act on your intelligence: seizing the AI opportunity for communications service providers

An AI roadmap for CSPs

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executive summary

In brief

Communications service providers (CSPs) are working through the challenging process of digital transformation, driven by the need to compete with fast-moving OTT and consumer tech players. CSPs need to move quickly and can advance digital transformation with solutions that leverage artificial intelligence (AI), which can drive value across the business from network optimization and data analytics through to customer care and marketing engagement. Many CSPs have already committed to infusing AI across their operations – notably AT&T, Telefonica, and ST Telecom – while others are still formulating their AI strategies. But whatever their position in this journey, CSPs need guidance in evaluating AI and how best to move forward. This paper is designed to support CSPs, providing a clear-headed perspective on AI and an actionable roadmap on how to maximize the AI opportunity.

Key messages

- AI is the future of automation, providing new efficiencies and streamlining at a massive scale of millions of data points, whether they be performance metrics from the networks or customers.
- CSPs need to avoid the twin dangers of becoming a laggard in the market as a reaction to AI hype or of being too visionary and ending up with products for which the market is not ready. Ovum recommends steering a pragmatic path: build AI expertise by working with AI experts and plan for clear use cases and definable ROI that uses today's proven AI technology.
- For a CSP AI strategy, take a three-step approach: identify and assess your opportunity; build the capability, with AI expert partners where you lack in-house expertise; and follow through with a managed lifecycle.
- Data fuels AI automation. Successful use of AI is dependent on access to data to build, train, and constantly improve the algorithms that power it.
- Customer personalization at scale, made possible through AI, is a prime differentiator for CSPs in a highly competitive market.
- AI applications must be introduced carefully and responsibly. AI applications need to be robustly tested to ensure that they perform as intended and to avoid any negative outcomes. Some users can be malicious and attempt to subvert a well-intentioned AI system.

Recommendations

intelligent marketing

- CSPs need to become more adept at personalization across all customer-facing touchpoints and services. AI capabilities are a key enabler on this front, driving advanced personalization at scale.
- The most effective AI solutions will be those that support a horizontal approach, accessing multiple data streams in real-time to produce intelligence that can feed into and enhance cross-domain business processes.
- AI can fine-tune the product catalog like never before. It can propose the optimal price, content, size, validity, or other parameters of a product catalog entry and configure it based on analysis of available data such as competitor analysis, advertising, customer feedback, and business support systems (BSS) data.
- Data privacy in the AI context is already attracting attention, and this will intensify going forward. CSPs should be proactive and visible in demonstrating how their AI solutions safeguard data privacy, building a reputation for trust that can act as a point of differentiation.

intelligent customer care

- Ovum's 2016–17 ICT Enterprise Insights survey shows that digital customer self-service is a top priority for CSPs. Given the benefits that AI-driven automation can bring to digital self-service, it makes good business sense to invest in customer care platforms with strong AI capabilities.
- CSPs should seek out AI solutions with cognitive engines that are optimized for their industry domain and business processes.
- CSPs should enable customer interactions via an intelligent conversational interface. This form of AI-powered human-machine interface plays a central role in next-generation customer care, supporting personalized interactions with customers.
- There will be times when even the smartest virtual assistants and chatbots need to pass queries to human-assisted channels, and it is therefore important to have solutions that can support this.

from data to intelligence

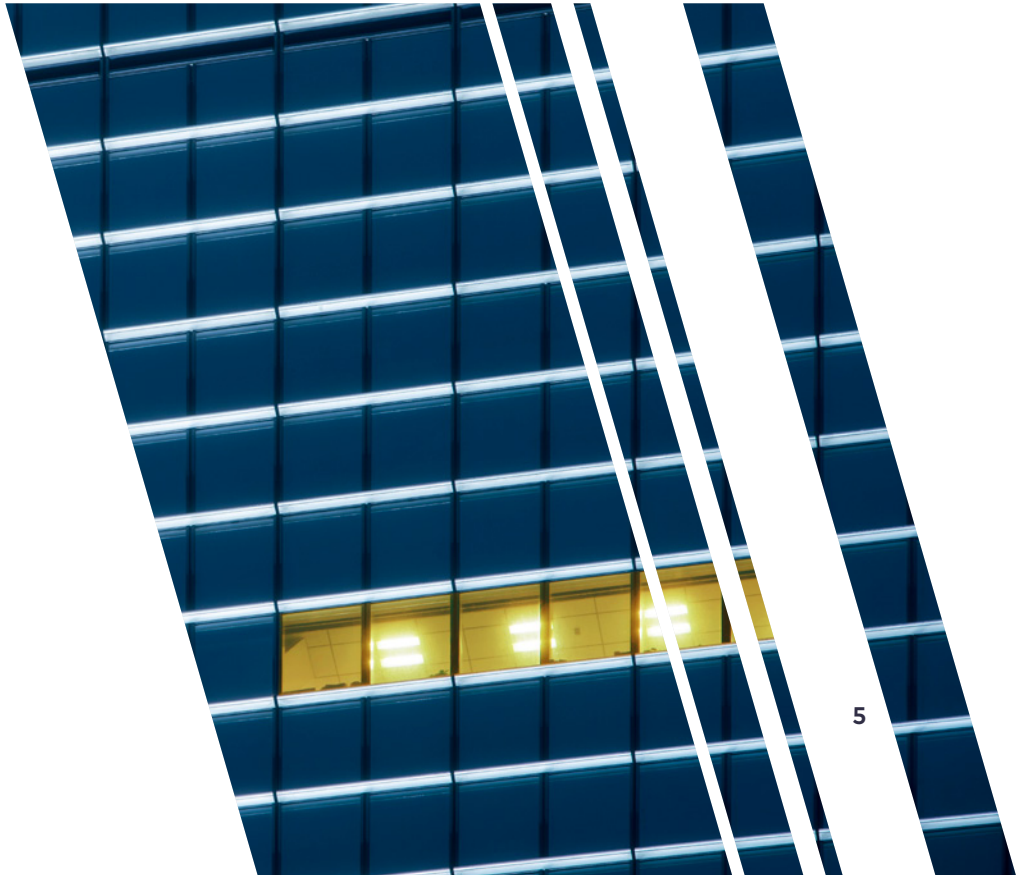
- CSPs need to understand what data is available and its relevance to AI opportunities. This means not just looking at new sources, but also reexamining the existing applications and systems around the business, including product catalog data.
- Predictive intelligence requires business context. An understanding of past events and the indicators that preceded them allows AI to proactively monitor and help mitigate future issues.
- CSPs will need to evolve their data architecture with new capabilities to acquire, store, and manage new data types. In many cases, placing these new capabilities in the cloud or another managed service can offer benefits – allowing the flexible scaling of technology without impacting the existing architecture.
- First- and third-party data are more than the sum of their parts. Internally sourced data is the foundation; enriching data sets with third-party data adds customer intelligence from outside the CSPs walls helping create a 3D view of customers.

intelligence in action

AI dynamics are changing

While AI in itself is not new, the rise of consumer-facing, AI-powered digital assistants (e.g. Amazon Alexa, Google Assistant, Apple Siri) and the emergence of AI-infused chatbots on popular messaging platforms suggests that something has changed. AI is a broad activity that ultimately aims to recreate the capabilities of a human brain in a machine. There are various shades of ambition, and to create a true human-thinking machine is called general AI, which is not possible today, whereas narrower AI that can perform useful and advanced intelligence tasks is possible today with recent breakthroughs, including the following:

- **Deep learning.** A class of machine learning algorithms that have improved levels of accuracy that can match or better human levels of cognition.
- **New forms of human-machine interface.** Natural language processing is used widely by voice-driven intelligent assistants and is improving rapidly. For example, Microsoft, an Amdocs partner, claims to be the first company to reach human parity in conversational speech recognition. Natural language processing intelligent agents, like chatbots, are being integrated into people's lives and have meaningful conversations. As these systems improve through continuous learning, they will also have the potential to be proactive.
- **From "one size fits all" to personalization at scale.** The application of machine learning to mining CSPs' big data makes possible automated personalized services that serve millions of customers at a time. This is the breakthrough to automated personalization at scale.
- **Help is at hand to help drive AI enablement.** AI technology is complex, and in the past this has proved a barrier to CSPs and other third parties wishing to harness AI to enhance operations and services. But this is changing dramatically as a range of technology companies provide the platforms, tools, and telecom-specific domain expertise on which to build the AI service ecosystem.
- **Increasing consumer exposure to AI.** Consumers are interacting with AI-powered applications on a regular basis without even being aware of it: personalized recommendations, online translation services, and fraud detection systems that protect their online transactions, for example. AI is already manifest as incremental improvements to internet services that consumers use and benefit from on a daily basis, and this will accelerate going forward.



Early adopters can gain immediate benefits

Ovum conducted a survey as part of its Digital Economy 2025 research, and the findings reveal that the telco market is perceived as the industry that is second-most at risk of disruption, as shown Figure 1. AI will play a large part in this change as CSPs look to implement technologies that can reduce costs through greater automation, better serve customers, and optimize network and traffic management.

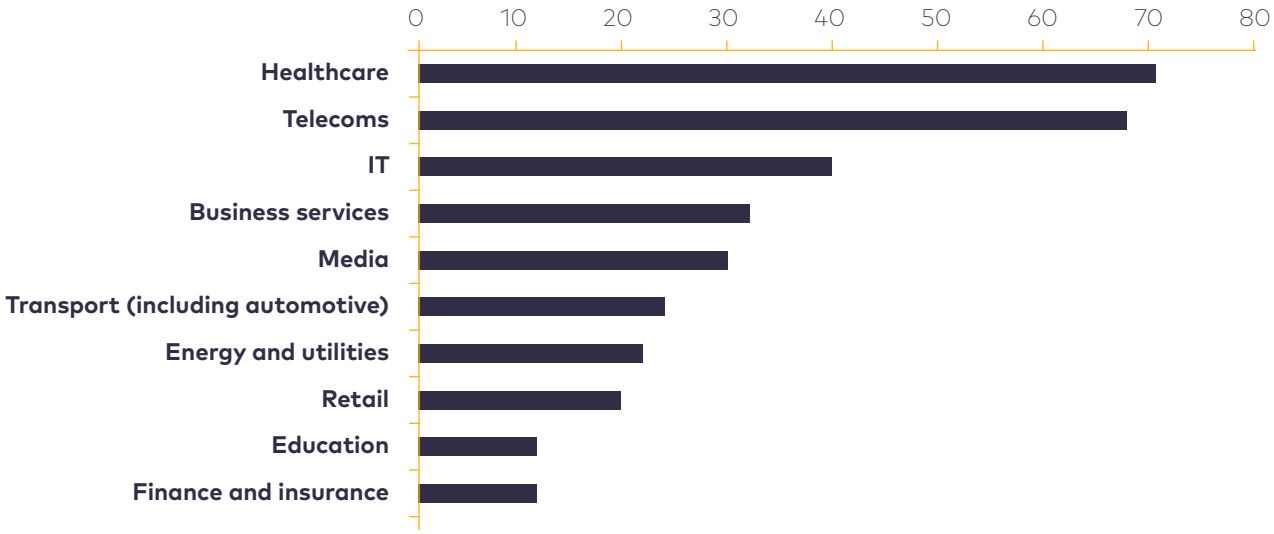
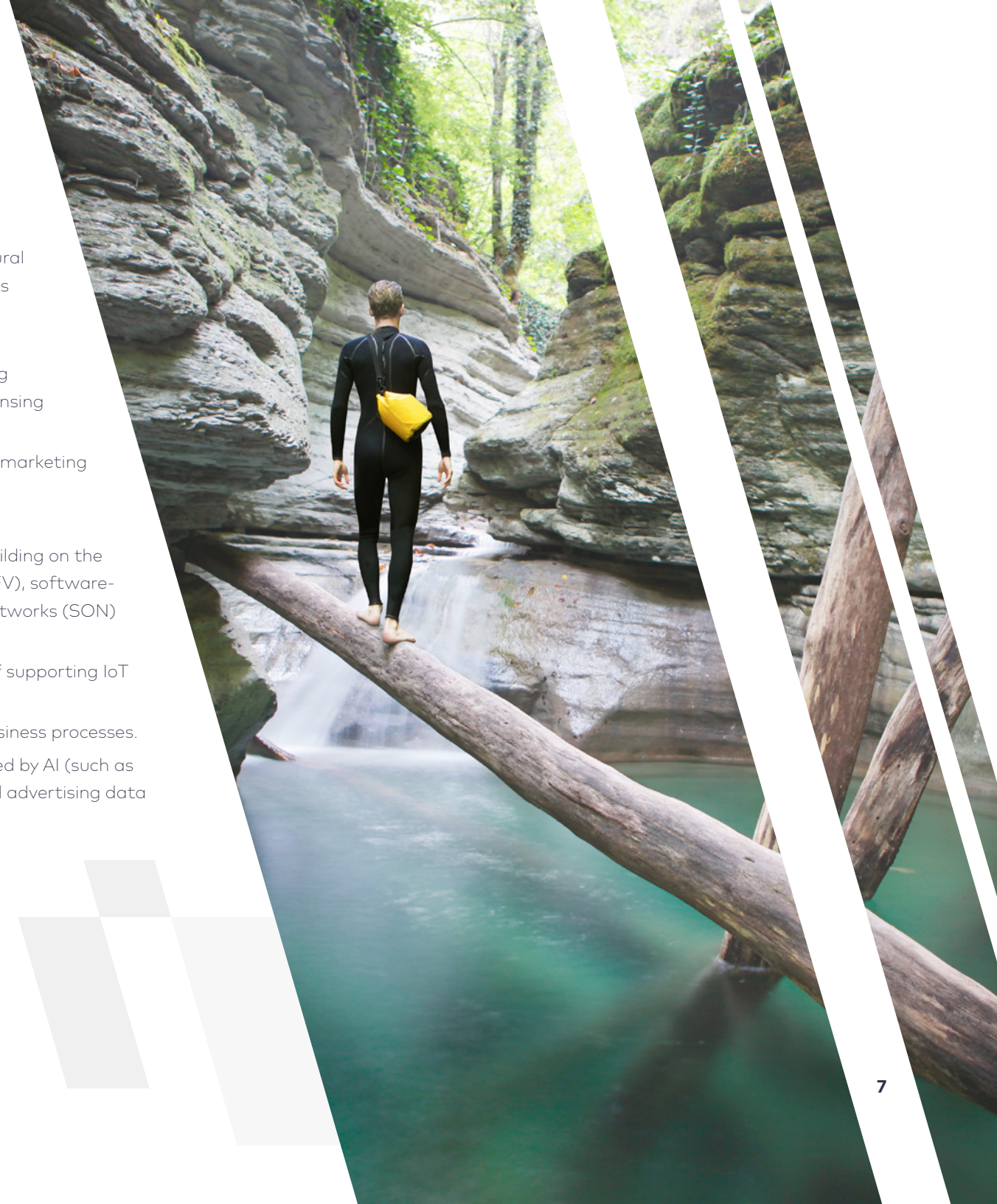


Figure 1: Industry verticals perceived to be at risk of disruption to 2025

Source: Ovum, N= 430 industry players

There are multiple opportunities for CSPs to leverage AI, as summarized below in what is by no means an all-inclusive list:

- Human-machine voice communication and natural language processing, as used in digital assistants such as Amazon Alexa, Microsoft Cortana, and Apple Siri.
- Call center first-line technical support for dealing with 80% of routine questions, with emotion-sensing capability (based on voice and/or video).
- AI for faster response to personalized sales and marketing triggers (e.g. creating and tearing down offers).
- Fraud detection and cybersecurity.
- Telecom network optimization and analytics, building on the transition to network function virtualization (NFV), software-defined networks (SDN), and self-optimizing networks (SON) – a key pillar for 5G and NFV networks.
- AI for designing a web-scale network capable of supporting IoT applications.
- AI to replace manual intervention in selected business processes.
- New entries in product catalogs can be optimized by AI (such as price and size). Deep learning of competitor and advertising data can be used to configure these entries.



AI is driving CSP digital transformation

AI helps CSPs keep ahead of new business demands

AI is a key component supporting CSPs' current and future IT systems, platforms, and processes. CSPs are transforming their business to create more streamlined and agile operations that can scale and respond to complex customer and business needs in near real-time. CSPs need to manage multiple SIMs per user, and the Internet of Things (IoT) is proliferating the number of devices connected to the communications networks. Network and service performance needs to be flawless, and CSPs need to provide rapid onboarding, access to content, accurate billing, and personalized customer management all the time. AI can help CSPs keep pace with these demands. CSPs can leverage solutions that use AI (both machine learning and deep learning) analytics tools and automation to systematically respond, operate, and improve their operational and business support systems.

AI impacts all aspects of CSP operations

AI can have a positive impact on CSP operations across the spectrum, as summarized in Figure 2. AI can take network optimization to new levels, bringing advanced intelligence to data analytics while making customer-facing operations and services more effective than ever before. The latter includes personalized plans and service bundles, more interactive marketing engagement, and proactive, efficient customer-care operations.

The intelligence-driven product catalog

AI solutions can extract data from one part of the business to feed other areas of the business, with self-learning capabilities constantly improving over time. By injecting intelligence across multiple areas of the business, AI can create cross-domain value. For example, it can leverage the customer behavior and engagement data to automatically fine-tune the product catalog offerings. AI can propose the optimal price, content, size, validity, or other parameters of a product catalog entry and configure it based on deep learning of the competition from available data such as advertising, voice of the customer feedback, and BSS data. It will also provide the justification for this recommendation, outlining the performance benefits; for example, "reducing the price by 50 cents will increase take rate by 2.1%." AI will adapt as needed and generate reports on item configuration performance. For example, in network management, if there's a network failure or a drop in quality, the AI solution can assist customer care by enabling proactive resolutions to preempt calls into the contact center.

The impact of AI on CSP operations

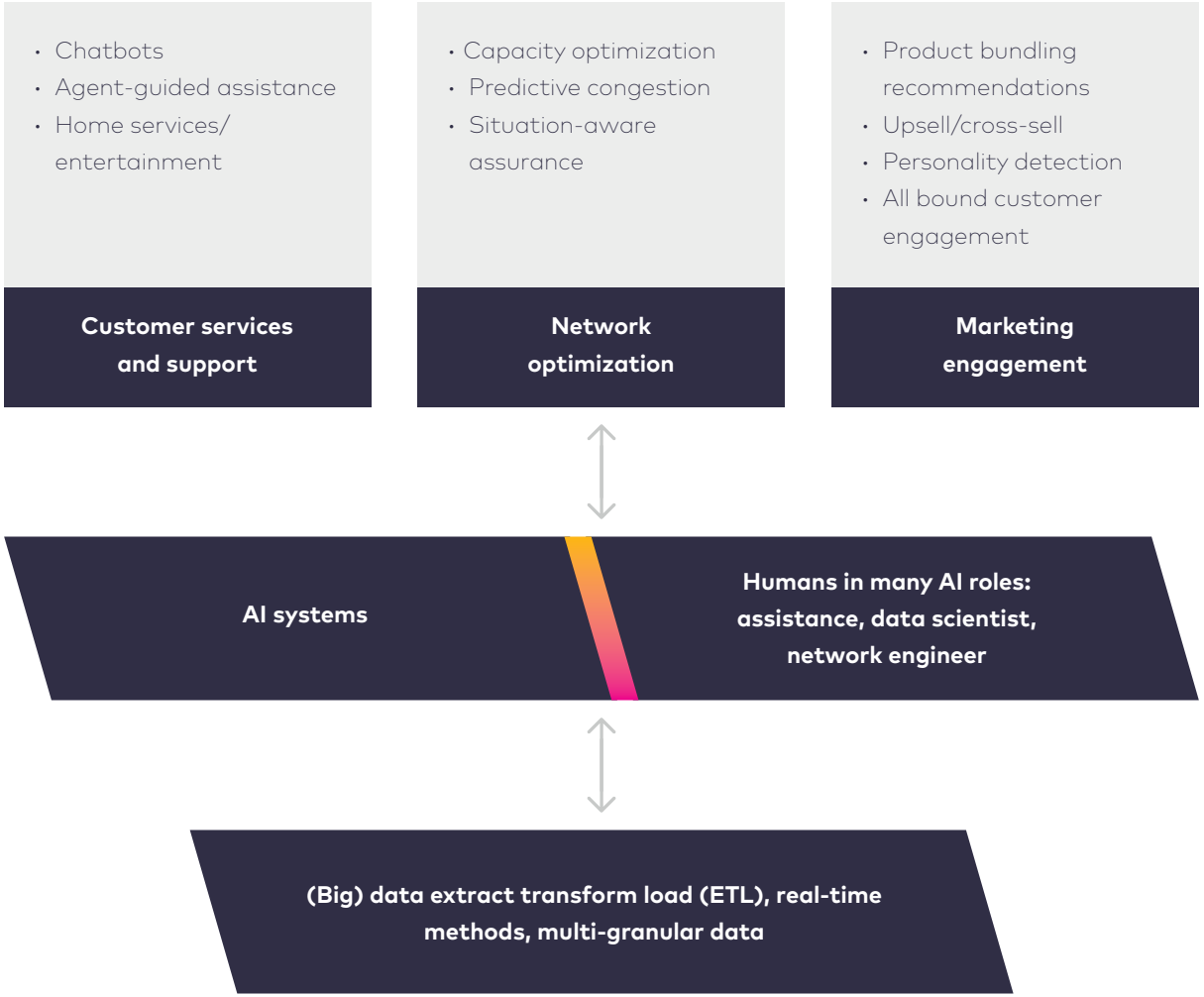


Figure 2: AI in the telco market

Source: Ovum

Network optimization

AI will be grounded in CSPs' SDN and NFV. For example, a fully NFV-enabled network will ultimately be controlled by a single NFV orchestrator (NFVO) that decides about critical network operations such as assigning more resources to a network function, creating new network elements, or tearing down network elements that are underutilized. Eventually traffic will be controlled by a centralized SDN controller that may be augmented by AI functionality. This will allow the efficient and proactive routing of traffic so that capacity can be managed effectively, network outages minimized, and faults bypassed. AI can also be used to optimize the configuration of a CSPs network according to dynamic network-capacity demands, the characteristics of the traffic volumes, user behavior, and other parameters. Network deployments may also be further improved by AI, which will be used to predict traffic patterns and forecast user trends.

Intelligent analytics

Using AI, CSPs will be able to process a plethora of data points and indicators. Understanding subscriber behavior, or the status of the network, can provide insights that can improve many different aspects of the CSP business, especially when it is pulled from network systems to feed into customer data held in the BSS. Some vendors are taking advantage of this data to provide advanced machine-learning algorithms for BSS and marketing purposes.

Marketing engagement

Understanding user behavior enables CSPs, through AI, to create personalized customer engagements for each customer, creating offers and messages that are contextual and done in real-time across a wide range of criteria, including personalized pricing plans, service bundles, and marketing messages. Personalized, real-time sales and marketing offers play a central role in CSPs' (data) monetization strategies as well as enhancing the value of customers' engagements and improving customer satisfaction (CSAT) and net promoter scores (NPS).

Customer care

AI has a huge role to play in improving the quality of the user/customer experience and therefore the quality of service. CSPs' strategies to monetize data are dependent on high levels of programmable intelligence and automation to handle the exponential increase in traffic and the onboarding of new devices and subscribers, along with the processing and actioning of personalized customer care responses.

The AI roadmap for CSPs

CSPs should take a strategic approach to adopting and exploiting AI technology. Figure 3 outlines the choices available. In terms of degree of acceleration of adoption, taking a "wait and see" position has benefits in being able to learn from others' mistakes, but if the market moves quickly it can lead to lost opportunities and possibly be fatal to the business. Conversely, taking a visionary approach may create products/services for which the market is not ready, but if the timing is right there are clear wins. The choice of which AI technology to adopt and whether to build homegrown solutions or bring in suppliers with expertise also leads to similar risk/opportunity considerations. Ovum recommends taking a pragmatic approach, balancing risk – since no one can tell the future for certain – but with some degree of adoption ahead of the mainstream market, mitigated by using proven solutions and expert suppliers. While internal AI applications are in the "good opportunity" segment, and we advise that they are supported by proof-of-concept trials and establishing metrics to monitor ROI, the external/consumer AI applications hold more risk due to market acceptance unknowns.

Taking a strategic approach to adopting and exploiting AI

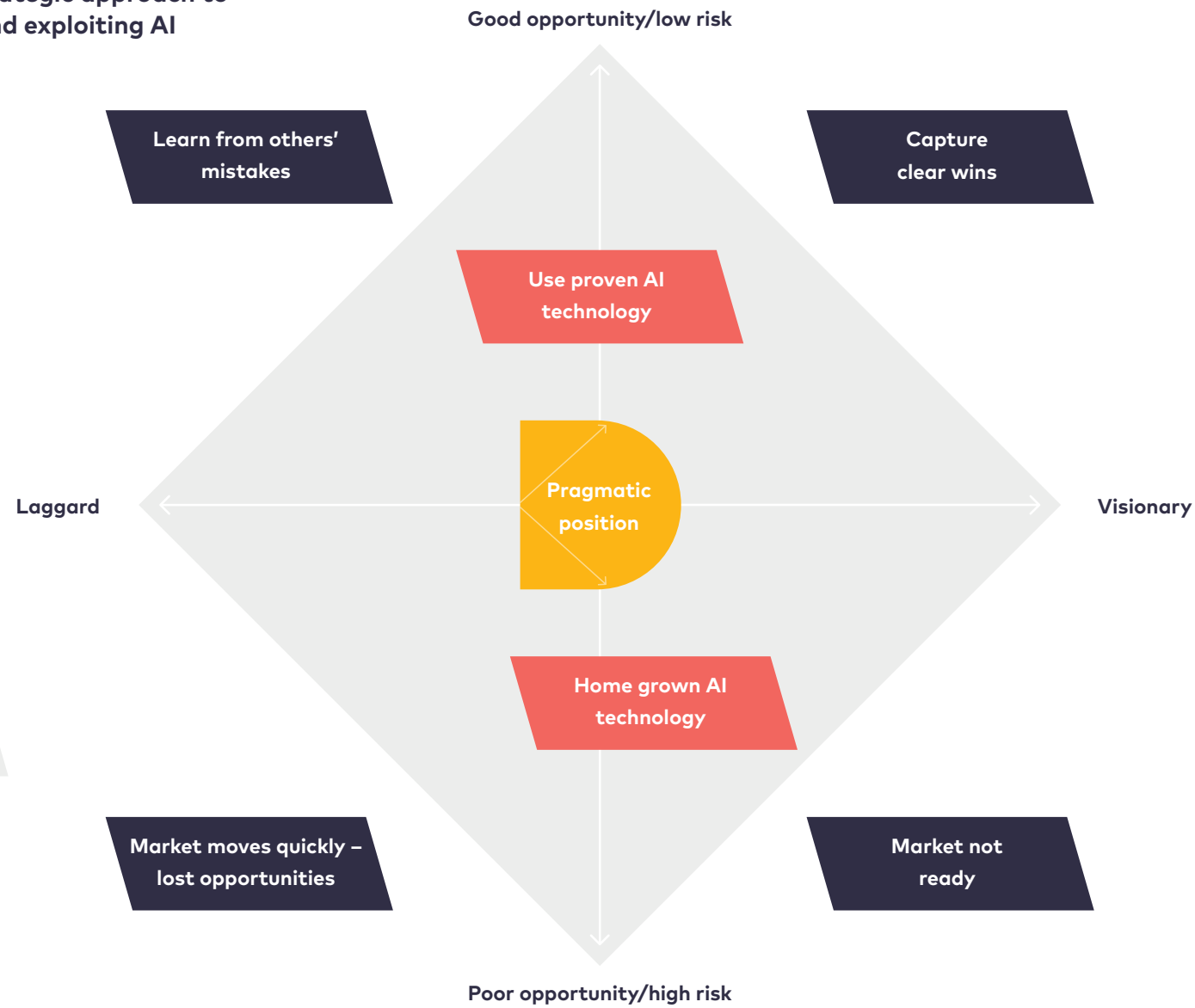


Figure 3: AI strategy choices

Source: Ovum

Roadmap milestones

Ovum's roadmap for AI implementation, summarized in Figure 4, is designed to help the AI adoption process.

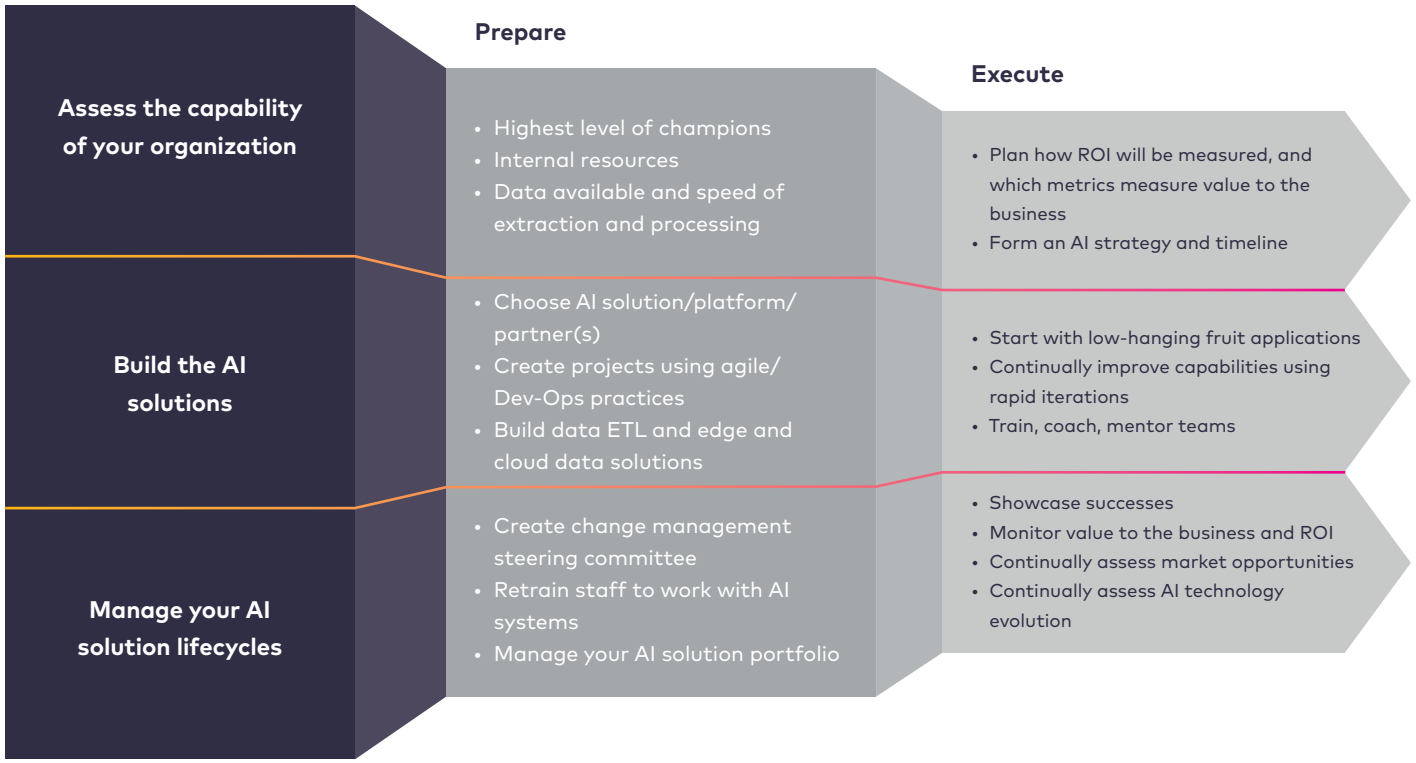


Figure 4: AI adoption roadmap

Source: Ovum

Assessment

The first stage is discovery of opportunities, and this report is intended to assist in this step, answering questions such as "what value will AI technology add to the business?" Support at the highest level in the organization will ensure the highest chance for AI projects to succeed. This step also involves assessing the skills availability within the business, and finally – and not least – understanding what data is available, which data is important, how much is being collected, and how quickly can it be extracted. Data is vital to train AI systems. Create an AI strategy and timeline, and plan for which low-hanging-fruit AI applications will deliver immediate benefits.

Building

The next step is building the AI capability. Decisions should be made on how the AI systems are built, with in-house resources and/or with external suppliers and partners. CSPs can go it alone, but as their core business is not AI, and as AI is undergoing rapid evolution, we advise partnering with an AI expert that delivers end solutions so that the CSP does not have to make bets on which AI technology to invest in.

The sophistication/scope/integration of the AI systems should also be considered – for example, whether the AI systems should assist humans and/or run autonomously, or whether they should provide responses to events and/or anticipate events and make predictions.

The machine learning part of AI as a discipline has been producing useful technology for many decades but has been joined by a new generation of cognitive capabilities making spectacular advances (such as with deep learning). CSPs should ultimately assess the overall value that vendor AI solutions deliver, irrespective of how that is achieved. CSPs should be reassured by suppliers who partner with AI specialists that do have the full range of AI capability – from decades old to the latest – so that solutions use the best tool for the task.

When implementing AI solutions, consideration should be given to where the data is located. Data on the cloud can be served by cloud-based AI solutions, whereas data located at the edge of the network is best processed by AI solutions that are built into devices co-located at the edge.

Ovum recommends using agile and DevOps disciplines to build AI solutions, so as to be able to rapidly fine-tune solutions or pivot when necessary, use evidence-based metrics to assess new features, and ensure solutions deliver value to the business.

Managing

The final step is managing the transformation in adopting AI technology. Support for this technology should emanate from the highest levels of the organizations – the board of directors and CEO – in order to be able to deal with the cultural challenges that this technology introduces. There should also be an initiative to create bottom-up acceptance, and this may involve hiring the right people with the appropriate skills.

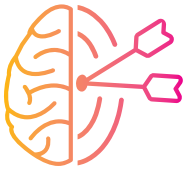
A change management AI steering committee should be created to manage the technology rollout and to monitor progress, showcase successes, and help deal with job anxieties that this technology may introduce.

The AI field will continue to evolve at a rapid pace and the AI steering committee should continually assess the state of the art in the field, continually assess the level of expertise internally, and continually assess the opportunities in the market.

AI challenges – and how to address them

CSPs face a number of challenges as they consider their next steps with AI technology, and they need to keep a watching brief on the following factors, many of which are still playing out:

- **The threat from faster-moving rivals**. CSPs are not the only players looking to leverage AI to improve operations and services to gain competitive advantage. OTT and consumer tech players such as Google, Apple, Baidu, and Facebook are investing heavily in AI. The danger for CSPs is that they may be left behind. CSPs should, at a minimum, initiate proof-of-concept studies if they have not already done so.
- **Potential privacy issues.** AI can leverage very granular consumer data insights and these capabilities will deepen going forward, to the point where they could attract regulatory scrutiny. CSPs should ensure their AI solutions can safeguard data privacy.
- **AI systems built for consumer interaction must be handled with care.** Consumer-facing AI services must be stress tested and monitored to ensure that they perform as intended and to avoid any negative outcomes – for example, malicious abuse by users.
- **AI impact on the workforce is not a zero sum game.** Ovum takes the view that while the job market will change as a consequence of better efficiencies and productivity introduced by AI-powered automation, this will open up new possibilities for human work. People will be needed to steer AI machine activities, set goals, provide data and training, and monitor machine activities and performance.
- **CSPs need to beware the hype of superintelligence that does not yet exist.** There is confusion between the as yet unattained advanced forms of super general AI, fed largely by the entertainment media, and the form of AI that is of practical use today, and this can lead to false expectations of what AI can deliver. AI partners can help clarify the real business benefits versus the hype that is clouding AI.
- **But ignore AI at your peril.** There is a double danger that ignoring AI because of the hype will cause a CSP to become a laggard, and this could be costly. This is the right time to explore and start using AI technology, but in a managed process and always looking for ROI and value to the business.



intelligent marketing

Personalized customer experiences are a priority for CSPs – and a major challenge

Customers desire and appreciate personalized services, particularly millennials. When well executed, personalization ensures that relevant services are targeted to match the needs and desires of particular customer segments, eliciting deeper engagement, satisfaction, and loyalty.

But CSPs are struggling with personalization, as revealed by Ovum's 2016–17 ICT Enterprise Insights survey. CSPs in the survey said that creating personalized customer experiences is their biggest business challenge. Almost 84% of CSPs in the survey said this was either a very important or important business challenge. The problem is that many CSPs lack sophisticated data analytics, which in turn means superficial customer insights that hinder their efforts to personalize customer experiences. Another major challenge is in fusing a wide variety of first-party data with third-party data in real-time to provide a single unified view of the customer.

The role of AI: from "one size fits all" to personalization at scale

The application of machine learning to CSP big data makes possible automated but personalized services that serve millions of customers at a time. Customers can be profiled with multiple characteristics, and an AI system can analyze this data to create a customized engagement tailored to the individual needs of the user. Since this process is automated, it becomes possible to move from standard tiered contracts, with their built-in compromises, to unique contracts designed around the needs of each customer. Only machine learning and automation can produce such a service at the scale of many millions of customers.

Intelligent agents can take personalization to the next level

AI-powered intelligent agents in the form of online virtual assistants, device-based digital assistants, and chatbots on messaging platforms can greatly enhance personalization. The deep data insights generated by intelligent agents combined with a conversational interface enables a highly interactive, personalized form of engagement with consumers. Intelligent agents can support one-to-one, automated conversations with consumers at scale – the nirvana of customer relationship marketing. Intelligent agents also have the ability to tap into and create very detailed consumer data sets, and to leverage this to understand how and why people use services, as well as their anticipated needs and intent.

Telefonica has announced a cross-platform, AI-powered virtual assistant called Aura, which will carry out a wide range of functions including customer care, device management, security, product/service recommendations, and information. Aura will also support what Telefonica calls a "personal data space," which will store the digital trace that a user leaves when interacting with Telefonica services and allow customers to personalize their experience. Orange has announced a similar offering called Djingo.

How AI can help CSPs transform marketing engagement

The challenge: marketing engagement is disjointed

Today's consumers engage with service providers and brands across multiple channels (e.g. websites, email, social media, messaging platforms, mobile apps) and yet marketing interactions with customers lack integration and are typically specific to a single channel and usually based on static segmentation. Interactions with customers will become even more complex and demanding going forward as potential touchpoints – wearable devices and technology, smart TVs, connected cars, and household appliances – proliferate. CSPs not only have to engage in a personalized, consistent way with consumers across multiple channels, but must also determine marketing attribution across the different touchpoints.

The solution: supporting the all bound customer journey

AI solutions are data-driven and can provide a fully contextual view of customers in real-time, meaning AI can enable adaptive, personalized marketing across multiple channels in an integrated manner. AI ensures the customer journey is automatically tuned, is interactive, and is continuously evolving, with integrated feedback collection. This enables more targeted, contextually relevant customer interactions. This will in turn improve customer satisfaction (as evidenced with higher net promoter scores), and will also make upselling and cross-selling across different channels more effective.

The challenge: recommendations, upselling, and cross-selling are missing the mark

Recommendations, upselling, and cross-selling are closely related activities that in the communications sector are unsophisticated and often poorly executed, and as a result are ineffective. These activities are typically based on high-level demographic segmentations with limited insights into subscriber network and service usage, and equally limited insights into information about customer interests and intent. Recommendations are usually based on past actions rather than future needs and intent; for example, product bundles are defined by historic packages with little reference to existing performance. Marketers are operating in the dark, with little insight as to how customer decisions can be influenced by the right bundles and prices. Another problem arises when solutions are unable to integrate the content and outcome of previous marketing interactions with ongoing conversations. The net result of all these shortcomings is that recommendations, upselling, and cross-selling are poorly targeted and not relevant or compelling for customers.

The solution: contextual insights for deeper personalization and targeting

AI systems have access to a wealth of data and can analyze it to enable marketers to make better decisions. AI solutions can combine first-party and third-party data to better understand customers' needs, preferences, and interests. AI algorithms can combine historic patterns and behavior (plus "look alike" patterns) with ongoing real-time engagement to provide the right next best action to the customer at the right time and in the right context of their journey. The outcome for the consumer will be recommendations and offers that are personalized, well targeted, and relevant. The result for the CSP will be an increase in revenues and ARPU. Figure 5 is a vignette showing how this has worked for a CSP in the context of data bundles.

The challenge: customer offering data is scattered

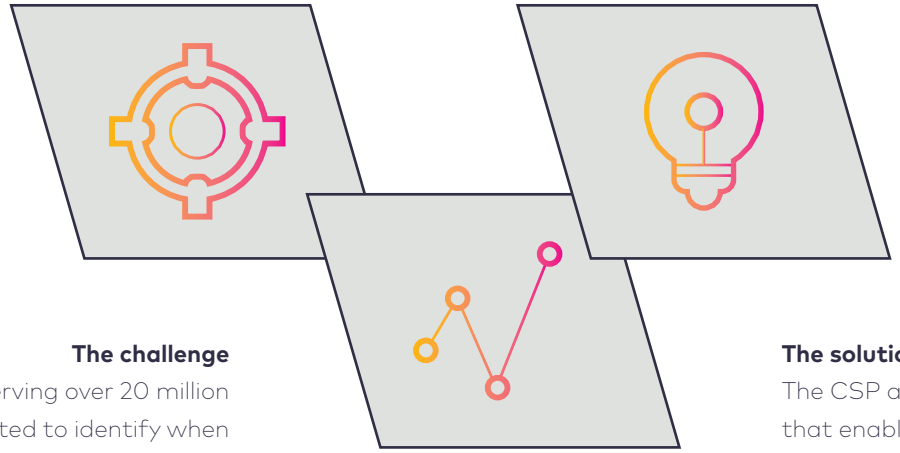
Data about the performance of product and service offerings is scattered across distributed systems, meaning there is no one single view of customers or any easy way for marketers to gain a historical perspective. Marketers are in effect acting in the dark when building the most important asset of the CSP: customer offerings, bundles, and promotions. Instead of being able to focus on innovation, they are burdened with operational tasks to generate data insight.

The solution: AI from the bottom up to power an intelligent catalog

Catalog data must be constantly tracked and analyzed to circle back and highlight the best options for the marketer when defining customer offerings, applying discounts, setting prices, bundling services, or terminating customer plans. AI should broaden the marketer's view, offer comparison to past data, offer analysis of performance versus targets, identify trends, and monetize the BSS system's data.

Catalog AI will highlight the right channels and segments and assist with pricing recommendations and the best period of time to exceed targets.

Catalog-driven intelligence ensures that no matter which campaign system the CSP uses, customer offerings performance data is documented in one place and is available to be analyzed to assist with the constant business optimization the marketer is accountable for: one single place of data, one single view of marketing BI – an engine for marketing intelligence.



The challenge

A tier 1 CSP, serving over 20 million customers, wanted to identify when customers were about to use up their data bundle allowance so that it could provide timely and relevant offers to boost usage and revenues.

The CSP used to approach this task by sending generic communications to all users. Conversion rates left much to be desired.

The outcome

Response rates and purchases of bundles have grown by 250%

Out-of-bundle revenue has increased by over 10%!

The solution

The CSP adopted a solution that enables automatic, proactive, personalized offers based on a customer's individual needs. The system identifies when a customer is about to finish the data in their plan and cross-references this with strategic customer insights, including usage and past behavior.

Figure 5: Intelligence in action – personalized data plan bundles

Source: Amdocs/Ovum

Recommendations

Act now or be left behind

Personalization in the hands of CSPs is a blunt instrument, which is dangerous when OTT service providers are upping the ante on the personalization front and raising consumer expectations. This is particularly noticeable with increasingly fine-tuned recommendations provided by music streaming services such as Spotify and Pandora. CSPs need to improve their game or risk being left behind.

Seek out solutions that support a horizontal approach

The traditional approach to analytics is based on vertical, and often siloed implementations that address specific use cases. The most effective AI platforms will be those that can access multiple data streams in real-time to produce intelligence that can feed into and enhance cross-domain business processes. This enables integrated, joined-up outcomes – for example, leveraging user behavior and engagement data across different parameters to fine-tune the product catalog offerings and make tailored recommendations.

Opportunities for intelligent agents beyond customer care

There is a strong and immediate use case for AI-powered intelligent agents in the customer care domain, as we will explore in the next chapter. But intelligent agents can also play a compelling part in broader marketing activities of CSPs. The interactive, personalized forms of engagement enabled by intelligent agents are perfectly suited for service recommendations, cross-selling, and upselling. Telefonica and Orange have both announced AI-powered virtual assistants that support a wide range of marketing and customer care functions.

Use AI to fine-tune the product catalog

AI can fine-tune the product catalog like never before. AI can propose the optimal price, content, size, validity, or other parameters of a product catalog entry and configure it based on analysis of available data such as competitor analysis, advertising, customer feedback, and BSS data. This intelligence in action empowers the marketing team to build personalized customer offerings. Once proven, this whole process can be automated to scale out.

Major on data privacy

AI can leverage very granular consumer data insights, with an understanding both of how and why people use services and of their anticipated needs and intent. These capabilities will accelerate and deepen going forward, enabling AI systems to become highly efficient profiling tools. This can benefit both consumers and CSPs, as seen in this paper, but data privacy in the AI context is already attracting attention and this will intensify going forward. CSPs should be proactive and visible in demonstrating how their AI solutions safeguard data privacy, building a reputation for trust that can act as a point of differentiation.

intelligent customer care

CSPs need to redefine customer care

Traditional approaches are falling short of the mark

Delivering a customer care experience that is satisfying for customers and is cost-effective is hard to get right, but it is critical. Customer care is an important part of a CSPs value proposition, and when it is high quality, it can have a positive impact on loyalty and brand equity. Conversely, a poor customer care experience can damage a customer's relationship with a CSP and, in the worst case scenario, contribute to churn. The net result is a hit on the CSPs bottom line.

Satisfaction with customer care in the communications market often falls behind other sectors. The UK Institute of Customer Service runs an ongoing UK Customer Satisfaction Index (UKCSI) across 13 sectors, and in January 2017 once again reported that telecoms was the lowest-ranked sector for overall customer satisfaction. The American Customer Satisfaction Index (ACSI) tracks customer satisfaction levels across 10 sectors, and in March 2017 assigned the lowest ranking to telecoms and information.

Complexity will increase, along with customer expectations

CSP are rolling out new technologies (e.g. 5G) and increasingly sophisticated services (e.g. connected home services) which, although beneficial to consumers, can introduce more complexity for them, particularly when new. This places additional pressure on traditional customer care resources and processes.

At the same time, consumer expectations of customer care are changing and becoming more demanding, driven in large part by millennials and, going forward, by Generation Z consumers. They are constantly connected and inhabit an online environment where events happen in real-time without them having to wait. According to the IBM Millennials Customer Survey 2016, 33% of millennials are only willing to wait 1–3 minutes to get a response for a customer care request. Conversely, these are exactly the demographic that are most open to the new, improved customer care scenarios that AI enables.

Intelligent agents can take customer care to the next level

AI-powered intelligent agents in the form of online virtual assistants, device-based digital assistants, and chatbots on messaging platforms can greatly enhance personalization. The deep data insights generated by intelligent agents combined with a conversational interface enable a highly interactive, personalized form of engagement with consumers. Intelligent agents can support one-to-one automated conversations with consumers at scale. Intelligent agents also have the ability to tap into and create very detailed consumer data sets and to leverage them to understand how and why people use services and what their anticipated needs and intent are.

Cognitive abilities are core

CSPs should seek out virtual assistant and chatbot platforms that have true cognitive abilities powered by machine learning. These agents and chatbots can engage in much more complex, personalized conversations (e.g. open-ended questions, the ability to detect emotional states) and can learn from interacting with customers. This is in contrast to agents that are rules-based and programmed to act on predefined commands in narrow scenarios.

How AI can help CSPs transform customer care

The challenge: traditional customer care is reactive, narrowly defined, and impersonal

There are several reasons why customer care in the telecoms sector is falling short of the mark. It is typically reactive rather than proactive and based on a complex CRM interface that uses predefined responses tied to narrowly defined scenarios. At the same time, agents often have limited access to actionable customer data, and without a contextual view of the customer there is little scope to provide a personalized response.

Service providers are trying to make customer care more efficient – and cost-effective – through digital self-service models. This can be highly effective when well executed, but the dominant approach based on automated interactive voice response (IVR) systems is impersonal, cumbersome, and frustrating for customers and contributes to dissatisfaction levels.

The solution: preemptive, personalized customer care

AI customer care solutions can leverage and process huge amounts of CSP customer data points and indicators, using them to predict pain points and address them with actions tailored to a particular customer's needs – before they escalate. For example, a large portion of customer care calls relate to billing queries. AI-powered customer care can be used to predict customers at risk of having a higher than average monthly bill, and to respond by letting customers know this is happening and recommend steps to avoid it, which could include migrating to a more generous data plan. Proactive, intelligent actions of this kind reduce costs by preempting calls to customer care while also introducing an element of personalized upselling.

The solution: AI-guided assistance for agents in real-time

AI can be used to support and guide customer service agents in real-time, to the benefit of both the agent and the customer. Machine learning enables a deeper, contextual view of customers that can be used to help agents better predict customer behavior during conversations, and also to provide best-fit solutions to the particular issue raised by a customer, making the whole experience proactive rather than reactive and script-based. More specifically, AI-based solutions can do the following:

- Display customer intent to an agent based on previous interactions.
- Guide the agent with actionable data including churn indicator, access to knowledge, external content, and contextual experience.
- Recommend real-time next best actions and offers within the CRM for guided upsell and cross-sell opportunities.

The challenge: traditional customer care is expensive

Customer care services are a significant cost center. According to Amdocs, the average cost of a customer call to a CSP is $8–10 per call, and the repeat-call industry average is currently about 24%.

The solution: intelligent agents increase efficiency and reduce costs

AI-powered online virtual assistants and chatbots on messaging platforms can conduct multiple concurrent conversations at scale, helping CSPs save time and money compared to more traditional customer support channels like call centers. AI-powered virtual agents with cognitive abilities can automate some of the roles currently performed by human agents. For example, online virtual assistants could be used to handle level-one requests and FAQs outright, while passing more complex matters to AI-assisted human agents. Several CSPs, including Optus, Telefonica, AT&T, and SK Telecom, already have online virtual assistants to support frontline customer care. Moreover, intelligent agents that leverage machine learning will become more autonomous over time.

Machine learning systems are self-learning and become smarter with exposure, meaning that the more intelligent agents interact with data and customers, the better their ability to perform a greater range of more complex tasks. At the same time, deep learning is reaching a level of sophistication where it can be used to assess a person's emotional state using visual and voice cues, which will dramatically enhance the ability of intelligent agents to support customers.

Recommendations

Customer care is an investment priority – make sure AI is part of the solution

Ovum's 2016–17 ICT Enterprise Insights survey revealed that digital customer self-service is a top-priority IT project for CSPs, second only to network performance management and optimization. Digital self-service is also the area where CSPs expect to see the most investment, with just over a quarter of respondents anticipating that spend would increase by 6% or above. Given the benefits that AI-driven automation can bring to digital self-service, as explored in this chapter, it makes good business sense to invest in customer care platforms with strong AI capabilities.

Look to solutions with CSP domain knowledge and processes expertise

CSPs should seek out AI solutions with cognitive engines that are optimized for their industry domain and business processes. AI-powered virtual agents and chatbots must be able to answer questions and make predictions based on industry-specific information and requirements. Without this, an intelligent agent cannot do its job effectively.

Provide support for conversational intelligence

CSPs should enable customer interactions via an intelligent conversational interface, leveraging natural language processing and advanced speech recognition. This form of AI-powered human-machine interface is increasingly popular with consumers and plays a central role in next-generation customer care, supporting personalized interactions with customers.

Enable seamless handover to human assistants

Intelligent agents have not yet reached the stage where they are 100% automated, and this will not happen for several years. There will be times when even the smartest virtual assistants and chatbots need to pass queries to human-assisted channels, and it is therefore important to have solutions that can support this.

from data to intelligence

Data fuels AI automation

Data has long been understood to be the source for developing insights about a business's operations, its customers, and its prospects. The role it plays in enabling AI to achieve expectations is just as critical, because data is the measure of what the organization is doing, how effectively and efficiently it is conducting that business, and how it might make changes to improve performance. In each example of AI use given in this paper, these data measures are the source for building, training, and constantly improving the algorithms which power the AI capabilities that enable automation.

The challenge for CSPs is in sourcing that data, ensuring it is both valid and of sufficient quality, and combining it into a format to use as a source for AI. A frequently drawn and apt analogy is with oil; it is both costly and time consuming to locate and extract, and it must also be refined prior to being useful.

Harnessing the power of data is critical to digital transformation

Real time (or close to it) lies at the heart of digital transformation. AI-powered automation is needed because human interaction or intervention may simply not be possible due to the speed, scale, or complexity of the data that needs to be observed, analyzed, and acted upon. That data is what allows a machine to understand the situation, assess a range of options based on available information, and select an action or response based on probability of best outcome. In other words, digital transformation requires automation, automation means investing in AI capabilities, and AI needs access to vast quantities, and different types, of data – in real-time.

Data science is a necessary enabler of AI

The traditional approaches to data management in organizations have proven insufficient to handle both the new and unfamiliar data types now available and the twin challenges of scale and speed. To source, store, and integrate these different data types demands new investments in big data technologies, like Hadoop and its ecosystem of supporting capabilities. To make sense of that data, once captured, CSPs must reach beyond traditional analytics and either develop or acquire data science skills.

Data science can be thought of as the evolution of analytics, and brings together technology, statistics, and advanced data management/manipulation, and – critically – to be successful it requires deep understanding of the industry in question. Its relevance to enabling AI is not just the ability to interpret and contextualize large-scale data, it is the introduction of scientific rigor to the process of developing the algorithms that power AI capabilities. In practical terms, that translates to hypothesize, test, discard/proceed, monitor, and improve – continuously. This is one of the key benefits of applying machine-learning-powered AI, the implementation of a continuous, data-driven cycle of optimization, to the processes that operate the business.

Business context is essential for unearthing insight

AI brings its own unique challenges to data, particularly the importance of business context. Business context is the understanding and experience within an organization that helps it identify the most compelling and relevant data insights. When industry and organization-specific business context is applied to data it transforms it from being an interesting indicator, to actionable, value-adding intelligence. It is that intelligence that powers the AI capabilities which drive the automation at the heart of successful digital transformation.

Business context is an important factor in data validation, an emerging concept that is superseding traditional data quality. While data quality is essentially binary – the data is either wrong or right – data validation is concerned with the relevance, and therefore the value, of the data. Without deep understanding of the industry and the business context that understanding provides, data validation becomes infinitely harder to achieve.

Predictive models are enabled by business context

Another important contribution made by business context is the role it can play in developing predictive capabilities that are another facet of AI. Predictive analysis depends on historical data and provides an important augmentation of AI, allowing, for example, the automation of predicting customer churn. To achieve this means applying that in-depth industry knowledge to those historical data sets, and understanding the indicators in the data that point to a particular outcome, usually an approaching problem. If these indicators can be identified, documented, and baked into predictive AI, the system can proactively monitor for like signals in real-time data streams, and afford the possibility of preventative action rather than post-issue repair – for example, predicting when an area of network coverage will experience capacity problems that could negatively impact service levels for customers. This could be predicted by combing data sets (current capacity, new subscribers, and addresses) and understanding the indicators from examples in the past where this has happened.

Towards a 3D view of customers

The challenge: CSPs have a fragmented view of customers

The ultimate objective of CSPs is to draw on data assets to achieve a fully contextual view of their customers. But the reality is that the majority of CSPs have yet to achieve this goal. CSP data is not typically integrated at a deep level, but instead scattered across operational units in information silos. These different data sets can vary widely in terms of quality and depth, which in turn raises questions about just how actionable those data sets are. The net result is a highly fragmented 2D view of customers.

The solution: an intelligent 360-degree proposition

CSPs have access to a wide range of first-party data from their own systems, which can be powerful. But to gain a fully contextual, 360-degree view of customers, CSPs need to extract actionable insights from first-party data and combine it with actionable third-party data from social media and other sources, as illustrated in Figure 6. It is clear from the analysis in the chapter that AI-powered solutions improve with exposure to data, which in turn enhances data intelligence – a virtuous circle in action. AI-powered solutions that can integrate first- and third-party data will maximize the ability of CSPs to achieve a genuine 360-degree view of customers. This in turn informs and guides the processes that will optimize the customer experience while simultaneously making the interaction as effective and efficient as possible. This includes everything from avoiding repetition or rekeying of information to viewing customer history, establishing context, and initiating desired actions.

360-degree view of your customers

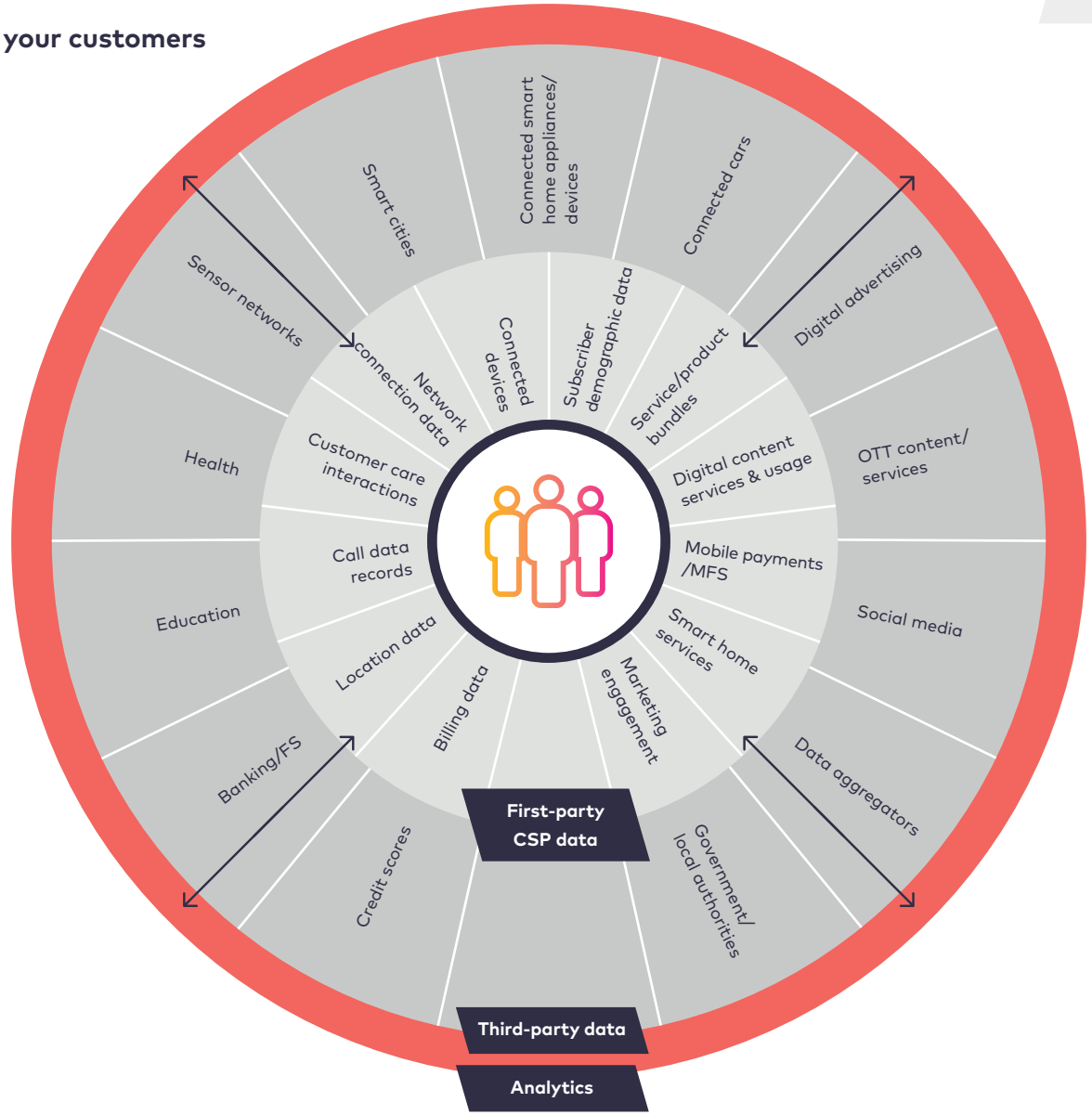


Figure 6: The proliferating range of first-party and third-party data

Source: Ovum

Recommendations

Understand what data is available and its relevance to AI opportunities

Exploring what data sources are available to an organization means not just looking at new sources, but also reexamining the existing applications and systems around the business, including product catalog data. It can also include external sources from data partners who sell access to data sets, or partners who engage in data sharing for mutual benefit.

Use business context and data science to enable data validation

Engaging with the wider business is critically important to generate as much business context as possible through which to view available data. Do not limit efforts to well-understood areas like IT, networking, and finance – include more novel areas like customer service, marketing, and sales; they contain customer insights that might otherwise be missed. Working with third parties will help broaden the context and bring experience that, although relevant, may not exist in the organization.

Evolve the data architecture to acquire, store, and manage new data types

CSPs have major existing investments in their data capabilities; these need to be extended to handle the scale, variability, and speed that comes with new data types. This will likely mean new big data capabilities that are able to both ingest and store the data and integrate multiple data sets. In many cases, placing these new capabilities in the cloud or another managed service can offer benefits, allowing the flexible scaling of technology without impacting the existing architecture.

Integrate multiple data insights and unify customer profiles

CSPs should look to solutions that enable them to fuse a wide variety of first-party data with third-party data in real-time to provide a single unified view of the customer. This is the foundation for intelligent customer interactions in marketing and customer care.

the intelligence in action checklist

CSPs need to achieve long-term differentiation in a climate where they face increasing competition across the board from smart, fast-moving OTT and consumer tech players. This paper has shown how AI can help CSPs optimize their market position and impact. AI solutions can drive value across the CSP business, from network optimization and data analytics through to marketing engagement and customer care. CSPs must move quickly to embrace AI or risk being left behind. This is of course no easy task, but this paper provides an in-depth roadmap to help CSPs on their journey. The starting point is to tackle the big strategic issues; that involves an assessment of the organization's capabilities, sourcing the best AI solutions, and managing the AI lifecycle, as analyzed in the first chapter of this report. There are then a host of urgent, associated questions that need to be addressed if CSPs are to maximize the AI opportunity. These have likewise all been detailed in this report, but to ensure none have been missed, we offer a final AI checklist, as shown in Figure 7 below.

Build and intelligent product catalog	AI can propose the optimal price, content, size, validity, or other parameters of a product catalog
Support the all bound customer journey	AI enables adaptive, personalized marketing across multiple channels in an integrated manner
Leverage contextual insights for deeper personalization and targeting	AI algorithms can combine historic patterns and behavior with ongoing real-time engagement to provide the right next best action to the customer
Be a data privacy champion	AI can leverage more granular customer data insights than ever before. Look to AI solutions that safeguard data privacy – build a reputation for trust
Make human agents more proactive and effective with AI-guided assistance	Machine learning enables a deeper, contextual view of customers that can be used to help agents better predict customer behavior during conversations in real-time
Use AI to reduce the costs of customer care	Virtual agents with cognitive abilities can automate some of the roles currently performed by human agents. AI-powered virtual assistants can conduct multiple concurrent conversations at scale, helping service providers save money
Implement solutions with domain knowledge and processes expertise	The most effective AI solutions are those with cognitive engines that are optimized for a service provider's industry domain and business processes
Ensure you have access to large pools of actionable, integrated data sets	Data fuels AI automation. Successful use of AI is dependent on access to data to build, train, and constantly improve the algorithms that power it
Make sure you integrate first- and third-party data	Look to solutions that are able to fuse a wide variety of your own data with third-party data in real-time to provide a single, fully contextual 360-degree view of the customer
Draw on horizontal solutions that optimize cross-domain value	The most effective AI platforms will be those that can access multiple data streams in real-time that produce intelligence that can feed into and enhance cross-domain business processes

Figure 7: CSP AI application optimization checklist

Source: Ovum

appendix

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