility and a city-wide network, and overcome resistance.
3. Expand funding horizon: Develop access to non-local funding opportunities on a domestic/international (e.g., EU funding) level.

Insight into the industrial IoT

The breakout session on the industrial IoT highlighted that for enterprises, the IoT was the promise of improving operations to become disruptive and creating breakthrough business value. Moreover, in the industrial context, Julian Geiger from BMW highlighted that "compute-infused 5G networks is a means to create ageless devices". This enables the continuous delivery of new services on some long-life devices.

And while the potential of the industrial IoT for enterprises is evident, a live survey among the participants revealed highly relevant insight for telecoms:

1. The responses highlighted that service providers did not necessarily need to build in-depth vertical knowledge, but did need to be able to position a use case in a vertical context.
2. The respondents clearly confirmed that for large enterprises, system integrators were the go-to partner for industrial IoT solutions, rather than telecom operators. The reason was that SIs provided the relevant expertise and experience in the business domain – often even specialization in the form of industry-specific SIs (e.g., Schlumberger in oil & gas). Nevertheless, telecom operators have a major market opportunity with small and mid-sized enterprises. Telecoms can leverage their expertise in scaling solutions to build a solution for one company and bring it to the entire industry.
3. Today's available network technologies enable many industrial use cases. While 5G will be a great future addition, for operators it will be even more crucial to leverage their capabilities to build partnership networks and horizontal platforms.

Insight into the consumer IoT

In the third session, an intensive discussion on the relevance of telecom operators for the consumer IoT emerged. It concluded in the agreement that telecom operators had little opportunities in selling consumer IoT services, but that by "accepting to be the bit pipe", telecom operators could enable platform companies, manufacturers and, most importantly, the consumer to create everyday value with the IoT.

In addition to the positioning of operators, the session focused on the relevance and impact of newly emerging consumer IoT ecosystems by the tech all-stars (Google, Amazon, Apple, etc.). While technology companies are eager to expand their own product portfolios through M&A, independent consumer IoT companies need to put the customer at the center and focus on interoperability across multiple ecosystems and standards.

Closing at the Oktoberfest

At the invitation of Arthur D. Little, the event closed with a visit to the Munich Oktoberfest. Many participants, some even in traditional "Lederhosen", used this opportunity for further exchange of ideas and networking while enjoying a tradition far removed from digital transformation and the IoT. We are already excited to welcome you to next year's IoT event on September 27th, 2019 in Munich.

Contacts

Michael Opitz

Partner

opitz.michael@adlittle.com

Karim Taga

Partner

taga.karim@adlittle.com

Bela Virag

Partner

virag.bela@adlittle.com

Author

Sebastian Pfanner

Arthur D. Little

Arthur D. Little has been at the forefront of innovation since 1886. We are an acknowledged thought leader in linking strategy, innovation and transformation in technology-intensive and converging industries. We navigate our clients through changing business ecosystems to uncover new growth opportunities. We enable our clients to build innovation capabilities and transform their organizations.

Our consultants have strong practical industry experience combined with excellent knowledge of key trends and dynamics. ADL is present in the most important business centers around the world. We are proud to serve most of the Fortune 1000 companies, in addition to other leading firms and public sector organizations.

For further information please visit www.adlittle.com or www.adl.com.

www.adl.com/IoTevent