AvidThink Research Note

Netcracker Digital Platform

A Platform Approach to Accelerating CSP Digital Transformation

Netcracker Technology, a wholly-owned subsidiary of NEC Corporation, recently announced its Netcracker Digital Platform, a modular and open solution designed to kick-start and accelerate the Communication Service Provider (CSP) to Digital Service Provider (DSP) journey.

In this AvidThink Research Note, we examine Netcracker's announcement in the context of today's CSP core initiatives and critical challenges. Our analysis is informed by engagements with top-tier CSPs on emerging telco opportunities and transformation initiatives, as well as ongoing briefings and conversations with CSPs, hyperscalers, and vendor-partners.

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Zero to Uno — The CSP Digital Quest

CSPs frame their opportunities in terms of communications technology updates, infrastructure landscape changes, and over-the-top (OTT) application shifts. The telcos speak of software-defined wide area network (SD-WAN), 5G, and network slicing; they debate the hyperscaler cloud and edge threat and opportunity; and they agonize over new services like streaming media, cloud gaming, and online collaboration that represent significant perturbations to their business.

Yet CSPs keep tumbling headfirst into new initiatives without making necessary cultural, operational, and platform preparations. While CSPs may understand the need for digital transformation and might be able to spell "cloud-native" as well as they spell "5G", the blueprint to success can be elusive.

Digital and Cloud-Native Foundations for Unlocking Value

CSPs are not entirely naïve. Many recognize that demand for a new wave of services and the momentum around 5G and fiber rollouts can be attractive business opportunities to catalyze their transformation into digital powerhouses.

AvidThink's 2021 Telco Infrastructure Report noted that key telco initiatives included 5G buildouts, private enterprise networks, edge computing, SD-WAN/SASE, IoT, digitization of customer experience (CX), and operations support system and business support system (OSS/BSS) cloudification. As part of our 2022 report refresh (to be published soon), we've been speaking with CSPs about new services they are contemplating, launching, or updating. Unsurprisingly, essential services attracting investment include ongoing 5G enhanced mobile broadband (eMBB) and fixed wireless access (FWA) expansion, along with trials on network slicing. Similarly, fiber buildout (for 5G and FTTx), SD-WAN/SASE, and private enterprise mobile networks continue to hold their interest and budgets, as does edge computing. There's also a resurgence around IoT tied to vertical markets and the edge. Finally, CSPs continue to push trials in next-gen collaboration, extended reality (XR) — including augmented and virtual reality (AR/VR), and they are actively exploring vertical market full-stack solutions across automotive (C-V2X), Industry 4.0, health care, and retail.

For CSPs to rapidly launch, monetize, manage, and assure these services CSPs need agile platforms and processes to build on. However, today's CSPs face multiple blockers to success, including:

- **Legacy inflexible charging platforms** that cannot support new business models, rapid service launches, and responsive changes.
- **Siloed and proprietary operational platforms** that limit extensibility, with **unresponsive vendors** that take too long to implement new features.
- **Operational inefficiencies** that prevent fast service rollout, limit the rate of scale-out, and impact service recovery times on failure.
- **Clunky and archaic customer portals** that provide poor CX, get in the way of self-service, and discourage engagement.
- **Lack of in-house expertise in cloud-native** and agile processes and difficulty recruiting and retaining sought-after talent.
- **Limited platform API and integration points** which impede fast onboarding and integration of partner solutions.
- **Weak in-house vertical industry expertise** and no vertical business solution frameworks to support partner solutions, plus missing go-to-market platforms for selling integrated solutions.

Many of these elements are manifestations of a legacy culture lacking digital experience, and unused to selling full-stack business products and services. There's a clear need for modernization, and looking to enterprises and cloud providers who have led the digital charge can provide a roadmap for positive outcomes in telco digital transformation.

Learnings from examining successful digital-first initiatives include:

- **Build on a cloud-native platform and adopt agile development and deployment techniques.** Well-understood, agile, software architecture and processes bring flexibility and scale. Embrace open source and commercial components proven and trusted by cloud providers to improve product quality while launching new services faster.
- **Discover and leverage available services instead of reinventing solutions.** APIs rule the web, and using these services as part of telco workflows will lead to faster time-to-market with increased innovation.
- **Embrace an agile culture, aggressively automate, and think at scale.** This includes pushing for single-source-of-truths, intent-based, fault-tolerant, and distributed designs. It also includes adopting loose coupling, modularization, and disaggregation principles to facilitate scaling.
- **Learn to manage and leverage data across all aspects of operations.** Rather than logging and archiving data streams for reporting purposes only, employ big data analysis and AI/ML to extract actionable insights from data for revenue and operational optimization, CX improvement, and better security.
- **Engage both consumer and business customers as part of the CX process.** Drive for convenience and self-service where possible, empower customers to make service changes and benefit from insights into their data. This also offloads telco customer care teams and increases customer satisfaction.
- **Evolve a platform and API mindset.** View the telco not as a service provider but a platform for partners and customers to build innovative services on. Whether for vertical solution providers, global system integration partners, or business customers, providing rich APIs extends the telco ecosystem and makes CSP platform more valuable and stickier.

Our on-the-ground work with multiple tier-1 CSPs leads us to believe that while forward-thinking CSPs are charging ahead with cloud and digital transformation, redirecting massive telco tankers is an arduous task. This effort will take substantially more than a village, so finding partners with the right type and level of expertise, whether hyperscalers, global system integrators, or leading network solution vendors, is essential to success.

Netcracker Digital Platform

Netcracker has been working with major service providers worldwide on joint transformation projects and has taken a proactive approach to its new platform initiative. The newly-launched Netcracker Digital Platform is presented as an open, modular, digital-native solution that drives innovation and enables agility, facilitating rapid CSP business growth.

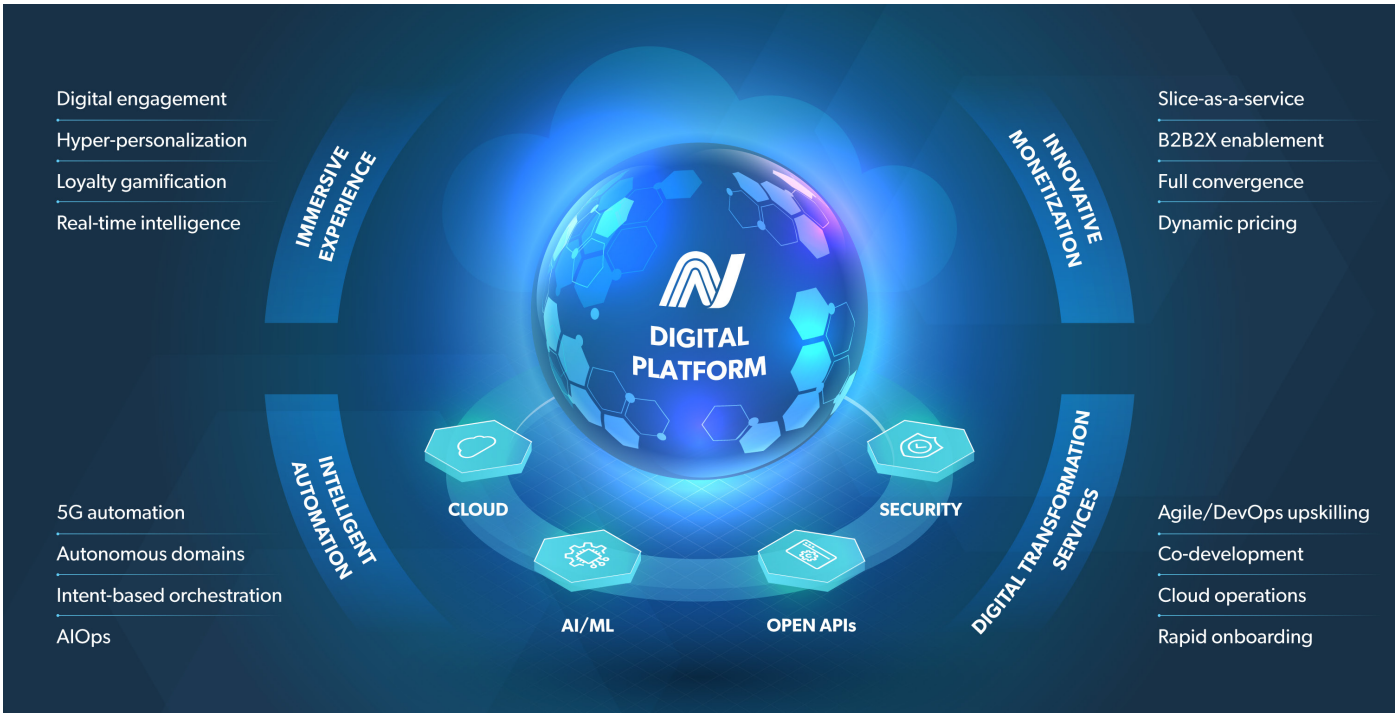
While the combination of multiple services into Netcracker Digital Platform is new, many of the platform components existed prior but have been updated, refined, and rearchitected over the years. As Netcracker learned from deployments with carrier customers, it adapted and evolved its platform. There are four key pillars in Netcracker's new platform:

- Immersive digital experience
- Innovative monetization
- Intelligent automation
- Digital transformation services

Netcracker Digital Platform is built on a cloud-native foundation and is available via SaaS. It is designed for, and has been demonstrated to run on, both hyperscaler and private telco clouds.

Netcracker has leveraged AI/ML technologies across the platform, applying them to security for optimization and anomaly detection; to CX for churn management, recommendations engines, customer service optimization; and telco operations for forecasting, RAN optimization, performance management.

NETCRACKER DIGITAL PLATFORM



(Source: Netcracker)

To facilitate integration with partner and vertical solutions, key APIs into the platform are open and conform to a range of industry standards from organizations such as TM Forum, MEF, ETSI, ORAN Alliance, and 3GPP.

Finally, to address ongoing concerns by CSPs around security and privacy, Netcracker has instituted **strong security practices** and subjected itself to a series of audits by the U.S. Department of Justice and Netcracker carrier customers. Netcracker has published a **security white paper** detailing the results of independent audits and security scoring services.

Netcracker Digital Platform - Immersive Digital Experience

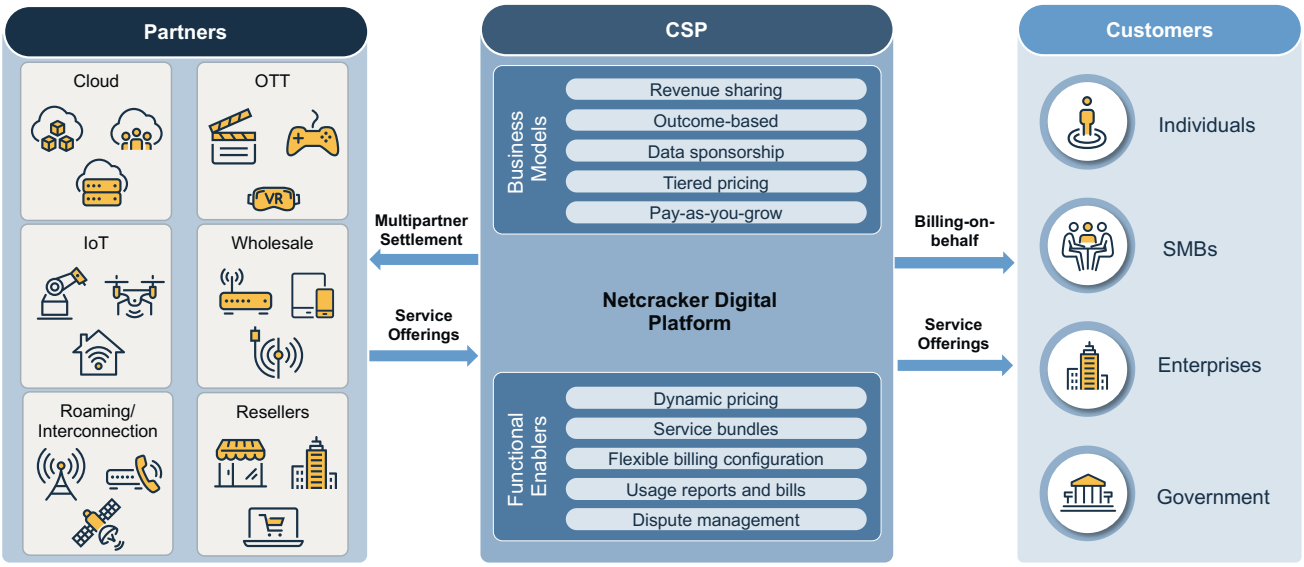
Netcracker's Immersive Digital Experience brings together recent digital channel engagement capabilities, including improved personalization, gamification, reward and loyalty programs. The level of hyper-personalization possible on the platform is achieved through big data, AI/ML, and natural language processing (NLP), with the use of real-time recommendation and decisioning engines fed with extensive data about a customer. Many of these techniques have been successfully used by e-commerce vendors like Rakuten. Unsurprisingly, Rakuten Mobile is working with Netcracker to apply similar capabilities to its mobile customers.

Netcracker Digital Platform applies the same digital channel capabilities to internal operations. This provides a real-time, unified agent view and leverages AI/ML and guidance engines to improve CX. The platform supports hybrid and work-from-anywhere initiatives via SaaS, providing telco support teams with increased flexibility.

Netcracker Digital Platform - Monetization

A major impediment to new service business model design, and time-to-market, is inadequacy in telco billing platforms. Netcracker Digital Platform aims to overhaul legacy BSS by supporting new business model enablement with flexible monetization arrangements, including revenue sharing, outcome-based payments, data sponsorship, tiered pricing, and pay-as-you-go models. By providing options for B2B2X deals through dynamic multiparty settlement and billing-on-behalf for partners, Netcracker hopes to unshackle telcos from staid business models.

FLEXIBLE BUSINESS MODEL ENABLEMENT



(Source: Netcracker)

The platform supports 3GPP-compliant 5G converged charging options, with rating and discounting flexibility. Importantly, it also includes SLA-based and network slice-as-a-service monetization models, and dedicated charging for MEC applications in distributed edge computing. As part of ongoing IoT buildout, the platform enables smart event aggregation to handle IoT accounts with millions of SIM cards, reducing processing load by up to three orders of magnitude.

The platform runs analytics and AI/ML on customer data to provide scoring, next-best action, optimized treatment schedules, and personalized real-time video bills to improve CX and customer retention.

Netcracker Digital Platform – Intelligent Automation

Netcracker has made investments in improving operations automation for the CSPs. Netcracker Digital Platform supports 5G operations from planning and design to deployment, optimization, and assurance. It incorporates the communication service management function (CSMF), network slice management function (NSMF), and a network slice subnet management function (NSSMF) for network slicing and sub-slicing as well as multi-access edge computing (MEC) service orchestration. Automation capabilities incorporate AIOps, and spans multiple domains, from RAN (including Open RAN and MEC) to transport/xHaul and core. Cross-domain orchestration is achieved via an intent-driven, declarative model.

While providing end-to-end service orchestration across all domains, the platform also supports each domain independently and autonomously. Netcracker Digital Platform combines multiple elements: network, service and MEC application orchestration, configuration management, active inventory, assurance, slice management, and AI/ML to create a closed-loop autonomous domain. Open APIs to other peer domains and northbound systems facilitate modularity and external integration. Meanwhile, AIOps on the platform includes preconfigured data marts with models for a wide variety of use cases, including forecasting, anomaly detection, and optimization.

As part of edge computing initiatives, Netcracker provides unified edge stack automation that manages distributed edge platforms — both CSP-owned and hyperscaler-provided. And in a bet on Open RAN, Netcracker Digital Platform provides an Open/vRAN domain orchestration solution to fully automate the RAN as CSPs evolve from 4G to 5G and full disaggregation. It aligns with the O-RAN Alliance Service Management and Orchestration (SMO) framework, including configuration management, service and network orchestration, active inventory, assurance, and its new non-real-time RAN Intelligent Controller (non-RT RIC) supporting various optimization use cases through rApps.

Netcracker Digital Platform – Digital Transformation Services

To address the skills and recruitment challenges that CSPs face, Netcracker has packaged its expertise and codified its experience while acting as a development partner to the CSP. Beyond incorporating and validating their solution on multiple cloud platforms, Netcracker takes a center of excellence (CoE) approach — mentoring, coaching, and training CSP teams to help them develop digital self-sufficiency, embrace cloud architectures, and learn DevOps and agile processes.

To assist CSPs with extracting value from data, Netcracker Digital Platform includes its Operational Monitoring & Analysis (OMA) engine — an out-of-the-box tool for centralized business and technical KPI monitoring in multivendor environments. The OMA engine includes preconfigured templates for data discovery, reporting and visualization, and custom configuration to support service continuity and operations optimization.

Meanwhile, to help CSPs protect their data, Netcracker incorporates security best practices in architecture, processes, and use of vulnerability management tools. Its Enhanced Security Perimeter keeps sensitive CSP customer data from breaches.

Netcracker provides accelerated onboarding via a SaaS model to reduce CSP time-to-market for new services. Using preconfigured cloud environments allows CSPs to validate and train on Netcracker solutions while collaborating on customization and feature development.

AvidThink's Observations on Netcracker Digital Platform

Leading OSS and BSS vendors understand the need to modernize, digitize, and adopt cloud technologies and processes, including AI/ML, big data analytics, DevOps, and agile practices. Netcracker has done an admirable job moving the ball forward across all these initiatives. We see Netcracker Digital Platform as a natural evolution from the Netcracker 2020 platform launch two years ago. To its credit, Netcracker has continued to rack up wins for its platform in the market. The numerous recognizable names on the customer list for the platform speaks to ongoing market traction for Netcracker.

As analysts with ongoing practitioner-level engagement with leading CSPs, Netcracker Digital Platform elements that resonate with us include:

- **Codification of experience:** Netcracker's ongoing ability to codify and package its learnings and processes into its platform benefits future customers. This becomes a distribution mechanism for the best practices it has developed with today's leading CSPs in cutting-edge efforts across CX improvement, operational efficiency, and platform and business model innovation. Netcracker's ongoing success will depend on its ability to set the right abstraction, maintaining a blend of standard modules while allowing per-CSP customization for differentiation.
- **Significant investment in supporting 5G and related services:** Netcracker's flexible monetization and business model support bodes well for replacing legacy billing systems as carriers seek to innovate their businesses to recoup the tens of billions spent upgrading their wireless infrastructure from core to transport to RAN. And Netcracker's non-RT RIC and Open RAN efforts telegraphs its commitment to 5G innovation.
- **Enablement for vertical strategies:** Much of 5G's value in public and private networks will be realized within select industry verticals. Making it easier for CSPs to collaborate with solution partners on verticals-based go-to-market efforts and supporting flexible business models (B2B2X) helps achieve fast ROI for 5G buildouts.
- **Focus on improving CX:** Web and mobile applications are going from customer retention to delighting customers. Netcracker's inclusion of technology and components (AI/ML, analytics) to power the next level of customer experiences and engagement enables self-support, upselling and cross-selling, and proactive customer support.
- **Verified compatibility with private and popular public clouds:** For back-office, network operations, and edge workloads, Netcracker's support for multiple clouds expands CSP options and helps retain platform flexibility.

SELECT NETCRACKER DIGITAL PLATFORM CUSTOMERS AND DEPLOYMENT HIGHLIGHTS

Rakuten	• New MNO launch • Mobile-first experience with all digital self-onboarding support • Cross-industry loyalty program
etisalat	• Domain orchestration for 5G services and slicing • Automation of 5G services and slices within a multivendor environment • Orchestration of cloud-native core with distributed functions at the edge
T-Mobile	• Multi-tenant IoT/MNVO monetization solution • Massive data volume processing and high scalability • Fast partner onboarding to enable rapid business expansion
vodafone	• Vodafone Oman: Cloud BSS deployment to deliver digital-first customer experience • Foundation for Vodafone's BSS2Cloud initiative • Personalized customer engagement across all digital channels
zain	• Full stack BSS/OSS transformation • Digital-first experience and personalized marketing campaigns • 5G monetization and operations
du	• Digital transformation including replacement of legacy BSS systems • Monetization of 5G slice-based use cases • Partner ecosystem monetization
ER-TELECOM	• Full Stack BSS transformation for B2B Business • E-Commerce for telecom and digital services • Support of different brands
T-Mobile	• T-Mobile Netherlands: Full stack BSS transformation to support IT consolidation from acquired businesses • Deployed on AWS and leverages Agile/DevOps
vodafone	• Vodafone Spain: Full stack BSS transformation • E-Commerce for telecom and digital services • Omni-channel experience
dish	• Automates 5G transport, interconnect and data center connectivity • Single stack digital BSS/OSS cloud solution • Hosted on public cloud

(Source: Netcracker)

- **Support for and positioning around CSP self-sufficiency:** Addressing CSPs' fear of lock-in and lack of in-house cloud expertise, Netcracker's training, consulting, and sharing of best practices should allay concerns while establishing more robust partnerships with CSP teams.
- **Scaling mindset:** A bias towards declarative, intent-based configuration and management, coupled with the use of AIOps for assistive support for operators, and analytics to provide rapid insights into system and user data show an understanding of the importance of scale. With 5G, distributed systems, including edge platforms, will require effective orchestration and management: Netcracker's platform appears to be gearing up towards that eventuality.
- **Focus and investment into security and privacy:** With today's emphasis on breaches, ransomware, and privacy, Netcracker has engineered and implemented a robust security framework consisting of technical and operational enhancements designed to protect its customers' data and infrastructure.
- **Availability of a comprehensive SaaS offering:** The extensive OSS/BSS capabilities available without a big lift on the CSP's part are helpful in time-to-market and provide fast adoption while CSPs collaborate with the vendor on customization and new features.

Netcracker Digital Platform represents a platform expansion from its 2020 release and a comprehensive go-to-market vehicle that addresses vital needs of today's CSPs in transition to their "better digital future selves." A combination of codified best practices and learnings, modularized technology, agile workflows coupled with training, education, and development partnerships appears to be what CSPs are seeking. We at AvidThink see much to like, and the strong slate of CSP adoptees speaks to market demand and viability for the platform.

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