

How telcos can play a central role in the \$15 billion AI market starting with 4 key use cases

MIRKO GRAMATKE, CEM DILMEGANI

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There is an ongoing AI (r)evolution as improved machine learning techniques, which form the most commercially important subset of AI technology, are enabling companies to discover and operationalise previously hidden insights. Increasing data availability and higher processing power are facilitating this evolution, allowing better methods to be used on more data at lower cost. Telecoms operators are well positioned to take advantage of this revolution by optimising their own business activities and acting as “technical” AI platform enablers for other industries, which are expected to spend ~\$15bn annually on AI business operations by 2021. In this paper, we outline the initial steps to take for telecoms operators to claim their share in this strongly growing market and describe four high priority use cases for AI-based network roll-out planning, customer focused network optimisation, marketing optimisation, AI/advanced analytics guided sales steering.

Introduction

Approaches to AI

AI is mutually defined as a computer system that is able to perform tasks usually requiring human intelligence.

There are many different approaches for realising and enabling artificial intelligence (AI). In this paper, we have combined different approaches, to define the key components of current AI solutions, which are as follows:

- **Data analytics tools** review data from past events and identify patterns. Such tools have formed the core of analytics since the 2000s and are most commonly used as decision support tools rather than as operational tools.

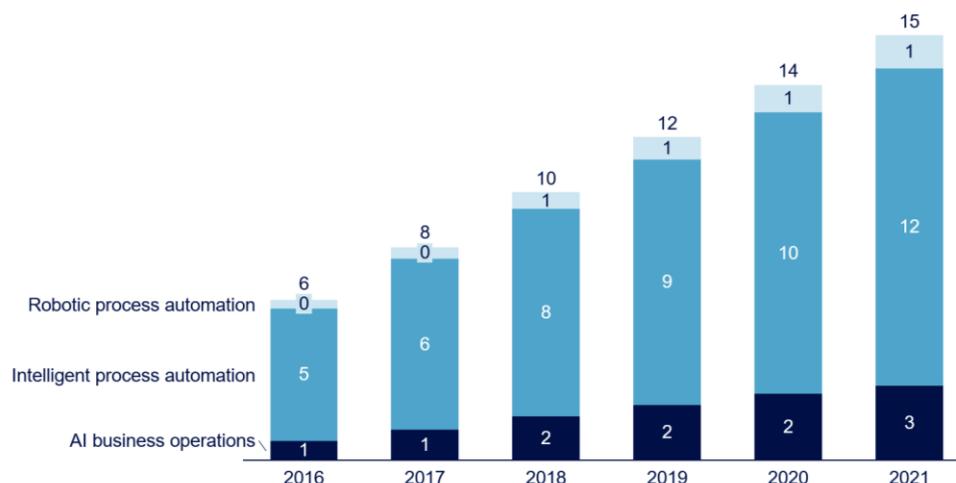
- Predictive analytics** involves predicting future outcomes by making assumptions that are based on the testing of past and real-time data. Predictive analytics can be both a decision support tool or an operational tool. Predictive analytics has been growing since the early 2000s. Recommendation engines built by tech giants like Amazon and Netflix are one of the earliest examples of predictive analytics systems that directly interact with the end users. Since the 2010s, predictive analytics is becoming commonplace in numerous industries, using advanced heuristics to work with only a fraction of the data.
- Machine learning** solutions and systems analyse data, learn relationships and provide predictions at a scale and depth beyond the capacity of individual analysts. Most AI tools are operational systems that make real-time decisions.
- Cognitive computing technologies** aim to replicate the human senses by enabling AI systems and applications to analyse texts, pictures, videos and spoken language.

The AI market

With regards to spending, the AI market is typically split into the following three categories of AI use case:

- Robotic process automation:** rule-based bots that integrate with common enterprise systems and handle highly repetitive processes at high volume, using basic AI functionality such as optical character recognition (e.g. invoice to payment)
- Intelligent process automation:** bots that automate processes requiring judgment such as commercial contract understanding, insights, and implications. Requires machine learning capability
- AI business operations:** dynamically self-adaptive systems used for predictive decision making

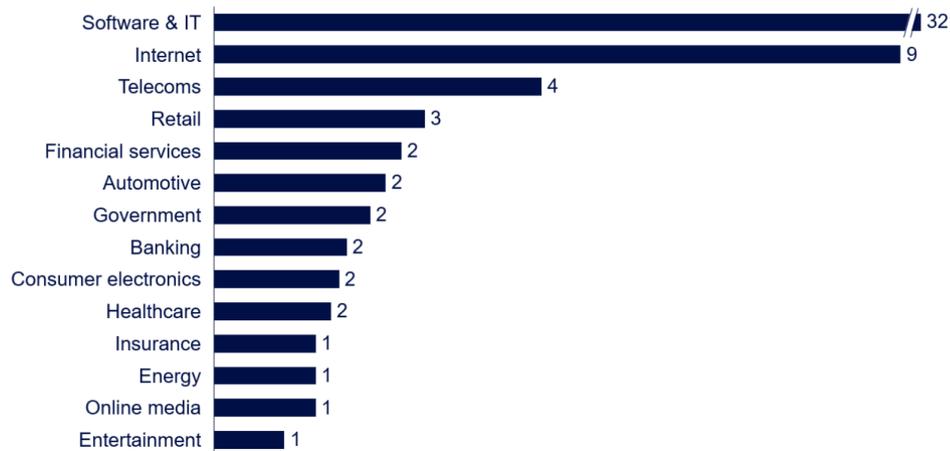
Based on current trends and expected future AI use cases, AI spending is expected to reach ~\$15bn by 2021.



Spending on automation and AI business operations worldwide by category, USD bn

Source: Statista, Solon

The readiness and willingness to invest in AI solutions and business operations varies between industries. Unsurprisingly, software and IT companies are at the forefront of investment in AI-based solutions for their customers.



Share of companies investing in AI worldwide in 2018 by industry, %

Source: Statista, Solon

However, telecoms is one of the top industries in terms of data granularity and digitisation making it one of the most suitable industries for analytics. Given the scale of integrated telecoms operators and their relatively high EBITDA margins, telecoms companies have historically had the investment capital to take advantage of the potential of analytics and turn their companies into pioneers in the field, in their respective countries. Based on this dynamic, telecoms companies are expected to invest heavily in AI – reaching more than \$0.6bn by 2021.

Drivers of AI

Artificial intelligence is not a new concept and can be considered an extension and further operationalisation of analytics. However, whilst the technology has been around for a long time, three powerful forces have in recent years accelerated the AI revolution:

- **Increasing data availability:** Available data is doubling roughly every 12 months thanks to both an increasing number of connected devices and increased rate of data production by connected devices, as they are fitted with more advanced and accurate sensors. New statistical models for probabilistic reasoning enable new ways of managing and analysing very large data sets, leading to advances in AI.
- **Increasing processing power:** Processing power continues its exponential growth, allowing AI solutions to be implemented on more data at lower cost. Furthermore, **distributed networks** (e.g. cluster computing via the cloud) have **become exponentially more powerful, making** processing capacity more accessible.
- **Improved machine learning capabilities:** Academic and commercial interest in AI/ML has been growing strongly with large tech companies devoting significant capital to AI research. For example, the number of AI papers published by Google has doubled between 2012 and 2016.

Four high impact AI use cases for telcos

The impact of AI is best understood through examples. At the heart of each example lies the fact that AI and machine learning helps companies understand customer needs in finer detail, in turn helping them to optimise their investments and individualise offers to their customers.

1. Optimised network roll-out planning

Mobile telcos spend hundreds of millions on spectrum licenses. The network they build to leverage that spectrum is key to monetising their investment. Network engineers analyse existing network KPIs, investment constraints and choices offered by equipment vendors to understand their constraints.

Network planners also need to understand the target KPIs for the new network, which may be guided by marketing, strategy or network management leadership. While high-level target network KPIs are important and are directly impacted by network parameters, ideally a business should also look to optimise commercial outcomes by minimising churn and maximising up-sell opportunities. AI can provide the missing link between network KPIs and customer decisions, allowing telecoms companies to optimise for customer decisions, rather than for technical parameters, which may or may not be as relevant to the consumer.

Similar challenges exist in the fixed network where operators spend billions on rolling out fibre or DOCSIS 3.1 networks, with a relatively high-level prioritisation of roll-out locations. A customer-level model could prioritise roll-out more effectively and guide sales and marketing activities to the customers that are most likely to value faster broadband products.

2. Customer outcome focused network optimisation

Linking network KPIs to customer outcomes is also beneficial for network optimisation. As part of network optimisation, network engineers track a long list of network KPIs in an effort to minimise customer complaints and optimise customer experience given network constraints. By driving or walking through hotspots, variations in network quality for different operators are identified, merged with other network data and used to shape real-time network optimisation decisions. Whilst most operators now outsource a significant share of network optimisation tasks to network management giants like Nokia and Huawei, telecoms companies still need to set granular target KPIs for their network management contracts. This requires trade-offs between network KPIs and cost. An AI model linking network KPIs to customer decisions can help telecoms companies improve the ROI of their network.

Case study – Network optimization

An Eastern European mobile operator built an inhouse AI-powered, customized system for their network planning decisions. 'Random forests' - a machine learning technique - was trained on customer and network data to identify investment opportunities that optimized ROI given the company's financial constraints. Network planners were initially skeptical of the tool. To convince them, different scenarios were explored and the model was fine-tuned with network planners' support, by testing model recommendations against those of network planners during pilot phase. The model's recommendations resulted in an initial 5-15% improvement in KPIs like churn and cross/up sell and has since been adjusted for further performance improvements. Now the model is deployed to production, optimizing telco's network planning.

3. Marketing optimisation: AI enabling telcos to optimise audience / time / channel / message / offer of their outreach lead to increased revenues with fewer customer interactions

Telecoms companies have been at the forefront of intelligent customer offers since the 2000s with their SMSs targeting customers in a variety of scenarios based on geo-location or behaviour. Beyond pre-determined scenarios, every aspect of marketing communication can be customised increasing both financial outcomes and customer satisfaction. An AI-based model can enable auto identification of possible tipping points that result in churn or upsell for each customer, triggering a potential list of network optimisation actions. For example, a customer reaching 95% of their data usage limit for the month could be offered slightly faster speeds, thereby enabling them to consume more data and become a more valuable customer.

However, there is no free lunch and it is the same for marketing communications – every message has a cost, especially if it is not well targeted. As a result, there are a new crop of marketing AI companies that now offer solutions to:

- **Identify the right audience and offer:** As well as identifying the best possible offer for each customer, next best action (NBA) models can also estimate the likelihood of such customers taking up the offer, thus helping companies reach the customers that are most likely to convert. Not reaching out to customers that are unlikely to be interested is an easy way to save costs and improve NPS. For example, a leading Eastern European operator was able to reduce its marketing SMS volume in its data upsell campaign by half while retaining ~90% of upsell. For the remaining customers, more specific behaviour-based offers were sent, leading to 30% more upsell compared to previous campaigns.
- **Identify the right time and channel:** Telecoms companies have a host of data demonstrating when their customers are more prone to answer calls or messages or whether they prefer calls over messages. In best practices, these preferences are

harnessed to create personalised messages. Going beyond their own products, telecoms companies over time discover their subscribers' propensity to respond to different channels such as emails, advertising or direct emailing.

Identify the right message: Historically, messages were either mass distributed or sent based on pre-defined rules, meaning that marketing executives could scrutinise every word and image in messages. For example, all customers that were approaching their data usage limit received the same message. However, not everyone responds to the same message. While some may be more responsive to reading that they can continue watching YouTube by purchasing an extra data package, others may be more responsive to seeing that they will face a sticker shock unless they upgrade to a plan that provides data at a more economical way than their current plan.

4. AI/advanced analytics guided sales steering

In addition to network operations and marketing, AI can also be used in sales optimisation. While relatively simple analytical techniques were used to identify sales and marketing opportunities in the past, more sophisticated AI-enabled models can be applied to efficiently enable and steer the B2B and B2C sales activities.

Based on the customer and business potential as discussed in the network planning example, AI solutions will help to identify areas where there is greater business and therefore sales potential. These areas can serve as a guide to the B2C and B2B sales teams for individualised and targeted campaigns. Combined with a variety of AI tools that use unstructured data such as recordings of customer calls, sales leaders can focus their teams on areas where they are most likely to close sales.

Geo marketing approaches are nothing new, but AI has the potential to create more detailed B2C and B2B customer profiles and derive priority areas for targeted campaigns by automatically mapping sociodemographic and psychographic attributes with geo-location information at a customer level.

Emerging best practices in AI for telecoms operators

Setting up the advanced analytics engine for your organisation requires prioritisation to focus on the most impactful issues, appropriate goal setting to energise the organisation, right division of responsibilities to empower the organisation and opportunistic use of resources, either in-house, outsourced or via AI vendors to operationalise analytics and to automate operational decision making. Starting out with a robust framework for leveraging AI can help you tackle these complex issues simultaneously, and help your organisation create a self-reinforcing analytics feedback loop, enabling your organisation to create digital decisions with closely monitored goals, leading to a deeper understanding of your business and improved decision making and results monitoring.

Though there are still relatively few cases of operational deployment of advanced analytics systems, a few key success factors are emerging based on our interviews with industry participants:

- **Correct prioritisation of AI use cases** is key to mobilising the organisation: simple use cases can have outsized and fast impacts to operations, galvanising support for additional advanced analytics projects
- **Timely resolution of organisational conflicts:** Rolling out machine learning solutions to replace rules-based systems augmented by experts can lead to conflicts. To resolve such issues, project ownership needs to rest with the business. Ambitious goals regularly tracked by the CEO can be leveraged to ensure that the business performs to fulfil the requirements of its project ownership. IT or strategy are required to support the roll-out, however without full ownership of the business, analytics projects tend to experience delays and adoption issues
- **Centralising modelling:** Mapping the functionality of advanced analytics is key to avoiding duplication, which can lead to a waste of human and financial resources
- **Using the right mix of external and internal AI resources:** Different AI use cases require a different mix of in-house developers, off-the-shelf solutions or outsourced experts building custom solutions. For example, in cases where your company has access to unique and valuable data, an in-house solution is likely to be appropriate. However, for other use cases, off-the-shelf or outsourced custom solutions can be appropriate depending on the cost and value of the project.

Success in AI would not only help internal operations but also create new business opportunities

Becoming leading users of advanced analytics and AI opens new business opportunities for telecoms companies. While telecoms companies have expanded beyond their initial residential business in the last 10 years to provide both wireline and wireless solutions to their B2B customers, their B2B suite of offerings still has significant potential for expansion. Numerous telecoms operators have already launched data centre, cloud as well as other ICT products and services for their B2B customers. AI is being integrated into numerous tech products and services (e.g. face and voice recognition delivered via cloud computing, advanced image processing capabilities delivered via robotic process automation tools that integrate with most enterprise software) and telecoms companies have a chance to remain at the leading edge of AI and offer improved products and services for their B2B customers.

Telecoms companies typically own a comprehensive B2B salesforce and thus are in a unique position to upsell to their customers. We see 4 types of AI-related business opportunities for telecoms companies today. Starting from the simplest and easiest to implement, these are:

- **Resale of data:** AI systems are data hungry, since they require data to learn more about the problems they are solving. Telecoms companies have access to numerous granular data points about their market which can be valuable for AI companies. Telcos could explore how to monetise this valuable data while protecting user privacy and abiding by GDPR rules.
- **Resale of products,** selling AI-powered products developed by AI companies: Most telecoms companies already resell software to large and small businesses, so this would represent an expansion of their portfolio.
- **Implementation:** Telecoms companies, especially those that have established themselves as system integration/implementation solution providers have a chance to extend their portfolio with AI-powered products. For example, telecoms companies are already rolling out robotics process automation solutions to automate their companies' processes. Most telecoms companies working on implementing robotic process automation are setting up centres of excellence to support the whole organisation. The expertise developed in-house can be marketed to other large companies working on their own process automation journey. However, this is a relatively labour-intensive business where telecoms companies would compete with system integrators and consulting companies.
- **New solution development:** While the global AI market is quickly becoming fiercely competitive, there is space for customised local solutions, especially considering that data is the most important asset for AI and telecoms companies have access to vast amounts of data based on their own operations. Whilst the development of new solutions offers the largest margins, it is also the hardest to be successful at, as it requires an understanding of local market needs and a competitive technology team on top of a great salesforce.

First steps for a telecom operator on its way to becoming an AI powerhouse

Diversifying away from pure telecom services has been challenging for telcos. Despite their attempts to diversify away from the access business, telecoms operators in the past ~30 years of their existence have been primarily providing the infrastructure that first enabled the internet revolution and later mobile and cloud revolutions. Even the current push to fiberize Europe by governments such as in France and Germany, or 5G roll-outs can be seen as mainly enabling the growth of online video – a business mostly owned by YouTube, Netflix and others.

Given the challenges of diversifying away from the telecom business, we suggest an incremental approach that allows telcos to grow their AI capabilities without committing excessive capital, starting with initial steps that are already successfully undertaken by leading telecoms operators:

- **Set up the company's analytics engine:** While most telecoms operators now have CDOs and heads of analytics shaping the data agendas of their companies, progress is usually slower than expected. Some first steps that are sometimes skipped include: creating the company's data dictionary, assigning data owners, aligning legal and analytics units on how data can be used within the existing legal and regulatory framework and aligning organisational units on the distribution of analytics responsibilities between the analytics units and the other units
- **Implement high priority use cases with a mix of internal and external resources:** We have provided four high priority use cases in this paper; however numerous others exist. For example, rolling out robotics process automation to automate simple but repetitive processes enables telecoms operators to digitise their processes which can be improved further with increased use of AI in decision making. Following typical change management best practices such as communicating early and often and achieving early success can certainly help in empowering employees and increasing rate of transformation
- **Pursue AI-based businesses selectively:** Starting with just resale of data and AI applications can help a telecom operator to understand demand in the local market and shape its external AI strategy.

Following lean principles, running results-oriented pilots and ensuring effective cooperation between technology, sales and marketing organisations are critical at all three steps of this journey. Though these are fundamental changes that can bring in significant margin expansion, they need not take a long time as they rely on assets that already exist in successful telecoms operators: data availability, analytics know-how, a strong sales organisation and a results-driven management.

Executive Summary

AI is one of the most exciting opportunities for telcos thanks to increasing data, improved analytics and increasing computational power. Telecoms operators are well positioned to take advantage of this opportunity to optimise their own business activities and act as a “technical” AI platform enabler for other industries which are expected to spend ~\$15bn annually on AI business operations by 2021. In this paper, we outline the initial steps for telecoms operators to claim their share in this strongly growing market and describe four high priority use cases to operationalise automated decision in critical areas of their business:

- **Optimised network roll-out planning:** AI/advanced analytics can help telcos move from deploying network to achieve network KPIs to deploying a network that optimises for financial outcomes such as cross/up sell, renewals and new subscriber gains
- **Customer outcome focused network optimisation:** Similar to network planning, AI can help provide the link between network KPIs and profitability, allowing optimisations of financial outcomes
- **Marketing optimisation:** Telcos can improve the time, channel, message and offer of their outreach, improving their marketing ROI
- **AI/advanced analytics guided sales steering:** Granular assessment of market potential and advanced analysis of structured and unstructured sales related data can help better focus sales teams

About Solon

Solon Management Consulting is advising leading industry clients and investors worldwide in the telecommunications, media, entertainment, online, cloud and technology industries. Solon supports its clients in developing and implementing company strategies, developing new business models, accelerating digitisation, optimising costs and investments as well as accompanying M&A activities from market probing to the closure of transactions. Solon’s offices are located in London, Munich and Warsaw as well as – via its partner company Altman Vilandrie & Company – in Boston, New York and San Francisco.



Mirko Gramatke is a Managing Director, based at Solon's Munich office, with almost 20 years of industry and consulting experience in telecommunications, media, entertainment and technology. He advised leading international telecommunications, media and tech companies 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, artificial intelligence and IoT.



Cem Dilmegani is based in Solon's London office. He has nearly a decade of experience advising on strategic issues in the TMT sectors in Western Europe, Middle East and South East Asia both as a consultant and as a member of the executive team. He also founded appliedAI.com, the first marketplace for AI companies. Cem holds an MBA from Columbia University and a Bachelor's in Computer Engineering from Bosphorus University.

For further information or questions, please contact us:

Phone +49 89 210388-0 (Munich)
 +44 20 7766 0500 (London)
 +48 22 417 1250 (Warsaw)

Email contact@solonstrategy.com

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