China Unicom built an AI-powered digital index to progress its transformation

Who?

Wanted to digitally transform itself so that it could make full use of the technologies available for its own internal business and operations, as well as for its customers and ecosystem partners, to compete more effectively.

What?

China Unicom was keen to leverage technologies including 5G, big data, cloud computing, artificial intelligence (AI) and other digital enablers, for its own internal use and to power the services it offers to customers and ecosystem partners. It was particularly focused on the transformation of three areas:

• Updating its organizational management to establish an enterprise strategy and culture, and make the most of its in-house talent.

• Improving its business operations to deliver greater value to customers, including by fostering an ecosystem of partners.

• Modernizing its Infrastructure in the most effective way by building a platform for the sharing of data, technology and business resources.

However, it faced a number of challenges. The operator had no defined goals and a lack of usable data to help it define those goals and their feasibility. It also lacked operational support for the transformation, such as closed-loop mechanisms to assess the formulation of the strategy’s objectives and their feasibility, then assess their progress and constantly improve the processes.

How?

Drew on TM Forum’s Digital Maturity Model and its own transformation vision to develop the IT Digital Index System (IDIS), which harnesses artificial intelligence to monitor and continuously optimize key areas of digital transformation and digital operations.

Results

The time for product delivery, end to end, fell by an average of 28.75% in 2019; productivity for leased line activation up 60%; cloud-based resources up from 35.8% in 2018, to 44% in 2019; work orders for faults fell from 30,000 in 2018 to 20,000 in 2019; improved direct sales via apps using data-based benchmarks.

To address these issues, China Unicom created the IT Digital Index System (IDIS) drawing on TM Forum’s Digital Maturity Model and its own vision for digital transformation. The Digital Maturity Model has five dimensions, customer, strategy, technology, operations and culture, each of which has a number of aspects that in turn are broken down into criteria against which organizations can test their digital maturity. The operator also used some of the Forum’s guidebooks and best practices to help it fully leverage the Digital Maturity Model, including:

• Digital services consumer workforce transformation

• Transformation towards the operations center of the future

• Communications service providers workforce transformation implementation experience, and

• Operations center of future – future competencies, roles and culture.
Developing the IDIS

To ensure that the measures and tasks derived by breaking down the strategy were scientific and feasible, China Unicom set up teams of experts from all the fields across the group. They came up with objectives based on the development status of the IT across the company measured against the strategic goals and what was needed to realize them. The operator also set up virtual expert teams, who could be accessed on demand to solve problems, to gain full value from its pool of talent.

This enabled the operator to decompose strategic initiatives and tasks, layer by layer, to help organize the group’s overall IT operations. Critically, it helped the teams address how to implement the strategy captured in IDIS in the existing organization, business and IT fields.

IDIS created an IT digital index (metric) for each IT domain and the dimensions within them by quantifying its IT capabilities in every unit, from headquarters, to provincial offices and subsidiaries.

The key to the success of the whole project is harnessing data from across China Unicom’s entire IT estate using analytics and artificial intelligence (AI) – machine learning, deep learning and neural networks. The analytics and AI fuel two key functions: the intelligent, dynamic evaluation model and intelligent data analysis.

The IDIS dynamically adjusts each index and its weighting in real time, as the IT digitalization process advances. It has three first-level indexes, 12 second level ones and 28 third-level quantifying indexes. The third level ones are created by weighted calculations to form the second-level index, which feeds back into the third-level and recursively comes up with the index for each IT unit in the company.

AI’s ‘learning’ is done via a closed-loop management and operation system for IT to evolve functions like monitoring strategy objectives and their implementation, to identifying and solving problems. In this way China Unicom can coordinate the development of IT and control the transformation, improve IT’s capabilities and efficiency, and provide a basis for making informed decisions about resource allocation. Benchmarks were created to help and promote the coordinated developments with subsidiaries.

At the same time, the IDIS constantly improves the effectiveness of the knowledge base on which the evaluation model relies and continuously updates it using AI algorithms, which ‘learn’ and adapt their behavior from what they learn, enabled by neural networking.

Optimizing the evaluation model

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The IDIS also built an intelligent data analysis framework, providing analytic capabilities like clustering, multi- and cross-dimensional analysis, and correlation analysis. The mined data and AI also helped China Unicom overcome implementation challenges, to ensure the transformation resulted in Lean operations, in three main ways:

- Visualization of IT capabilities by displaying index and operational data in a hierarchical and systematic way, and users were given data analysis tools to help them find development gaps and problems, and work out solutions.
- Digitalization of IT capabilities using the dynamic evaluation model and IT indexes to quantify IT capabilities, then analyse and monitor the development process using the framework outlined above to provide insights for implementation of the strategy.
- Indexation of IT capabilities to undertake strategic objectives and automatically collect data related to the necessary initiatives and tasks, then form an IT index library using the intelligent, dynamic evaluation model.

Once the strategic tasks were defined, adaptive teams were put in place with responsibility for specific aspects of implementation. Then closed-loop mechanisms ensured the implementations delivered on their objectives from execution to review.

Ensuring successful implementation

This pioneering approach to transformation delivered many business benefits to China Unicom. They include:

- Less time for end-to-end product delivery – from receiving orders, to order decomposition, provisioning, activation and so on – falling by an average of 28.75% in 2019 overall, and at Heilongjiang, a provincial branch, it fell by 47.8% between April and October.
- Greater efficiency in leased line activation by deploying a BSS/OSS solution in six provincial branches – Hainan, Chongqing, Qinghai, Ningxia, Xizang, and Shanxi – which enabled China Unicom to reduce the time taken to activate a leased line from 248 to 98 per order while on average increasing the branches’ productivity by 60%.
- Increasing the concentration of cloud-based resources by using the IDIS to monitor the relevant index led to more of the operator’s resources being integrated into a unified IT cloud-based resource pool, rising from 35.8% in 2018, to 44% in 2019.
- Customer experience was improved in stores by using indexes to monitor then optimize system processing and business management, which improved sales. For example, at the shop near Beijing Asian Games Village the queuing time fell by 30%.

With the help of TM Forum, China Unicom intends to explore further the organizational innovation model for digital enterprises with partners, and to contribute its transformation experience to help construct a global ecosystem of major international operators.
Maximizing impact

To create this program, China Unicom had to develop and refine a variety of techniques in customer experience measurement and management and to determine which had the most direct impact on its operating results. The company learned many lessons as a result which helped it to realize specific customer experience, cost and revenue benefits.

The team created a digital customer emotional experience module. It was optimized through multiple iterations to refine how public opinion and perception data is acquired and used. The team also learned to use its NPS-based customer evaluation system to identify the most valuable customer data and to target the correct customer mix for perception surveys. Its satisfaction questionnaire and multi-scenario optimization solution determined ways to improve customer experience perception further.

China Unicom learned to measure and manage customer experience perception with the integration of both business and network domains to improve customer experiences in specific vertical industries. In turn, the company says it will be able to use this approach to improve its 5G network as well as its operational and maintenance efficiencies to reduce costs and continuously improve customer perception in the future.