

Enterprise Case Study: Solving the Customer Experience Challenge

How DNA leveraged big data and analytics to enhance visibility into quality of service experience

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Summary

Catalyst

Delivering a personalized customer experience remains the top business challenge for communications service providers (CSPs). Ovum's 2017/18 ICT Enterprise Insights survey, conducted in 2017, indicates that over 90% of CSPs will prioritize solving the customer experience challenge over the next 18 months. Delivering a great personalized customer experience will require a view of what customers are doing at every point in time. However, this is challenging, as most CSPs have a large customer base, with customers consuming several services. They have little visibility into the experience delivered by the different applications and services consumed on the network. Consequently, it is difficult to identify when the customer is experiencing poor service quality and provide prompt remediation to identified issues. There is also huge demand from customers for CSPs to provide a good customer experience.

This case study highlights how Finnish operator DNA developed a customer experience management (CEM) solution in partnership with Ericsson. The CEM solution emphasizes the role that big data and analytics play in providing a view of the experience delivered to customers, and how to identify resolutions to issues that could negatively affect this experience.

Ovum view

To serve customers effectively, CSPs must have deep visibility into the quality of the services delivered, with a view to identifying any potential issues impacting the service and the possible resolutions as quickly as possible. Achieving this requires analyzing and correlating multiple data sources. With growing consumption of data services, data volume and the speed of growth of data will increase, and therefore investment in big data and analytics platforms is crucial to ensure that data from all possible sources is collected, stored, and analyzed, with key insights communicated in a way that is useful for the business.

The DNA–Ericsson engagement demonstrates that customer experience strategies must be a lifelong business priority. The experience needs to be constantly evaluated in order to ensure the continued delivery of a high-quality experience to customers. Most importantly, customer experience should not just be about the tools, but also about the people and the processes involved in delivering services to customers. While the digital economy makes the human touch less evident, employees are critical to improving the experience that customers receive. Ovum's Digital Consumer Insights survey, conducted in 2017, indicates that the third most popular reason customers would consider changing their CSP is to receive better customer experience. Therefore, CSPs must make sure that they provide their customer service agents with the right tools and environment to allow them to deliver the right experience. The value of customer experience projects can also be beneficial to employees from other parts of the business, such as marketing, product development, and strategy, as these functions impact the customer experience in one way or another.

Key messages

- The key objective for DNA and Ericsson was to improve customer experience by increasing agent visibility into customers' perception of service quality.

- Ericsson implemented its CEM solution based on its big data analytics product, Expert Analytics. Expert Analytics correlated data from multiple data sources and provided analytics insights to improve the problem resolution capabilities of customer service agents.
- The Expert Analytics solution has empowered DNA's care and operations teams (and other teams, such as strategy) to deliver operations aimed at improved customer experience.
- The DNA–Ericsson case study demonstrates how beneficial it is to have a CEM solution that is data driven, and that takes an agile development approach in speeding up and generating an advanced, insightful view of service performance.

Recommendations for the CSP industry

Recommendations for CSPs

Adopt an agile development model for your customer experience strategy

CSPs must follow DevOps and agile development practices, as demonstrated by the DNA–Ericsson engagement, for faster progress with their customer experience programs. DNA and Ericsson's engagement focused on driving continuous enhancement using Ericsson's Application Development and Modernization (ADM). The ADM agreement involves providing new releases of the solution within shorter periods, in this case every nine weeks, and therefore laid the foundation for constant improvement of the CEM solution. ADM follows the principles of DevOps focused on continuous development, continuous deployment, which ensures that the CSP assesses on a regular basis how an existing solution satisfies customer experience demands. By adopting this agile development practice, DNA and Ericsson have ensured that the DNA CEM solution remains relevant in achieving the operator's objective to provide customer service employees with information to enhance customer engagements.

Develop your customer experience strategy with the aim of improving employee satisfaction as well

The benefits of employee satisfaction to a CSP's customer experience strategy cannot be overemphasized. Employees' sense of gratification from their jobs will be evident in the way they relate to customers, and CSPs therefore need to prioritize the needs of their employees. CSPs can contribute to job satisfaction by getting employees more involved in decisions regarding the jobs they do. When investing in tools, consult with your employees to identify the key requirements of the solution that is to be deployed. Make use of their knowledge of the operations of the business to drive more value to your customers.

Recommendations for vendors

Understand the uniqueness of the market you are targeting

When developing customer experience solutions, it is important to understand the dynamics at play within the markets you are trying to sell into. For the CSP industry, for example, the growing consumption of data services means that data from multiple sources must be analyzed to provide insights for good service delivery. However, getting to the data is challenging, as the CSP

environment is highly siloed. Have a go-to-market strategy that includes how you plan to resolve the challenge.

Solution deployment teams must continuously engage with product development teams

Regular interactions between the solution deployment teams and the product development teams will help accelerate solution development. R&D departments for product lines that are part of the solution deployment teams need to keep a record of all issues that arise when deploying solutions to customers' environments. These records, in addition to other requirements coming from customers, should feed into the roadmap for the solution being developed.

Develop solutions that address the needs of multiple organizations

Always bear in mind that the customer experience challenge is not owned by just one or a few business functions within the CSP organization. It is owned by all of them, so their needs must be considered and aligned with the solution. Consider how the functions of each employee would impact the CSP's ability to deliver good customer experience. Then identify the functions and data insights that would help each employee deliver the best experience to their customers.

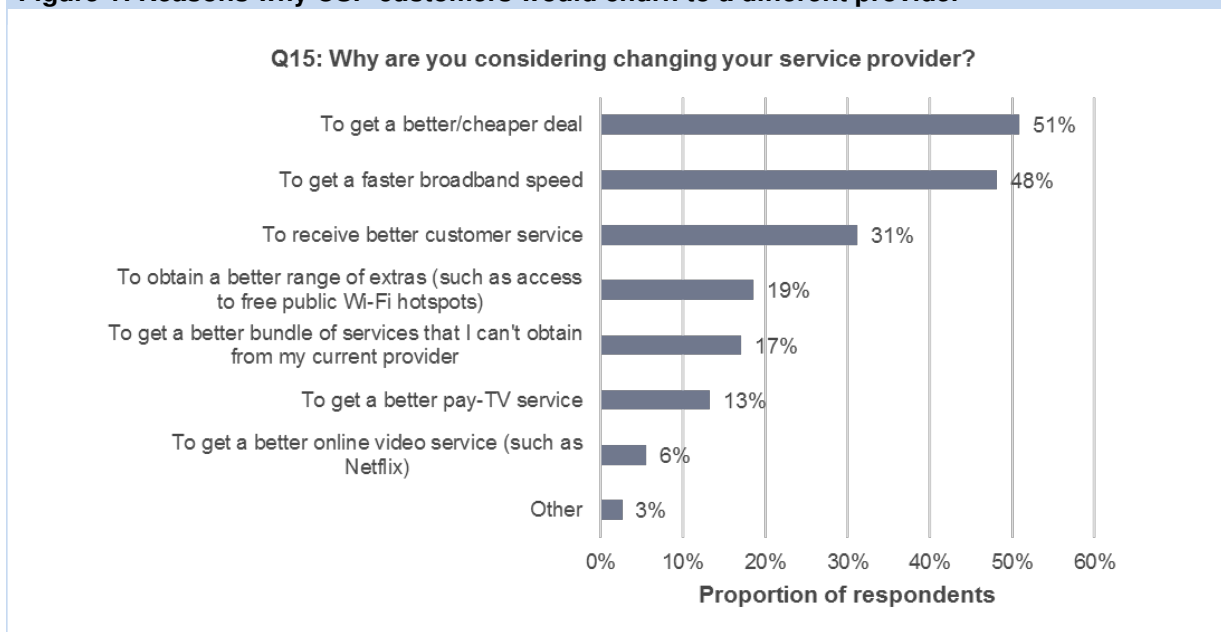
Improving customer experience by continuously enhancing visibility into service behavior

Setting the business context

CSPs need to enhance customer service operations to improve customer experience

CSPs are constantly looking for new ways to improve the experience delivered to customers. While many are launching new services to meet customers' growing demands, they should also focus on other factors that can foster customer retention.

Customer service plays an important role in CSPs' retention strategies, as highlighted in Ovum's 2017 Digital Consumer Insights survey. Respondents to the survey were asked why they would consider changing their CSP. Survey results (as shown in Figure 1) indicate that the search for a CSP that delivers better customer service is the third most popular reason that a subscriber will churn to another provider. That being the case, CSPs must prioritize investments in customer service operations to limit churn.

Figure 1: Reasons why CSP customers would churn to a different provider

Source: Ovum's Digital Consumer Insights Survey, 2017

CSPs are adopting several methods to enhance customer service. These include increasing the number of customer engagement channels, with a focus on digital channels such as social media, mobile applications, and more recently chatbots. Others are insourcing their customer service operations to ensure they retain control over these operations. CSPs like Finnish operator DNA are looking at how their data assets can be used to enhance customer service operations.

DNA seeks to enhance its view of customers' perception of services delivered

Founded in 2000, DNA provides services including mobile broadband and TV services. Ovum records that as of 1Q17, the CSP held a 27.2% subscriber share in the market. At the end of its fiscal 2017 year, the operator reported revenues of €886m, a 3.2% increase on 2016. DNA competes with Elisa and Telia, which have 40.0% and 32.6% subscriber shares within the Finnish market, respectively.

DNA finds itself in a unique situation compared to CSPs in other countries and regions. According to Ovum's report *Finland Update: July 2017*, the Finnish market holds top position when it comes to consumption of mobile data services, with average mobile data usage per person growing to 14.1GB in 1H16 and more than 75% of mobile data users subscribed to speeds of 10Mbit/s or more. Finland-based operators have retained this top position in high data usage for almost 10 years.

Several factors account for this high data use in Finland. Not having data caps has been a strong driver for high mobile data usage for DNA, as Finland is one of the few countries offering unlimited data plans. Also, Finnish operators typically do not bundle subsidized handset offerings with service contracts, meaning that mobile customers buy handsets and mobile services separately. So to encourage take-up of data services in a market where there are no caps on data usage, and mobile services are not bundled with mobile services, DNA (like other operators in Finland) had to adopt several strategies. In addition to pricing strategies – CSPs with operations in Finland have one of the lowest pricing models for high data service plans – it has focused on improving customer satisfaction to attract and retain customers. This focus also influenced the operator's rollout of its 4G LTE network.

To improve customer experience, DNA aims to provide care agents with greater visibility into service behavior

The journey toward improving the customer experience for its mobile broadband services commenced with DNA's LTE network rollout. DNA sent out a request for proposals (RFP) in 2010 for the deployment of its LTE network. Ericsson won the contract, which was to run for three years, in 2011. Following this contract win, Ericsson became the operator's prime network equipment provider (NEP) for its LTE network.

As a follow-up to the contract win in 2011, DNA challenged Ericsson to provide a solution that would enable customer care agents to determine the quality of service as perceived by the end customer. A key objective for the operator was to empower care agents with insights that would help address customers' issues quickly, with a view to improving operational efficiency.

DNA wanted its care agents to have full visibility into the services being consumed by customers, in order to react proactively to customers calling the contact center. At the time, care agents did not have a real-time view of customers' perception of the services they were consuming.

One of DNA's key requirements was to have a solution that measures the throughput of its mobile broadband networks on a per-customer and per-service basis. To reduce the opex requirements for the solution, DNA wanted one that could reuse and extend the functionalities of existing telco/IT platforms used by the care agents. There was also a need for care agents and technical support teams to leverage the same tools to ensure that they had the same view of the experience delivered to the customer, and so could work more effectively to resolve customer issues.

The role of big data and analytics in solving the CX challenge

The existing landscape hindered DNA's care agents' view of customer issues

The existing IT infrastructure supporting DNA's service operations was limited in terms of its ability to provide a good view of the performance of the services consumed by customers. Consequently, finding a resolution to customer complaints was a difficult and lengthy process. First-line support (L1) could not identify root causes of customer issues, resulting in issues being escalated to second-line (L2 for technical support) and third-line support (L3 from CSP's network operations team or outsourced field operations company). These escalations placed huge demands on these employees, while extending the time to resolution.

Furthermore, care agents and network engineers had to log into several (about 10) OSS and BSS applications to resolve issues. These operating functions did not use the same tools so did not share the same views of the issues being reported, further aggravating the challenges faced when resolving issues.

DNA embarks on a transformation journey involving people, processes, and tools

To improve its customer services operations, DNA embarked on a transformation of its customer service operations. The operator focused on changing and simplifying the tools used by customer service employees to make it easier for them to address customer issues effectively. DNA also invested in its people and the processes involved in customer care and operations to ensure that they were well positioned to deliver a good customer experience.

DNA's Customer Experience Transformation Program included the following elements:

- Using data to improve customer and network operations: The company analyzed and visualized data in a way that helped it understand the network, customer, and service issues that could be impacting the customer experience. It sought to identify the key performance indicators (KPIs) and metrics, starting with those that highlighted customers' perceptions of the service they consumed. DNA also considered how data insights from these KPIs could help resolve trouble tickets that were escalated by the L1 care agents to the technical support team. DNA wanted to enhance the operational efficiency of its L1 agents in addressing customer complaints. A key target was to reduce churn and the time to resolution for customer queries.
- Consolidating the tools that L1 care agents used when resolving customer issues into a single tool: All the insights the agents required to address customer issues would be present on a single interface. This approach would ensure proficient delivery of care services while improving the experience delivered to customers.
- Making organizational changes: Prior to this engagement with Ericsson, DNA outsourced most of its customer service operations. However, with DNA's strategic focus on having control of the customer experience, the operator decided to insource customer care staff supporting all consumer-focused services and enhance the processes supporting their operations.

Ericsson provides a CEM solution that uses big data analytics to provide greater visibility to care agents

In response to DNA's requirements, Ericsson started a research project called "PerfMon." This project, which evolved to become the DNA CEM solution, involved the collection, correlation, and analysis of different data sets from different sources with a view to understanding each customer's service behavior, highlighting any service-impacting issues and identifying their root causes. Solution development commenced in 2011, and DNA worked with the vendor to develop the solution, providing ideas on key functionalities that had to be in place to support the development lifecycle.

Development followed Ericsson's Application Development and Modernization (ADM) approach, which involves iterative and continuous development of the solution to be delivered to DNA. DNA would generate requirements, and both parties would meet to discuss and plan for software updates based on these requirements. The process of software updates occurred every nine weeks.

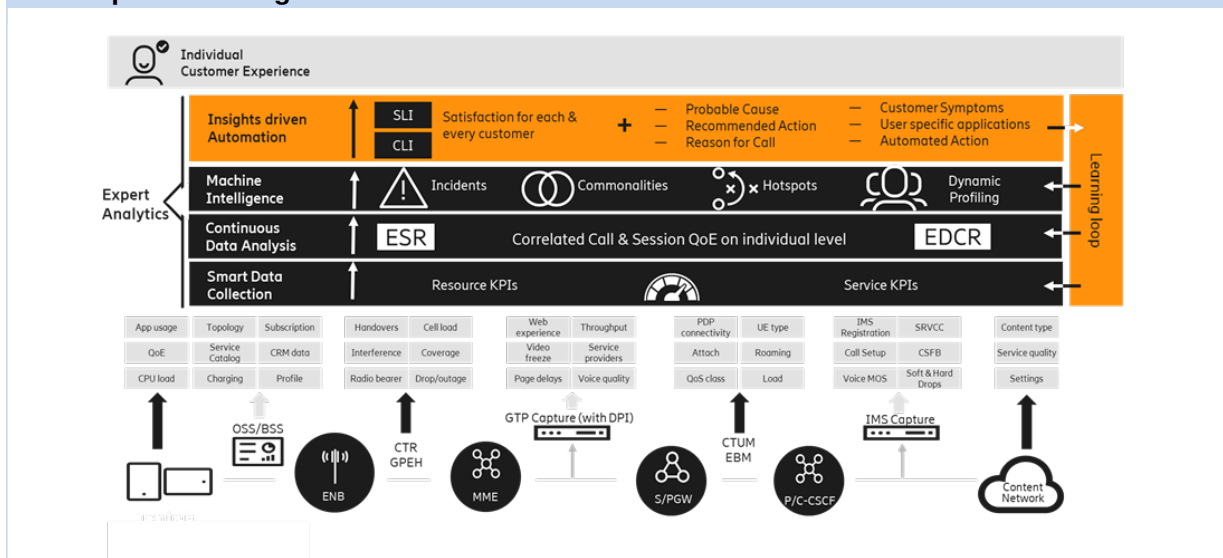
Turning network-related KPIs into service-related KPIs

CSPs traditionally monitor network performance to determine the quality of the service delivered to customers. However, when tracking customer experience, there is a need to track service quality relative to how the customer perceives the service. Therefore, Ericsson's first step in developing a CEM solution that addressed DNA's requirements was to identify how to transform the network-related data being collected by the network teams into end-user service experience data (or KPIs) that reflected the true nature of the service experience perceived by each customer.

To track service performance as perceived by the customer, Ericsson started collecting user plane data from probes. The user plane (also called the data plane, forwarding plane, carrier plane, or bearer plane) provides data on the actual movement of customers' data packets over the transit path within a network. The analysis of user plane data reveals information such as video freezing, buffering, and throughput (similar to insights that can be obtained when performing drive tests) as perceived by the customer.

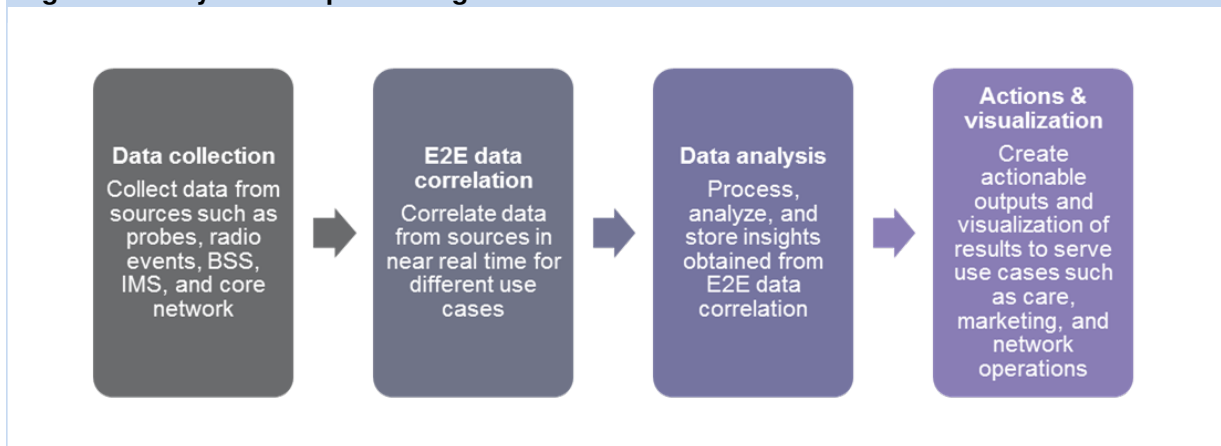
The next step for Ericsson was to correlate the user plane data with data from other sources, such as radio events, CRM, OSS/BSS, core network, and other customer-related information systems. This correlation was done continuously for all data sessions established on the network for every customer (as shown in Figure 2). Incidents (events indicating when KPIs fall below predefined thresholds, highlighting possible service degradation) can be easily identified as the data sources are correlated. Furthermore, this correlation provides an E2E view of the customer experience, and enables faster root cause analysis of customer experience issues.

Figure 2: Ericsson's Expert Analytics solution correlates data for every session to provide user experience insights



Source: Ericsson

Root causes for poor customer experience include, but are not limited to, incorrect provisioning (where a customer is using the wrong device to access a service), incorrect device settings, radio coverage and congestion, and third-party provider server issues. The benefit of providing real-time insights for root cause analysis makes the correlation phase a critical functionality of the Ericsson solution. The results from the correlation of the different data sets also allow for a reduction in the volume of data that is passed on to the analytics layer.

Figure 3: Analytics data processing model

Source: Ericsson

As shown in Figure 3, results from the correlation layer are then passed on to the analytics layer, where analytical components provide root cause analysis and generate triggers for next best action to be taken.

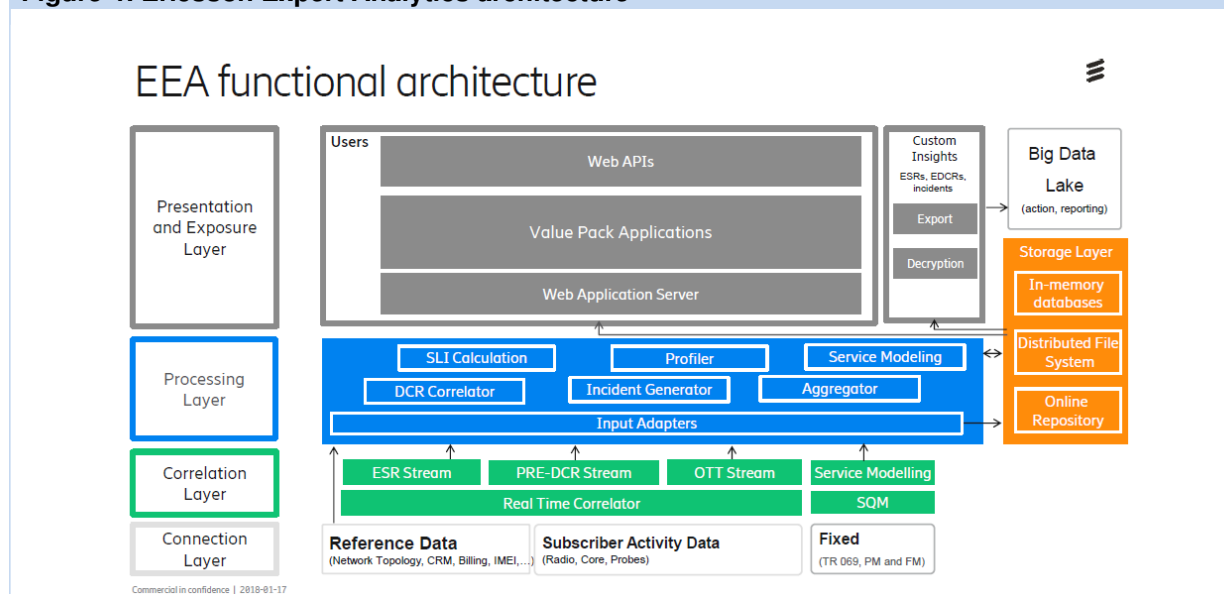
Some of these next best actions can trigger automated actions such as provisioning, changing cell level parameters, raising a trouble ticket for resolution of identified incidents on the network, traffic shaping, or application of network policy changes, to ensure that the customer's experience is not dampened. To ensure that customers continue to receive the best experience, the processes involved in collecting information regarding perceived customer satisfaction, incidents associated with each call or data session, possible root causes, and the next best action can be automated (as long as company policies are adhered to).

DNA upgrades its prototype solution to Ericsson's Expert Analytics product

Further research and development of the Ericsson solution prototype, PerfMon, led to the creation of Ericsson Expert Analytics platform (EEA). Given the fast rate of growth of CSP data assets, Ericsson developed EEA as a CEM platform based on big data analytics, which includes prepackaged analytics applications (referred to as value packs) to ensure the effective management and analysis of data assets associated with CEM. It was launched as a productized CEM solution in 2015.

DNA, however, continued to work with and develop its customized CEM solution with Ericsson, using the ADM development model. To get access to insights generated within EEA, Ericsson provided an API that exposes the services provided by EEA, such as KPIs, incidents identified, and next best action, into the operator's CEM solution, enhancing the care agents' user interface. For example, instead of looking at time series trends associated with the KPIs, EEA can through these APIs provide information about the incidents, such as when the incident occurred, where it occurred, and likely customers impacted. These insights accelerate the incident resolution process.

By 2017, DNA had upgraded its PerfMon solution to EEA but still uses the ADM model to enhance the solution it currently uses. Figure 4 provides an overview of the Ericsson Expert Analytics platform.

Figure 4: Ericsson Expert Analytics architecture

Source: Ericsson and DNA

Data integration was not as much a challenge as the management of vast data volumes

Ovum's report *How CSPs are Taking Advantage of Big Data* highlights that data remaining in silos is CSPs' top challenge when executing big data strategies. CSPs must deal with a lot of legacy systems, which operate in silos and have no provision to integrate with other systems. Pulling data out of these systems and integrating them with big data platforms is difficult, time consuming, and expensive.

However, the extent to which the data-silo challenge could have impacted the deployment of the DNA CEM solution was limited, as Ericsson is the prime provider of DNA's mobile broadband network infrastructure and support systems. Ericsson could integrate directly with most of the systems that acted as data sources (which includes 70 Ericsson systems and about 30 from other vendors). Ericsson had the relevant interfaces and product details all in-house, so it was relatively less cumbersome to deploy the Expert Analytics solution.

However, radio events coming from a third-party radio supplier had to be integrated with the solution. Within the Finnish telecom market, DNA and Telia have a joint partnership that involves network sharing (where the two CSPs share network resources and spectrum in the sparsely populated northern and eastern regions of Finland). The joint network infrastructure includes products from third-party network vendor Huawei. Therefore, call traces relating to data sessions of DNA's customers (which is one of the data sources that is fed into the Expert Analytics solution) include data relating to Huawei's equipment. Given Ericsson's capabilities and experience in integrating and managing multivendor solutions, the vendor could counter the data integration challenge.

The bigger challenge for Ericsson and DNA was the vast amount of data that was running on the network. The flat rate on data usage in the Finnish market puts usage per subscriber at a very high level of about 15Gbps per month. This high level of data usage (with about 2 million mobile broadband subscribers as of 2012) when the CEM solution was deployed implied that increasing data volumes put unique performance and scalability requirements on the solution. Consequently, certain elements had to be designed to meet the market demand. For example, it was necessary to invest in

a big data platform that had the capability to hold these massive amounts of data. Other challenges included deciding which data sets to focus on and identifying the most relevant insights to feed to the business.

The initial solution rollout was focused on engineering functions, so DNA had to make further requests to Ericsson to simplify the output of the data to make it simpler for other non-engineering staff, with a specific focus on mobile broadband speed visualization.

Outcome assessment

DNA's CEM solution yields multiple results and benefits

The deployment of DNA's CEM solution (which has now been upgraded to Ericsson Expert Analytics) has empowered customer care agents to address complaints proactively and has improved the operational efficiency of care and network operations staff.

The user interface accessed by each L1 care agent provides advanced insights into each customer's view of the services they consume, enabling employees to identify key issues that could negatively impact the customer's experience quickly. The UI also provides care agents with guidance on the next best actions to take to address the highlighted service incidents, increasing first-call resolution rates and reducing the time taken to resolve customer complaints.

With the level of information made available to L1 agents, the number of customer issues escalated to the more technical employees in L2 and L3 is reduced. The CSP reports that the number of tickets escalated from customer care to technical units has reduced from 2,000 tickets to 200 tickets per month. DNA is very confident in the capabilities the solution brings to care agents, and has set up a KPI called "first-time right." This KPI tracks the number of times (for each agent) within a three-month period that a customer does not call back to report the same issue. If within three months of raising an issue the customer calls back complaining about the same issue, DNA considers itself to have failed in delivering a good experience to its customers.

With all employees sharing the same view of the experience delivered, the amount of time spent trying to interpret customer issues when they are escalated to higher-level support teams has reduced, implying that time to resolution is reduced. Consequently, the operator has seen its NPS scores improve. In 2016, its corporate customer services saw its NPS improve by 34%, while its 2017 annual results indicate that overall NPS improved by five points.

The solution is currently used by about 1,000 of the operator's 1,600 employees, highlighting the benefits that the solution brings to employees across the business. DNA is using the insights drawn from EEA to bridge the gap between technical data and business data. DNA and Ericsson worked together to ensure that the insights generated from the tool are relevant to other business functions, translating the technical insights in a business language that can be easily understood by other teams. For example, employees from marketing, product management, and strategy make use of the tool for their daily operations. Employees in departments such as radio planning and the optimization team are using the data insights to analyze and design the network.

With the implementation of the ADM approach, over 30 sprints with more than 600 new technical implementations have been achieved to date. Each development sprint was customized to DNA's business and its customers' needs.

More activities are in the pipeline for the future

DNA and Ericsson will continue to extend the scope of analytics and use cases of all the data insights obtained from the correlation and analysis of the different sources. They are also considering other data points that can be included in the solution. DNA is currently in talks with Ericsson to understand how they can leverage the Expert Analytics solution to support fixed service offerings.

Within DNA, there is currently a shift underway from engineering-focused use cases to data monetization use cases of the customer engagements. This implies that there is a growing demand to leverage the Expert Analytics solution to support marketing, network planning, and other business use cases. This is a big change from technical use cases to more business-related use cases.

There are also initiatives to increase the automation use cases using AI/ML concepts to gain opex efficiencies. Many different approaches are being considered by both parties. These include using AI/ML and automation to enable closed-loop actions such as pre-populated ticket handling, network policy adjustment, and proactive incident investigation based on anomaly detection.

As part of the development roadmap for its EEA product, Ericsson is working with a select set of customers to run trials for new features and functionalities of EEA. DNA is one of the customer partners it meets with regularly, and will continue to do so to discuss its roadmap and to trial new EEA features and functionalities.

Lessons learned

Develop CEM solutions that are data-driven and unify network and customer data

When DNA and Ericsson started correlating data sets from different data sources, they were able to build a better view of how the services they delivered performed. Analyzing these data sets in silos reveals few insights compared to the vast insights now being consumed by DNA's business to deliver a better customer experience. Therefore, establishing a model that takes into consideration network- and customer-related data sets will be highly effective, not only to understand what happened but also to understand how many customers are impacted, what they have in common, and how to resolve the problem.

Get your employees involved in CEM strategy

Employees were fully involved in the solution's development, as requirements for every release phase were driven by feedback generated by employees who were not just users of the tools but fully involved in daily interactions with customers. However, a control mechanism was put in place by DNA to help prioritize the requests coming into each development phase. Ericsson and DNA then go into joint evaluation of the requests, evaluating the duration for the implementation of requests and how these align with the priorities of the business.

Maintaining a focus on providing employees with the required tool sets helped reduce the operator's employee attrition rate, as employees were productive in their operations.

DNA aligned staff development with the development of the CEM solution. So whatever feature release was introduced to the tool, all staff (especially care and operations) received training in line with the new functions and capabilities.

Work closely with vendor partners to develop agile development practices

Ericsson and DNA's joint approach to developing and continuously enhancing the CEM solution was critical to the success of the project. They worked together to understand the requirements for each release phase and develop the metrics required to support the requirements raised. The initial deployment of the research version of the solution required Ericsson to provide end-to-end support of the solution. DNA, on the other hand, had to be flexible with respect to the expectations being placed on the vendor. This joint approach helped accelerate the development of the solution.

Track KPIs relative to customers' perception of services provided

CSPs need to ditch the old approach of tracking network equipment performance or identifying worst cells or sites based on KPIs such as dropped-call rates. Aim to identify KPIs that reveal how the service delivered impacts the customer. This view and related views will help CSPs appreciate the issues reported by customers. Taking this approach can also help CSPs become more proactive in the services they deliver; instead of waiting for customers to call in and complain about a poor service, CSPs can take advantage of these data insights to send out information to customers, letting them know about an impending issue that could impact their service and the steps the CSP is taking to resolve the problem.

Support your CEM solutions with a knowledge-based system

Identifying that customers have a problem with their service is one step in solving the customer experience challenge; the next step is finding the best solution to the problem. CSPs require insights to address these processes quickly, and having a knowledge base of possible next best actions that can be taken to resolve customer issues is important. The benefits of building this knowledge are enormous. It can help with training of new staff and to reduce the time required to close a customer issue. A CSP's CEM solution can be programmed to use this knowledge base to provide information on the best response a care agent can provide to a customer and what information to share with technical teams.

With the network getting more complex, with more constraints to be analyzed, the identification of an optimal next best action can be difficult. This is where using a solution that leverages AI capabilities, supported by a strong knowledge-based system, becomes important.

Appendix

Methodology

This Enterprise Case Study leverages in-depth interviews with key stakeholders in Ericsson and DNA as well as a review of any available documentation such as strategic planning, annual results, and implementation documents.

Further reading

Mobile Connections Forecasts: 2017 – 2022, CES003-000122 (February 2018)

"These six resolutions for 2018 will help improve customer experience," INT001-000017 (January 2018)

Digital Consumer Insights 2017: Multiplay, PT0093-000002 (May 2017)

The Customer-Adaptive Enterprise, IT0020-000234 (December 2016)

The State of Customer Experience, IT0020-000225 (September 2016)

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