



WHITE PAPER | TELECOM, MEDIA & ENTERTAINMENT

# Managing the Next-Generation Telecom Digital Experience

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# Introduction

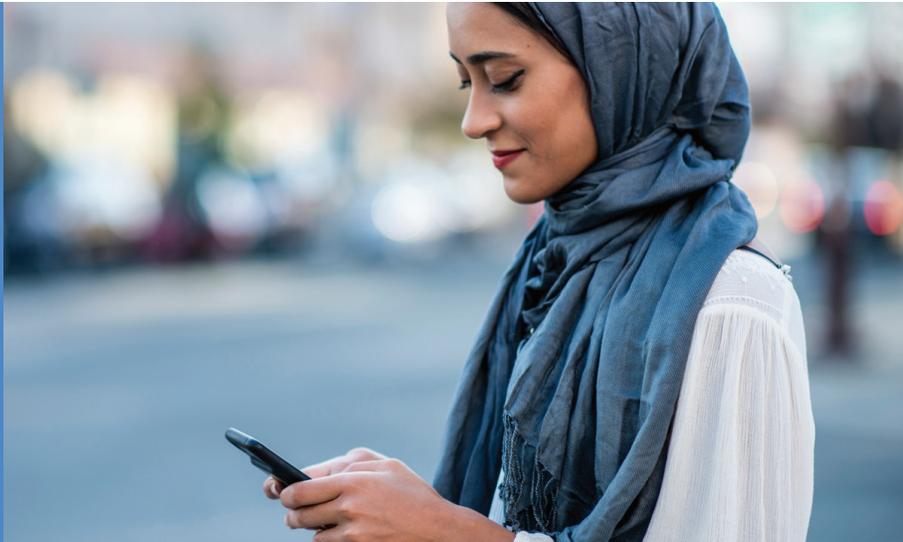
Telecom and media companies (telco providers) have access to vast amounts of data. This includes data gleaned from devices connected to their network infrastructure, call records, mobile phone sensors and set-top devices like digital video recorders. If managed appropriately, this data could provide unprecedented customer insights, allowing telcos to enhance the customer experience (CX) dramatically. These insights could potentially increase not only customer loyalty and revenue but also operational efficiency, driving down costs.

## However, to realize the data's potential requires overcoming key challenges:

Making data available when and where it's needed to those who can best use it to aid CX

Protecting the privacy of customer information while continuing to gain and add information to personalized, customer-centric profiles

Transforming data into actionable insights to create revenue and value for the company



And to do so is key to telco revenue growth, because when it comes to CX, delivering a poor experience puts over 9% of overall sales at risk for providers of bundled internet, TV (6.2%) and wireless services (2.9%) — see Figure 1.<sup>1</sup>



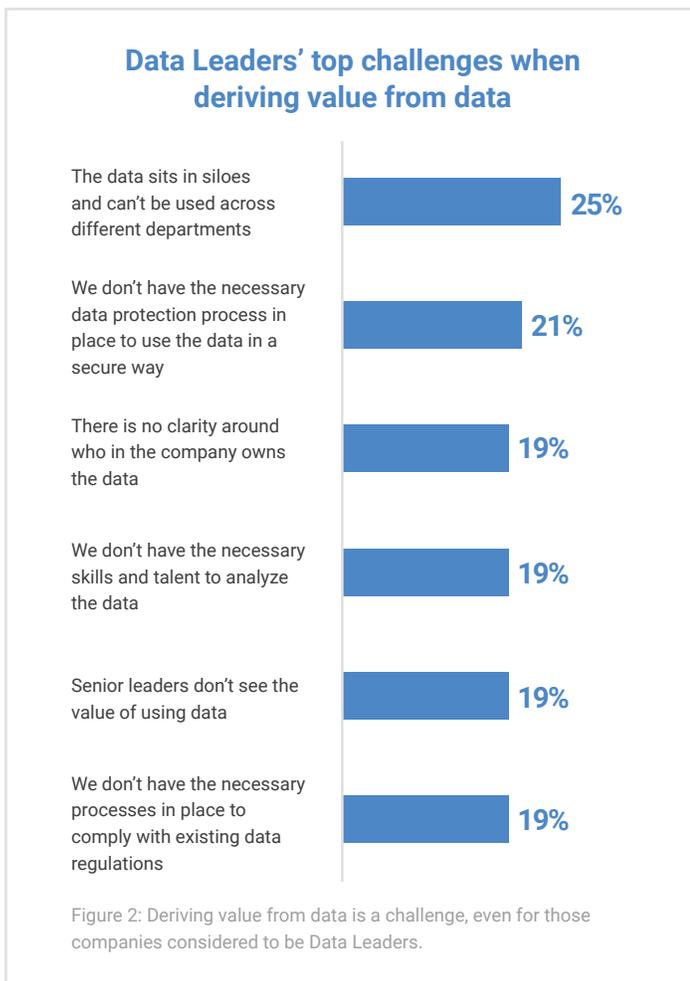
NTT DATA Services believes the solutions to these challenges lie at the intersection of data, artificial intelligence (AI), machine learning, analytics and edge computing technologies. This paper examines the challenges and the business outcomes that can result from leveraging these advanced technologies.

# Challenges in transforming data into actionable information

## Overcoming data silos

Like most companies, telcos see enhancing CX as a top priority. The available customer data is exceptionally deep and varied, and – in principle – could yield significant insights into customers’ habits and preferences. However, because the data comes from disparate sources, it’s effectively siloed. This disconnect inhibits holistic analysis.

In an early 2020 survey by NTT DATA and Longitude, a full quarter of the industry respondents considered to be Data Leaders said they’re still contending with data sitting in silos and are incapable of using data across different departments – and those are the leaders (see Figure 2).<sup>2</sup>



## Ensuring data privacy while personalizing

Telcos possess both a tremendous volume and a great variety of data. A particularly valuable source is information from network cell towers, which can indicate whether a customer is receiving one bar or five bars of service or no service at all. Signal strength is a primary CX consideration. Customer movement, individually and in aggregate, can also be used to enhance a wide variety of services. However, data from network towers is not always captured and is difficult to associate with traditional customer profile information. Not only is it a technical challenge to connect the structured data with unstructured data but, in some circumstances, it can be considered a privacy violation. Network data can track individuals and provide their whereabouts at any time – information that can be disastrous in the wrong hands.

Protecting this highly sensitive data from loss or misuse is one of the challenges telcos face in providing a superior customer experience.

Personalization consists of tailoring a service or a product to accommodate specific individuals. It can also be tied to groups or segments of individuals.

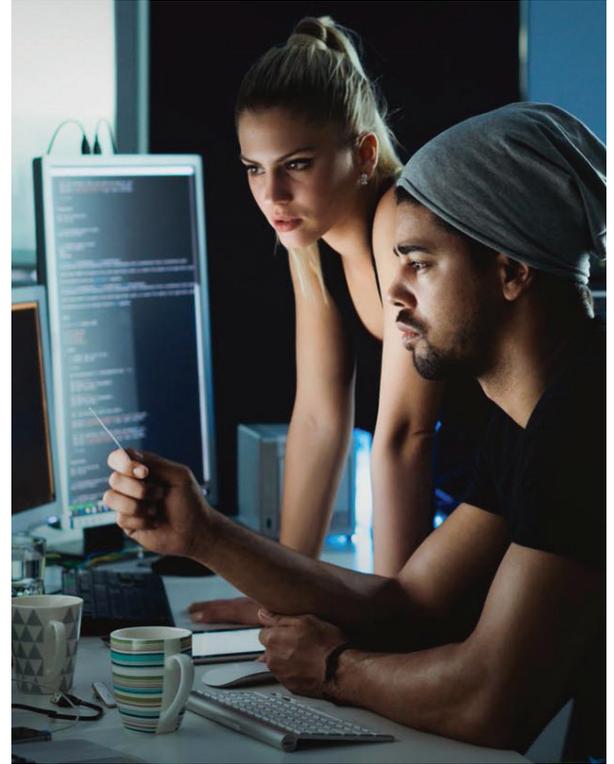
Until now, personalization has come at the cost of individual privacy, some of which is lost to these capabilities. When customers click on a website, they often give away their right to the information they've provided without reading the text. They either opt-in or opt-out for messaging from a company.

In a May 2019 article, Rob van den Dam, Global Telecommunications Leader at IBM's Institute for Business Value, wrote: "The truth is that privacy has been under assault in the digital age for some time. Until recently, though, it just didn't seem to bother a lot of people. One big reason: free stuff. For the price of a smartphone, consumers could access a previously unimaginable array of new apps, content providers and digital services — all without paying. The social networking revolution epitomized by Facebook and Twitter has been predicated on a free experience. Google's search, maps, email — all of it has been accessible to everyone, free of charge."<sup>3</sup>

New rules and regulations regarding this process make it more difficult for companies to acquire and use email addresses, private mobile phone numbers and other forms of contact with individuals.

However, without good data, personalization is impossible.

Addressing this privacy and personalization balance requires establishing a privacy-respecting solution that enables data delivery of all transactions at key touchpoints, including network tower transactions, while maintaining privacy and allowing for personalization through new technologies.



### Comparison of Worldwide Privacy Laws<sup>4</sup>

	General Data Protection Regulation (GDPR)	Lei Geral de Proteção de Dados (LGPD)	California Consumer Privacy Act (CCPA)
<b>Territory</b>	EU	Brazil	California
<b>Data activities covered</b>	Processing EU personal data whether it exists in the EU or not	Processing Brazilian personal data whether it exists in Brazil or not	Processing California resident data from any California for-profit
<b>Businesses that must comply</b>	Any party that processes personal data from any EU citizen whether in the EU or not. Almost all businesses must comply	Any party that processes personal data from any Brazilian citizen whether in Brazil or not. Almost all businesses must comply	For-profits that have \$25 million or more in gross revenues, process personally identifiable information from more than 50,000 customers and receive 50% or more of their profits from selling California residents' information
<b>Personal data definition</b>	Information that can be reasonably linked (directly or indirectly) to identifiable or identified data subjects	Data related directly or indirectly to an identified or identifiable natural person	Any information that can be used to identify a consumer or household

## Comparison of Worldwide Privacy Laws (cont'd)<sup>4</sup>

	General Data Protection Regulation (GDPR)	Lei Geral de Proteção de Dados (LGPD)	California Consumer Privacy Act (CCPA)
<b>Examples of personal data</b>	Names, social security numbers, addresses and characteristics that express the physical, physiological, genetic, mental, commercial, cultural or social identity of subjects	Not explicitly defined	Social security numbers, addresses, biometric information, internet/network activity data, geolocation data, etc.
<b>Covers publicly available data</b>	Yes	Not explicitly defined	No
<b>Must hire data protection officers</b>	Yes	Yes	Not specified
<b>How is pseudonymous, de-identified, aggregated data</b>	Considered personal data	Not explicitly defined	Allows collection, retention and sale
<b>Data processing is allowed only for these reasons</b>	Explicit consent, legal responsibility, vital interest or contractual performance	Consent, legal obligation, life protection, exercise of privileges in legal proceedings, legitimate interest, credit protection, health protection, public task, research	Residents can opt-out of having data processed or sold
<b>Individual data access rights</b>	Yes	Yes	Yes, but limited to how data is collected and used
<b>Process for requesting access to data</b>	Electronically or orally	Not specified	Toll-free number or webpage
<b>Timeframes for delivering data</b>	30 days	15 days	45 days
<b>Consumer has the right to be forgotten</b>	Yes	Yes	Yes
<b>Fines/penalties</b>	20 million euros or 4% of annual global revenue	2% of annual global revenue, up to 50 million reais	\$2,500 for each violation and \$7,500 for each intentional

## Leveraging advanced analytics

Orchestrating the flow of data and information from customer touchpoint to touchpoint can be challenging, but it's key to enhancing overall CX. For example:

- By leveraging data from multiple sources, telcos can fully realize the potential of their data. So, for example, when data is aggregated, telcos will have the opportunity to enrich the customer experience. And, by producing a digital twin of network device connections and coupling it with customer records in a designated geography, telcos can notify customers about areas with low reception or potential disruptions before service falters or warn them of impending safety issues.
- By analyzing sensor data locally on the mobile handset, telcos can not only put customers in control of their own data but also derive value from it while still maintaining customer privacy. Providers could, for example, allow customers to pull information to their phones instead of having advertisers push it. This could help telcos avoid issues associated with privacy laws, which vary by country, and position carriers as a champion for consumer privacy. Critically, it could also provide telcos with a new source of revenue from advertisers.
- By analyzing call detail records, creating profiles and continuously adding information to those profiles as data flows through internal systems, telcos can use this information to engage customers quickly and efficiently at key touchpoints, such as call centers, retail stores, websites or areas where customers stream content. All touchpoint management has one goal in mind – keep customers engaged to retain and improve the revenue stream.
- By combining all transactional information, customer activity and enriched analytics, telcos have the ability to develop digital human interfaces that can react at key touch points across the customer journey. For example, digital humans can be employed to manage in touchless retail situations.

These options for handling customer interactions are highly dependent on being able to create, enrich and manage a customer profile. As each interaction enhances the profile, systems must make explicit choices to either pass on information to the next CX step, retain the information for the next customer interaction at that same point or both.

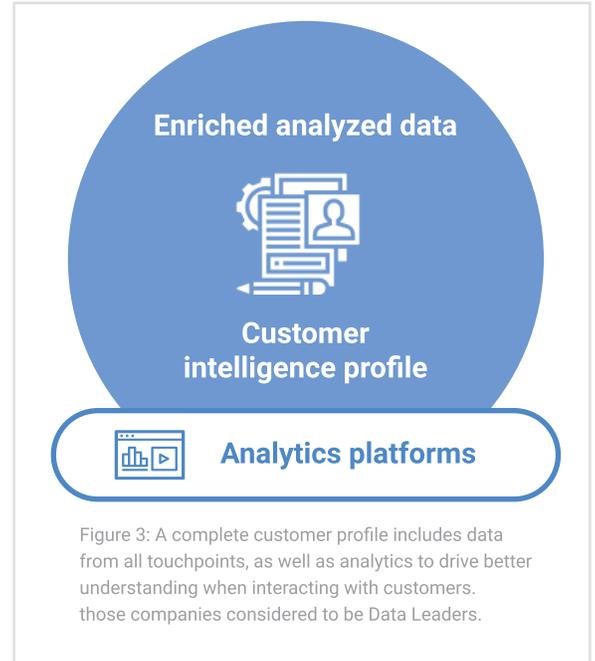


Figure 3: A complete customer profile includes data from all touchpoints, as well as analytics to drive better understanding when interacting with customers. Those companies considered to be Data Leaders.



## How advanced technologies can help

Telcos can take advantage of several new and emerging technologies to help create better, more valuable customer interactions.

### The role of AI and machine learning

AI and machine learning can play an important role in turning customers into brand advocates. For example, AI-based personal assistants in call centers or retail stores can respond to simple questions quickly, meeting a customer's needs in real time – a great first step in creating

an enhanced customer experience. These assistants can also direct inquiries that require human intervention to the appropriate resource, as well as assimilate the customer's mood into the interaction. A detected tone of voice, for example, may indicate the customer needs to be referred to a supervisor instead of a regular agent.

Because AI is most effective when it augments human behavior, and can in some cases replace human labor, these personal assistants can help offload simple interactions from overworked call center agents. They can also be used to greet and direct customers in retail stores — often the most overlooked but important action in retail.

Telcos can use digital twin technology to take advantage of the extensive, and rapidly changing, information their networks provide, such as geolocation data gathered via the GIS sensors in customers' mobile phones. The digital twin technology can be applied to create twins of network-attached devices that react to changes at the endpoints of the network and rapidly communicate those changes back to the customer profile to ensure that customers can be updated immediately on service outages or security issues



Digital twin technology entered the IT lexicon with the internet of things. By creating virtual replicas of physical devices, such as refrigerators, generators or airplanes, scientists and IT professionals could run simulations before actual devices are built and deployed.

The technology is most commonly used in manufacturing to evaluate changes to production lines or simulate the wear of machine parts to predict timeframes for failures.

Digital twins also can be replicas of living entities, such as the human body or the human psyche. These human digital twins can be used to evaluate how human systems might react to processes such as surgery, encounters such as marketing stimuli or devices such as pharmaceuticals.

NTT DATA has invested \$320 million in digital human twin development. The goal is to develop a digital twin of the human body to be able to test new medications and treatments for humans.

### Human Digital Twins Enable Next-Generation Modeling

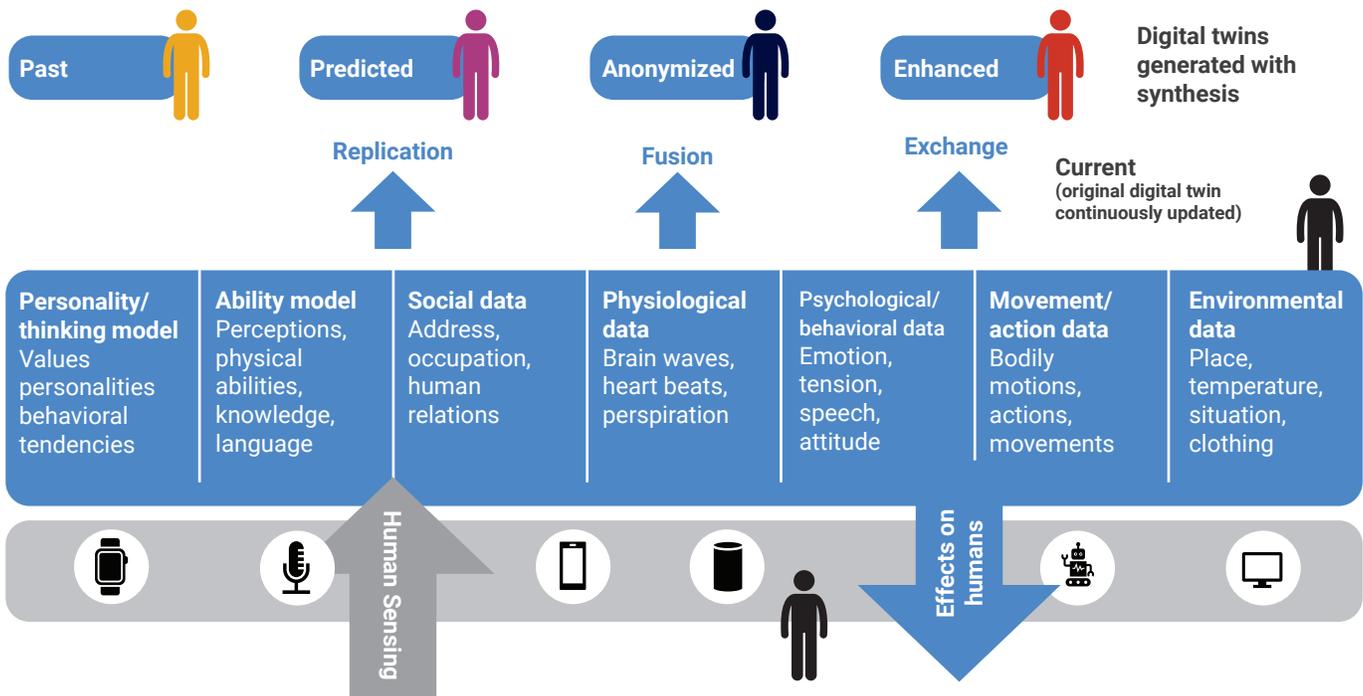


Figure 4: Leverage human digital twin technology to create better customer experiences.<sup>5</sup>

## Edge computing

Once a telco succeeds in deriving actionable insights from its data, the next challenge is ensuring the insights are available where needed. This entails developing solutions that enable delivery of relevant information to the right person, when that person is most likely to need it, in an appropriate and useful format.

In a call center environment, for example, representatives typically have access to a traditional data set such as billing records. But a representative could be more effective by also having data elements gathered from other systems with which the customer interacts. These might include data from websites, streaming services and network towers. The proactive use of analytics can help telcos better understand customer behavior and target that behavior with the right offer at the right time throughout the customer journey.

New technologies and the capability to put analytics and information at the edge of the computing environment can help. Forrester Research describes edge computing as “endpoint and endpoint-enablement resources that manage and analyze localized data and empower near-real-time insights, engagement and automation within physical proximity to endpoint devices and customers. These include edge management and intelligence software that runs on or near endpoint devices (IoT, mobile, etc.) so its actions can be completed immediately.”<sup>6</sup>

The “edge” of a customer journey often includes devices or points such as the call center agent’s screen, the network tower, or the customer’s in-home television screen or mobile phone.

For example, for each visiting customer, the telco’s website might dynamically configure an offering specific to that customer. Or, when a customer contacts the call center, the responding agent would have immediate access to information about that customer’s last interaction with the telco. Signals regarding outages from a cell tower might be combined and added to customers’ records so a text-message alert about an outage could be sent to all affected customers. And all this information could be analyzed and provided at the key touchpoint – at the edge.

With 5G technology coming soon for most telcos, edge computing will be enabled to run analyses faster at all these points of contact.

## Tracing the customer journey

A customer journey is a continuum from first engagement through use and renewal of a service. The journey can take the customer through various touchpoints, each of which represents an opportunity for the telco to delight and engage the customer. Each touchpoint should have information available for decision-making as well as collection to pass on to the next step in the process.



The customer's journey consists of key touchpoints where information is exchanged between the customer and the telco. Each of these touchpoints makes a unique contribution to an understanding of how best to attract, keep and grow the telco's customer base. Here are some of key points of customer data capture that contribute to a rich and complete customer profile:



**Marketing analytics** begins the process by using data gleaned from both customer interactions and customer transactions. Analyzing marketing data helps telco providers understand who buys their services and the profitability of each customer. The customer profile starts with marketing.



**Web analytics** adds to marketing's understanding of how the customer would like to interact with the company. By analyzing customer traffic patterns on company websites and understanding where customers go for information, telcos add to the customer profile that marketing started.



Most likely, customers' first human interactions are through **call centers** that either provide presale information or post-sale support. Analyzing call center interactions further enriches customer profiles. This could include key information gleaned from marketing and web analytics, previous transactions and other third-party data that call center agents can use to understand better how to provide the best service to the customer. Analysts can use data from the call center agents to predict if and when customers will purchase.



Customers use various channels to interact with telco companies. Often, these companies have retail outlets that allow customers to see and evaluate telephony products. **Retail store** analytics can help customer service reps understand customer problems in advance of a visit, provide information on billing and allow the customer to explore options for various levels of service. Capturing these interactions and applying them to the customer profile further deepens the telco's understanding of a customer.



**External data** sources can provide companies with a view of how the customer interacts with other providers or competitors. These sources can also provide strategic data, such as a customer's credit rating, which can enrich the interactions at other touchpoints.



One of the datasets that few companies include in a customer profile is the **network carrier** data that each network tower generates. Analyzing this data can help service personnel better serve customers when issues such as lack of coverage or interruptions in service occur. Knowing when and how these issues arose helps the telco provide better CX.



One of the latest services telecom provides are those that **stream**. Video streaming services are attached to each customer profile and can provide information about these services as well as analytics associated with the usage of the services. This can enrich a customer profile and create actionable insights for not only call center agents, but also retail store personnel, marketing, and web managers.



Using information from a customer's **mobile phone** sensors and applications can help marketing determine not only what would be a customer's next best action but also when and where that action might take place. Technology is available today that understands how best to handle this sensitive information for both personalization and privacy and can ensure that it is best used for the customer.

Telcos can use these and other touchpoints for data capture and analytics to provide an enhanced experience to their customers.

# NTT DATA solutions

Getting information to each point of contact so it can be used to help manage customer interactions and further customer experiences is the key to the NTT DATA Telcom Digital Experience.

Built on the core technology used in our next-generation tools, Telecom Digital Experience takes advantage of capabilities built by NTT DATA in support of clients worldwide. This data intelligence fabric serves as the basis of the platform, which pulls together the industry's best tools in a cloud-agnostic environment.

Telcom Digital Experience aims to:

- Combine data from marketing interactions and transactions, as well as network infrastructure and mobile phones to help manage each customer interaction.
- Create a dynamic customer profile and a model of the customer journey that can be built and augmented with every interaction.
- Develop analyses and analytics models at key touchpoints that enable a better understanding of the value of the customer interaction and report on the additional information gained with each interaction.
- Use human digital twin and digital twin technology to humanize interactions instantaneously at all key touchpoints.

Because the Telecom Digital Experience integrates with existing technology, clients do not start with a blank sheet. NTT DATA uses tools and capabilities to connect applications that help manage the entire data supply chain. It merely takes advantage of what's already part of the NTT DATA offering. The experience is designed to gather information for a customer profile that can be used throughout the customer journey. In addition to traditional data and analytics tools, NTT DATA has enlisted other partners and technologies to bring unique capabilities to the platform.

Next-generation marketing tools, for example, deliver analytics to key places at the beginning of the customer journey, such as marketing, websites and call centers. This capability delivers on the promise of the kernel of a customer profile that moves throughout the customer journey. Endpoint capability designed into mobile phones manages both personalization and privacy, and it shows the potential power of 5G. Combining analytics capabilities with geolocational sensors allows tools to contextualize offerings to the customer. These tools have both a profile of the customer and the knowledge of the context in which a certain person might have a need and therefore purchase. No data is exchanged between the mobile phone and the telco until the customer purchases a product online.

Easily incorporated into any brand's existing application, the Telecom Digital Experience provides a much fuller view of customers, not just information on what they're interested in but also when and where these customers might be open to the brand's message.

Our solutions draw on the expertise of a dedicated team of professionals to improve the customer experience by introducing innovative technologies and processes that deliver hard-dollar cost savings and soft-dollar productivity. NTT DATA helps clients achieve the highest level of user satisfaction while minimizing operational costs and transition risks.



## Offer Better Services Through Contextualized Offerings

*Like everything in life, it's all about timing.  
The right thing, at the right time and place, this is what a mindful moment feels like*



Figure 5: Contextual offerings make services better.<sup>7</sup>

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We're engaged with the following companies to support new technologies and apply innovative solutions to their technology environments:

- For a global telecommunications operator based in Spain, we're working on the robotic automation of processes using several leading technologies.
- For a telecommunications provider based in the United States, our intent-driven engagement with virtual agents and visual interactive voice response at the website uses AI and machine learning.
- For a telecommunications provider based in Italy, we've helped launch a low-cost mobile carrier. We developed online onboarding, home delivery and packaging, and an activation process via barcode scan and video. We also developed the capability to pay, collect and activate service at newsstands. The result is a net promoter score of +76 versus the industry average of +36.



# Conclusion

The next generation of customer experiences will be transformational, driven by customer insights created by the inflection point of emerging technologies and the variety and amount of data influencing customer interactions. Telcos need agility and responsiveness, as well as leading-edge tools that can be applied collaboratively across the enterprise. And they expect a partner that not only understands their environment and the industry but can also add to their vision innovative approaches that deliver scalability and flexibility. In short, telcos need a partner that can challenge, guide and deliver on the next generation of digital technologies that drive transformation.

For more information or to schedule a workshop to develop a proof of concept, contact:

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Visit [nttdataservices.com](https://nttdataservices.com) to learn more.

NTT DATA Services, a global digital business and IT services leader, is the largest business unit outside Japan of NTT DATA Corporation and part of NTT Group. With our consultative approach, we leverage deep industry expertise and leading-edge technologies powered by AI, automation and cloud to create practical and scalable solutions that contribute to society and help clients worldwide accelerate their digital journeys.

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