While the “Internet of Things” (IoT) has been touted to be a major growth opportunity for Telcos and infrastructure providers over the last 10 – 15 years, reality shows that this market seems to be more complex and less profitable for service providers than previously expected. As a result, no major Telco or infrastructure player has been able to take a significant profit pool from IoT connectivity as of today.

However, the number of connected devices seems to be increasing rapidly, fuelled mainly by consumer devices and industrial adoption.

So Telcos need to review their current strategy in order to gain more relevance in this emerging environment. New networking technologies and new business model options are available, in addition to new propositions like advanced data analytics and machine learning algorithms - providing a significant potential to enable efficiency and productivity gains across a variety of industries.

The Solon whitepaper provides insights into IoT technologies and projected developments of the low-power wide-area network connectivity compared to the traditional cellular connectivity and the respectively arising IoT connectivity opportunities for Telcos and infrastructure players.
The IoT Ecosystem

While machine-communication as such is not a novelty, the number of connected devices as well as embedded sensors has increased significantly over time due to the emergence of the Internet Protocol (IP) and hence transformed into a new category – “The Internet of Things”.

The adoption of IoT technologies and platforms today varies greatly between industries. The impact of IoT applications however, seems to be quite significant - overall revenue improvements driven by IoT are estimated to reach €11 trillion by 2025\(^1\). The most relevant industry segments that benefit from IoT are consumer, transportation, industry & manufacturing (combined €1.1 trillion in 2017) growing between 8.8% and 29.4% annually (’17-’20).

As a result of this growth in applications, the amount of dedicated communication technologies increased in complexity as well. Based on the type of use-case, several generic and specialized technologies have evolved, and are widely used (like WiFi and Bluetooth). Specifically, consumer-oriented household appliances (Like Smart TVs, Smart Lightning, Cameras, etc.) are connected through these technologies that do not require any Telco or infrastructure player as a provider.

![Diagram of communication technologies](image)

Source: Solon

Telcos and infrastructure providers traditionally have focussed their efforts on fixed broadband (DSL, Fiber) and cellular networks, such as GSM, LTE and (soon to come) 5G. The “Internet of Things” however, also requires new cellular technologies in order to cope with a multitude of different use-cases (e.g. low energy requirements, ultra-narrow-band capacities, etc.). These new technologies like CAT-M1 and “Narrowband-IoT (NB-IoT)” are currently implemented by most operators and are commonly known as “Low-Power Wireless Area Networks” (LPWANs)

In addition, alternative Low-Power Wireless technologies have emerged that do not require a licensed spectrum from an operator – like LoRaWAN (by Semtech) and Sigfox. These technologies allow for local deployments (e.g. in a warehouse, on a campus or in a city) and can be very cost efficient compared to an operator-based technology like NB-IoT. Hence, they are perceived as a threat by some operators.

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\(^1\) Morgan Stanley, Goldman Sachs, Gartner, R-Style Lab, Solon
IoT Connectivity comparison

There are numerous IoT use cases and application areas across all industries. Depending on the use case, the most appropriate connectivity technology will be chosen based on the specific requirements of the application. The most relevant parameters for the choice of technology are bandwidth requirements, latency and cost of the solution (devices & network).

While “nomadic” connectivity technology such as WiFi and Bluetooth will remain the biggest part of the IoT market, we expect LPWANs to surpass the cellular connectivity market in the future in terms of connections. Conversely, cellular technologies such as LTE and 5G will be utilized for high availability and mission critical applications that require dedicated Quality of Service (QoS). Due to long lifecycles of existing solutions (e.g. Smart Meters), we predict that the “old” cellular GSM and 3G technologies will remain in the market for some time.

However, the capabilities of LPWAN allow for a large application area in “low data” and “uncritical” use-cases, especially due to its low power consumption. As cellular connectivity and sensors have relatively high power requirements, they are less suited than LPWAN for IoT use-cases that require battery lifespans of several years. LPWAN technologies are also more reliable and less cost intensive than cellular connectivity, while simultaneously offering wider signal range – particularly in rural areas.
It is important to point out that LPWAN is not one particular technology – but a group of (partly rivalling) systems and players. Hence, the complexity in this field is increasing and we do not expect a “Winner takes it all” scenario.

**IoT positioning options for connectivity providers**

Due to strong growth prospects and increasing customer demand, the IoT market has seen a lot of activity from Telcos and infrastructure providers globally. Since the IoT market is expected to further continue along its impressive growth trajectory, Telcos and infrastructure players still have the potential to capture a meaningful share of the opportunity.

Telcos are exploring different routes in terms of positioning and portfolio options to address this opportunity – ranging from pure IoT connectivity to integrated IoT service provider approaches.

We believe that the connectivity layer is for most Telcos the logical “base” case. As described above however, even this can be a tricky business model. Telcos and infrastructure providers have to understand the requirements of their customers and start to develop a portfolio of relevant connectivity options in order to meet the needs of the different industries and customers. This is why some Telcos have started to offer non-licensed LPWAN technologies (like LoRa) in addition to their own (licensed) NB-IoT network service, because use-cases for very low-end or even “disposable” equipment (e.g. pallet tracking) would otherwise be too expensive.
This “managed connectivity” approach on the other hand also enables Telcos to move from a cellular connectivity provider approach towards a value adding “service enabler” role, in which not only the various connectivity solutions are managed but device management, data analytics and decision support can also be provided across different connectivity technologies.

Thus, Telcos and infrastructure players are in theory well positioned to provide end-to-end IoT services, ensuring the most relevant connectivity for industrial applications. In addition, Telcos have the ability to offer a variety of different pricing schemes (e.g. by device, by consumption, by availability, by latency etc.). This capability is a key differentiator towards competition from “pure-play” LoRa or Sigfox LPWAN players.

**Summary**

IoT is a clear growth opportunity for Telcos and infrastructure players. Due to the tremendous growth in the number of connected devices as well as significant advancements in IoT networking solutions, cloud-based data analytics and platforms, IoT is being implemented in a broad array of industries in various guises.

Telcos and infrastructure players are well positioned to take advantage of the IoT connectivity opportunity by leveraging and extending their existing assets and providing end-to-end connectivity solutions for IoT. Hence, we recommend them to enlarge their cellular service portfolio towards multiple LPWAN technologies, which offer low power consumption and extended battery life compared to traditional cellular technologies and hence will be the preferred technology in a vast amount of IoT use-cases.

By positioning themselves as a “managed service provider”, Telcos will furthermore be able to tap into more value-added service areas like data analytics & decision support and hence move to a more differentiated position in the IoT value chain.
About Solon

Solon Management Consulting supports companies that are active in the media, entertainment, telecommunications and technology industries. Solon advises leading media and telecoms firms as well as banks and private equity investors. Solon works with clients on the development and implementation of company strategies, creation of new business, performance improvement and capital market transactions. With offices in London, Milan, Munich, Paris and Warsaw, and together with its US partner Altman Vilandrie & Company with offices in Boston, New York and San Francisco, Solon works on projects across Europe and Africa as well as across the Americas.

Our role as trusted advisor to C-level executives from blue-chip companies throughout Europe and beyond is also reflected by our selection as #1 TMT advisor and “Hidden Champion” among consulting firms by an independent institute for the 3rd time in a row.

### Ranking of consulting firms by TMT expertise – 2018

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**Basis**
Survey of 730+ C-level representatives of German major enterprises, by WGMB

2018 consulting firms ranking by TMT expertise
Marco Cordoni is Partner and Managing Director, based in Solon’s London office. Marco has over 20 years of consulting experience within the telecoms, media and technology (TMT) sectors. He focusses on transaction services and M&A/corporate finance deals as well as on strategy and business development for telecoms operators, infrastructure players and media groups.

Mirko Gramatke is Managing Director, based at Solon’s Munich office, with almost 20 years of industry and consulting experience in telecommunications, media, entertainment and technology. He advises leading international TMT clients on strategic and operational issues as well as large scale (digital) transformation programs. Mirko is leading the “tech-enabled business innovation activities” at Solon, developing innovative business models leveraging new technologies - such as blockchain, AI and IoT.

Ansgar Schlautmann is Managing Director, based in Solon’s Munich office, with more than 22 years of industry and consulting experience. Ansgar is responsible for multiple large scale IoT strategy and implementation programs for various players from a wide range of industries and geographies. Additionally, he is an expert in digital and data driven business models.

Tomasz Hajduk is Principal based in Solon’s Warsaw office. He has broad experience in advising leading industry players and investors across a wide range of strategic issues in the TMT market. Tomasz serves clients across Europe with a primary focus on Central and East Europe. He holds an MBA from INSEAD and a master’s degree in Finance from the Warsaw School of Economics.

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