Digital BSS Strategies for Software-Led Telco

TECH mahindra

Abstract

Technology advances in cloud computing, 5G, IoT, SDN/NFV are creating novel opportunities for communication service providers (CSPs), giving rise to new revenue generation streams which they have not ventured into before. CSPs have already missed out on capitalising on opportunities created by the mobile internet and the gig econonmy, which led to a shift in value within the communications industry in favour of the OTT players and leaving CSPs with the hard questions on how do they monetize their network and customer assets. We see that CSPs are strategizing to take the pole position this time around and maximize their revenues by scaling horizontally by shaping up new business models, developing innovative partner ecosystems and creating operational efficiencies by leveraging AI/ML. Even if CSPs get this strategy right, the path to execution can be fraught with operational challenges and tactical complexities.

This paper aims to reflect upon the technology and industry trends disrupting B2C, B2B and Wholesale business models for CSPs. It dwells on the strategies that CSPs shall be adopting in response to these changes, especially with respect to their core BSS capabilities required to adapt to these disruptions by a structured approach and initiatives to get to the target state BSS.

Key Takeaways

Industry Trends

Based on multiple sources of trendsetters such as TMForum and other industry leaders, there are a few top trends shaping the telecom industry[1]. The worldwide market for telecommunications services totals around $1.5 trillion. B2C revenues overall have been declining by around 1.5% annually over the last three years and that B2B revenues were flat even before the COVID-19 pandemic started in 2020. CSPs' investments point to an industry-wide belief that the revenue growth in the next decade or so will not just come from CSPs' traditional connectivity business, B2C markets, or from traditional B2B offerings, but it will majorly come from digital lifestyle offerings and new B2B, B2B2X services bundled with connectivity and provided not just as providers of generic connectivity, but as aggregators of desirable capabilities that they can retail in the form of market-ready solutions to their existing or new enterprise customers.

Newer technologies like 5G, cloud, and edge offer CSPs the chance to move beyond connectivity solutions and explore unique value propositions via a wide variety of digital service and innovation enablers. 5G is an inflection point for all industries and a gateway to new markets for CSPs. At the same time, cloud is changing business models and lowering barriers to entry while edge enables the quick delivery of contextual services, with a personal touch. Cloud will modernize the conventional technologies and provide CSPs with more business agility. Leveraging cloud, they can venture into new business models to generate new lines of revenue and offer horizontal services. It will enable CSPs to focus on creating platform-based ecosystem, using 5G and MEC technologies to serve new services in B2B area where low latency is a major KPI.

Technology evolution and potential it unlocks for telcos is as described below.

Technology Evolution	Potential Unlocked
5G (eMBB, URLLC, mIOT)	Immersive experience, new revenue segments from three roles telcos could play – service creators, service enablers, network developers
IoT (M2M, Wearables, Security, Healthcare)	Telcos can leverage improved performance, availability, absolute scalability, interoperability, data analytics functionalities from IoT
Blockchain (Partner Relationships, FinTech, NFTs)	Enable better tracking of customers' activity and better provisioning of services for the customer, fraud management and prevention, avoid roaming fraud, 5G enablement
SDN/NFV (Closed-loop Hybrid Network Management, Service Assurance)	Dynamic creation and migration of virtual network functions increases **service agility** and **innovation**
Experience (Metaverse, XR, Immersive Shopping)	Borderless commerce, mass personalization, online shopping through augmented reality
Cloud, Microservices (Cognitive, Automation, Agile, DevSecOps)	Business agility, zero touch operations, hyper personalization, enhanced trust, and reliability

Table 1: Technology Evolution

Some leaders in telco space are building upon open API marketplaces that can solve customer problems, faster and at scale, with the promise of generating plethora of new opportunities, partnerships and possibilities at much lower costs as compared to creating new services or offerings themselves.

What Telcos Should Do: The Shift from Traditional to Software-led

In the process of becoming software-led, telcos need to simplify their experience, products processes and technologies used in their core systems. Telcos should have an overall simplification of customer/partner journeys and commercial model to provide personalized experience. They also need to be digital-first in the sense that onboarding and care journeys need to be zero touch, and for this to happen their processes will have to be lean, applications be cognitive and infrastructure should be cloud based, open architecture centric, and virtualized.
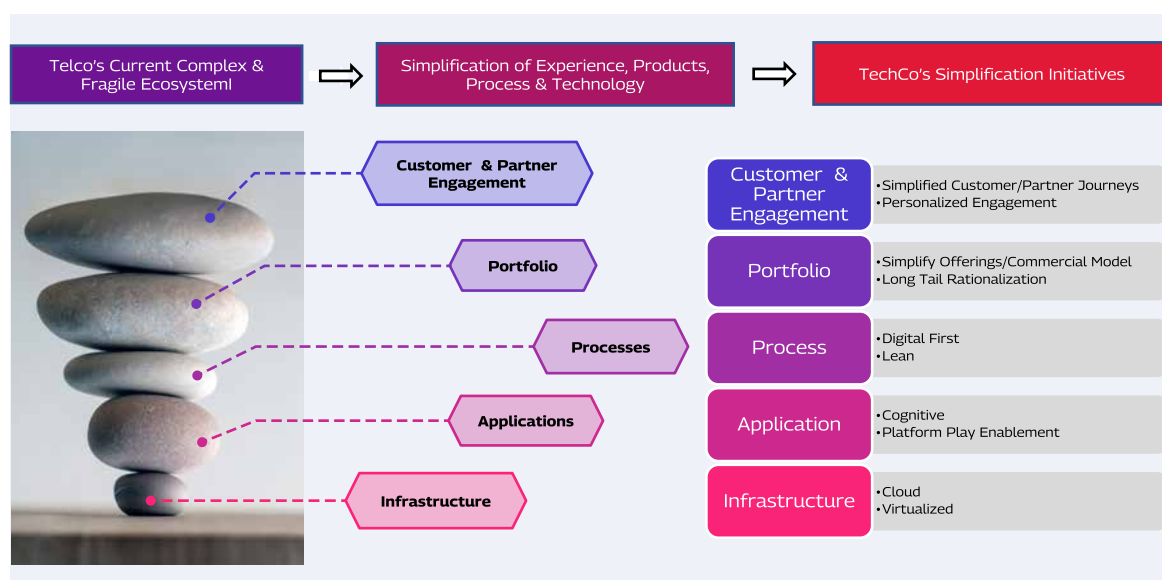
| Telco's Current Complex & Fragile EcosystemI | ⇨ | Simplification of Experience, Products, Process & Technology | ⇨ | TechCo's Simplification Initiatives |

Telco's Current Ecosystem	TechCo's Simplification Initiative	Details
Customer & Partner Engagement	Customer & Partner Engagement	• Simplified Customer/Partner Journeys • Personalized Engagement
Portfolio	Portfolio	• Simplify Offerings/Commercial Model • Long Tail Rationalization
Processes	Process	• Digital First • Lean
Applications	Application	• Cognitive • Platform Play Enablement
Infrastructure	Infrastructure	• Cloud • Virtualized

Figure 1: Software-led Telco Simplification Initiatives

Telcos need to Imagine, Build, and Run innovatively to stay relevant and competitive as they move towards a software-led telco.

Imagine - With the changing nature of business, telcos will need to address new customers and new market segments to tap revenue growth from new business or address new offerings to the existing customer and market segments through higher value bundles.

By assuming a role of software-led telco in the ecosystem, telcos can address at least $700 billion in new revenues from industrial 5G and B2B2x opportunities, by leveraging open standards and common interfaces such as TM Forum's Open API suite and embracing Open Digital Architecture (ODA) patterns.[2]

Build - Experience is the new differentiator and unlike the connectivity business, it is difficult for telcos to generate incremental revenue through upsell/cross sell if customers are not hooked to the experience offered throughout the lifecycle (learn, buy, get, use, pay, support). Similarly, business agility and response to changes is the key factor in maintaining the pole position in competitive market.

To achieve this, software-led telcos, shall need to reorient, and adapt enterprise agile ways of working that are self-sufficient in designing and implementing the changes in their respective tribe function (e.g., marketing, sales, front end/channels, product catalog). Most of the telcos have already (or are on the path) of aligning to the TMF ODA frameworks introducing digital/agility layers offering omni-channel experiences over back-end silos of CRM and billing solutions. Software-led telcos, as part of their transformations, are insisting on conformance to TMF Open API specification and enforcing SaaS / COTs providers and system integrators to build wrappers over native API to align with the same. This ensures business agility and faster response times to changing market scenarios cutting down on the cycle time of changes to existing products, introducing new products/bundles, tariff plans, devices, and third party catalog integrations seamlessly.

Run - Telcos need to achieve operational efficiency to reduce costs in the traditional business and use those savings to invest in the new business. Automation, AI/ML based prediction, self-healing and closed loop algorithms are enabling cognitive capabilities required for improving operational efficiencies. To achieve this maturity with operational efficiencies driven by technology, many Telcos need to partner on adopting and implementing new AIOps platforms, toolsets, chatbots, business process automation of established value chains. Consequently, they need new frameworks and IT concepts that are extremely flexible and agile, allowing them to pivot rapidly, pursue new opportunities and interact easily with the ecosystem.

To summarize, software-led telcos will be able to leverage technology and network evolution to rapidly reinvent their business models and re-imagine the customer experiences.

Capabilities required to become a software-led telco are shown in Figure 2.

Figure 2: Software-led Telco Capability Map
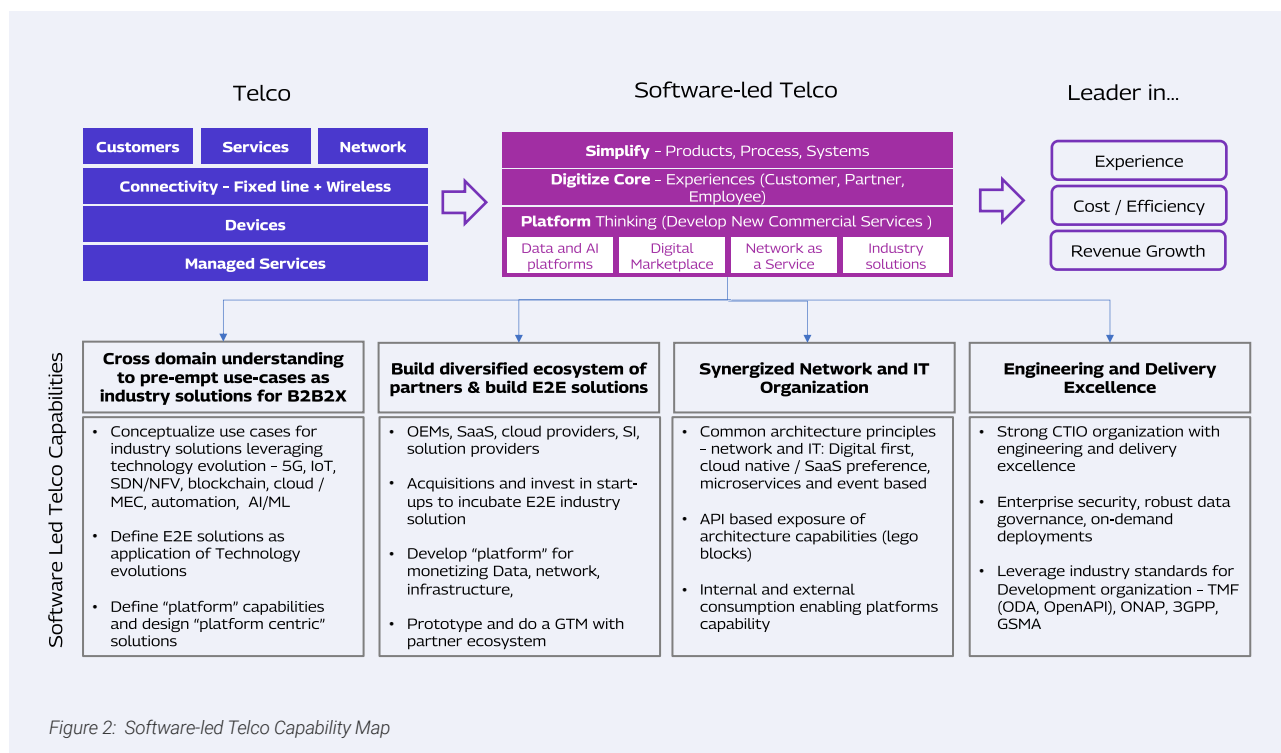
A software-led telco re-orients strategy towards platformization of their assets viz data, network connectivity, partner ecosystem, multi-sided business models. They need to think in terms of platform economy or platform play and digitize their core from experience standpoint for which they need to take on once-in-a-generation challenge, simply products and services, reinvent their operating model and processes, go-to market strategies, partnerships, company, and resource culture; essentially digitize the core of their way of operating to enhance seamless customer experience. Making this change will make telcos the leaders in experience, cost efficiency and revenue perspective.

Tha cababilities required for software-led telcos could be divided into four broad areas such as—

- ▶ **Cross domain understanding:** To enable this change, need of the hour is to conceptualize and implement B2B2X use-cases leveraging the technological trends such as 5G, IoT, SDN/NFV, Blockchain, MEC/cloud, security, Fintech and digital services. New age services will evolve to be more complex such as providing an enterprise communications suite or platform centric solutions for a single company. Investing into gaining insights and deep understanding of the cross-domain industry and their ecosystems to conceptualize this use-cases is therefore critical to succeed as a software-led telco.

- ▶ **Diversified ecosystem partners:** Some services involve telcos delivering the whole bundled solution themselves, but many require them to partner with OEM, SaaS, cloud vendors or an SI parter for creating new service packages or to enter established value chains with new connectivity capabilities. Telcos should be able to quickly develop a solution partnering with players in adjacent industries and design next-generation use cases for long-term value. In essence, building partner ecosystems will be imperative to deliver such complex end to end solutions.

- ▶ **Synergized network and IT:** This paradigm shift will create a need to adopt open, adaptive and software centric architecture. Architecture design principles must be modular, loosely coupled, cloud-native, AI centric and data driven. Such kind of architecture in place will help telcos to achieve objectives like speed to market, digital first, customer first (provide personalized customer experience) and make them a future ready telco.

- ▶ **Engineering and delivery excellence:** This would require telcos to provide enterprise security, robust data governance, on-demand deployments. Hence, adopting to open standards and APIs will be crucial for faster and standard development.

Role of BSS and BSS Capabilities in Enabling Software-led Telco

For transformation to succeed, technological breakthroughs need to be monitored, observed and software-led telcos need to take inspiration from those. Which also means only technological breakthroughs are not sufficient for revenue growth. Telcos need to experiment with these breakthroughs in their context, their experimentation with the new technologies and capabilities is crucial to help them solve their business challenges. To achieve this, Telcos must possess the ability to test new products with their customers and deploy them out rapidly, for example -

Meta does the tests with just 1% of its user base [2], it can test out new applications before scaling up or down as needed. Alongside growing new revenues, Telcos have other solid operational and business reasons as mentioned below to evolve their BSS technologies:

- ▶ **Improvised customer experience –** The expectations of corporate clients have changed, and CSPs must now provide modern IT-centric experiences that are on par with those offered by over-the-top (OTT) service providers and hyperscale cloud platforms. Customer experience and satisfaction is becoming one of the main KPIs by which CSPs measure the effectiveness of their IT strategies.

- ▶ **Better process automation –** The traditional telecommunications connection divisions and new business units of CSPs must spend as little as possible on operational costs to resolve process automation-related problems. Many BSS suppliers help by supporting open APIs and enabling interoperation in a more open ecosystem, which is designed to drive out the faults that lead to order fallout or process breakdown.

- ▶ **Increased Revenue and Lower churn –** CSPs have had success in lowering churn, which is an area of telecom operations that has been extensively examined. However, new service models are likely to generate unknown causes of churn initially. Therefore, customer analytics programs need to have an end-to-end perspective that can link network operations events like service fulfilment to customer complaints and churn.

BSS components which are the most important for addressing current business models and pivoting towards unforeseen services and partnerships include:

	BSS Components	Description	Business Impact
1	Catalog Driven Systems	Catalogs should provide single source of truth about the form and configuration of products, services and assets. Ordering and fulfillment processes rely heavily on the concept of a centralized product/service catalog, so it makes sense for revenue management in the BSS to use the same source of data. For zero-touch service operations to become a reality, catalogs must be able to be retrieved automatically. Catalogs also need to have extensibility to be able to source products/services for third party / suppliers to create marketplace equivalent ecosystems for telco consumers.	Increased Revenue Faster Time to Market
2	Ordering and service fulfillment	B2B clients connect mostly online with their IT service providers. Additionally, since expectations have changed, telcos must quickly adapt the way they collect orders. The goal is to have interactions that are digital-first and platform-style, and legacy order management and fulfilment is changing to support this. This is a major area of attention for enhancing the customer experience and raising Net Promoter Scores because it is a crucial point of contact with business consumers.	Improves Customer Experience Lower Churn

	BSS Components	Description	Business Impact
3	Dynamic rating and charging	API economy, IOT ecosystems, marketplaces, and partnership models may involve large number and wide variety of data connections within a single deployment. The need to rate and charge each connection using different tariffs and policies is fast becoming the game changer as customers seek accurate billing based on demand and usage.	Improved Customer Experience Lower Churn
4	Advanced partner management	CSPs increasingly want to provide zero-touch onboarding for partners such as resellers, suppliers, distributors and wholesalers as new service ecosystems evolves. In the future, B2B2X supply chains may potentially play a role in the creation of commercial partner contracts as they progressively rely on more sophisticated partner management and cross-partner settlement systems.	Increased Revenue
5	Convergent billing	Complex service bundle billing necessitates an end-to-end service management strategy, which is like the streamlining of service orchestration process. A top priority is to get rid of outdated problems like order fallout during the billing phase. Vendors are including features like libraries of executable tasks, AI-driven configuration engines, and customer-centric analytics in the modular structures of future cloud-native BSS to guarantee fault-free operations. Therefore, billing is once again taking center stage.	Low Churn Reduced Operational Cost Improved Customer Experience
6	Customer engagement and experience management	There is a direct impression of redefined enterprise customer experience on customers. With this redefinition, sales can increase. To succeed commercially, telcos will need to communicate more with customers, more than before now that new services are being introduced. Changing only operational aspects of telcos is not enough if customer contact points are not taken care of.	Improved Customer Experience Low Churn

Table 2: Fast Changing BSS Components

Initiatives to Address the Challenges

Telcos around the world are trying to keep up with the pace; leaders transforming parts and pieces of the legacy system, preceding the progression from telco to software-led telco. While lagging telcos are struggling to reduce operational costs of existing platform and increase revenue, several telcos are taking efforts to implemented marketplace, Open APIs, create wrappers around the existing system, federate catalog, consolidate multiple redundant systems, a few are transforming the whole platform from on-prem to cloud for business agility. However, to lead the market, telcos need to not just catch the pace but to forefront software-led telco journey. Core software-led telco themes are identified and elaborated in the following table:

Idea / Offering	Software-led Telco Theme	What it is? KPIs impacted	How?
Lean Telco	Simplify	1. Product Catalog Pruned by 50% + 2. Legacy IT Portfolio Reduction by > 70% 3. Cloud Adoption > 80% of Simplified IT	Strategic product portfolio, process, and target architecture • 80/20 rule and long tail product pruning • Copper to coax / fiber Radical simplification and operating cost savings • Automate (closed loops, self-heal, preventive maintenance) • Data driven insights and predictions
Digital Enablement	Digitize Core	1. Digital Interactions > 80% 2. 0/1 Touch Journeys ~90%	• Launch digital brands • Cloud, SaaS adoption, SDN/NFV adoption • API centricity, • Digital façade with federation, residual legacy abstraction • AI / ML and automation maturity
Marketplace-as-a-Service	Platform Thinking	1. Marketplace Tevenue as % (@ 30% in ~3 years) of Conventional Telco Catalog Service Revenue	• Extended/unified product catalog for selling third party / partner products • Product and service mashups, faster time to market (e.g., Mvno as a service) orchestrated service delivery, fallbacks, settlements with partners
E2E Industry Solution	Platform Thinking	1. Number of E2E Use Cases based Solutions – Proof of Concept 2. Opportunity Pipeline for E2E Solutions ~ 100m USD in Year 1	• Idea to prototypes for B2B use cases (solutions) leveraging 5G MEC, IoT, SDN/NFV and Data/AI platforms • Diverse industry domains: - o E.g., Private/public MEC with 5G slice use-cases for manufacturing / healthcare / retail / banking / insurance and finance / transport

Table 3: Software-led Telco Themes

TechM Service Offerings

Software is going to be at its core in the transformation for telecoms to progress beyond delivering traditional connectivity services. Tech Mahindra offers a comprehensive range of new-age BSS solutions aligned to TMF ODA.

Using a standard framework helps meet business objectives like customer experience, reducing operational cost and time to market, which is where ODA plays an important role. It is an open, modular, software-based, cloud-native and loosely coupled IT reference model, that facilitates data driven operations. At Tech Mahindra, the digital BSS practice has created an instance of the TMF ODA for the digital BSS reference architecture in Figure 3.

Digital BSS - Reference Architecture (Aligned to TMF ODA v5.0.1)

Self Service Channels
(Web, Apps, Social, Bot, PVA, Wearables)

Assisted Channels
(Call Center, Chat, Stores, Partners)

Things

Systems of Engagement
Assisted & Un-Assisted Channels

| Apps, Web, (B2C) | Apps, Web, (B2B) | Digital Interactions (Bot, Chat, Social, Messaging) | Digital Infrastructure (Web Analytics, CMS, A/B Testing, Journey Manager, Knowledge Management) | IVR/CTI | Assisted Channels UI | APIs |

Decoupling & Integration (D&I) – API Gateway, Data Fabric, Micro-Services Platform Infrastructure

Party Management

Marketing & Campaigns	Lead & Opportunity Management	Customer Management
Salesforce Automation	Commissions	Partner Management
Party Identity & Access	Payments	Billing & Settlements
Collections	Revenue Assurance & Fraud	Consent Management

D&I

Core Commerce Management

Product Catalog	Commerce	CPQ (B2B)
Next Best Offer	Next Best Action	Contract Management
Care / Case Mgmt	Order Orchestration	Loyalty / Gamification
Charging	Policy Management	Market Place

D&I

Production (BSS)

Number / SIM Inventory	Retail Inventory & Logistics
Voucher Management	Document Management
Internal Integrations	External Integrations
Mediation	

Decoupling & Integration (D&I)

Systems of Insights

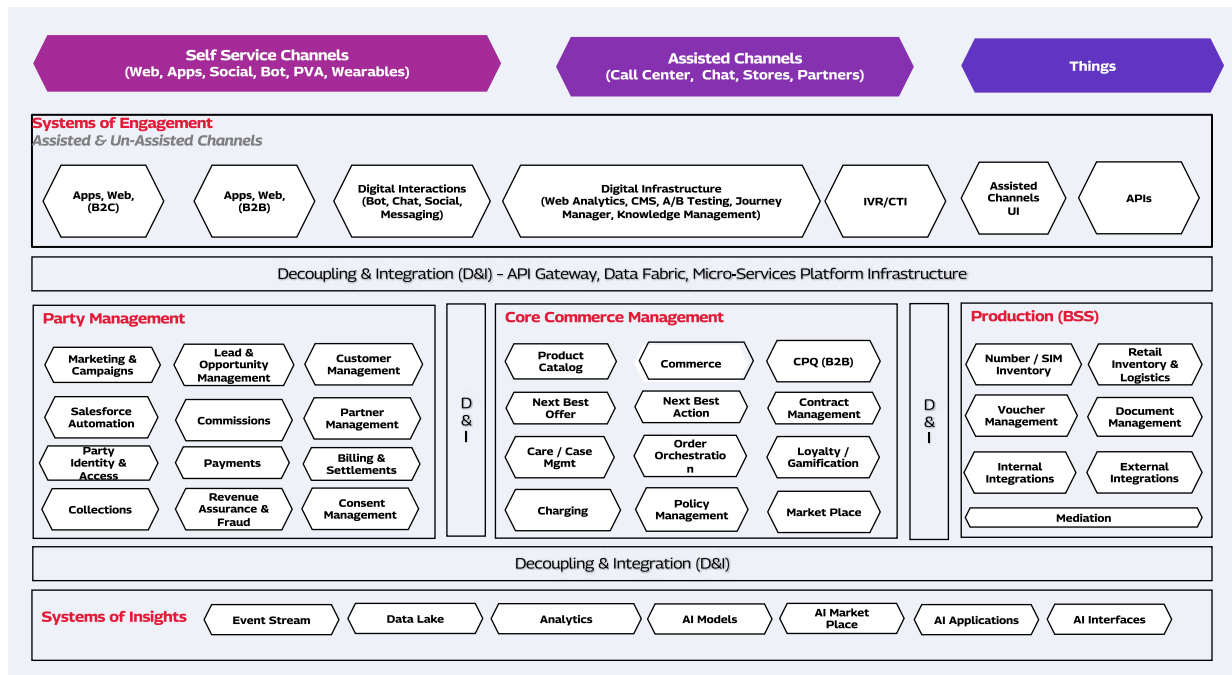| Event Stream | Data Lake | Analytics | AI Models | AI Market Place | AI Applications | AI Interfaces |

Figure 3: Tech Mahindra Digital BSS reference architecture aligned to ODA

TechMahindra provides end to end services such as digital transformation solution for B2B and B2C businesses, 5G monetization offers, service offerings to help teclos launch their digital brand and markteplace solutions as part of which TechM offers services like CRM, billing, order management transformations. Services offered are microservices based, Open API centric, lean and loosely coupled architecture based. Offerings map is as follows:
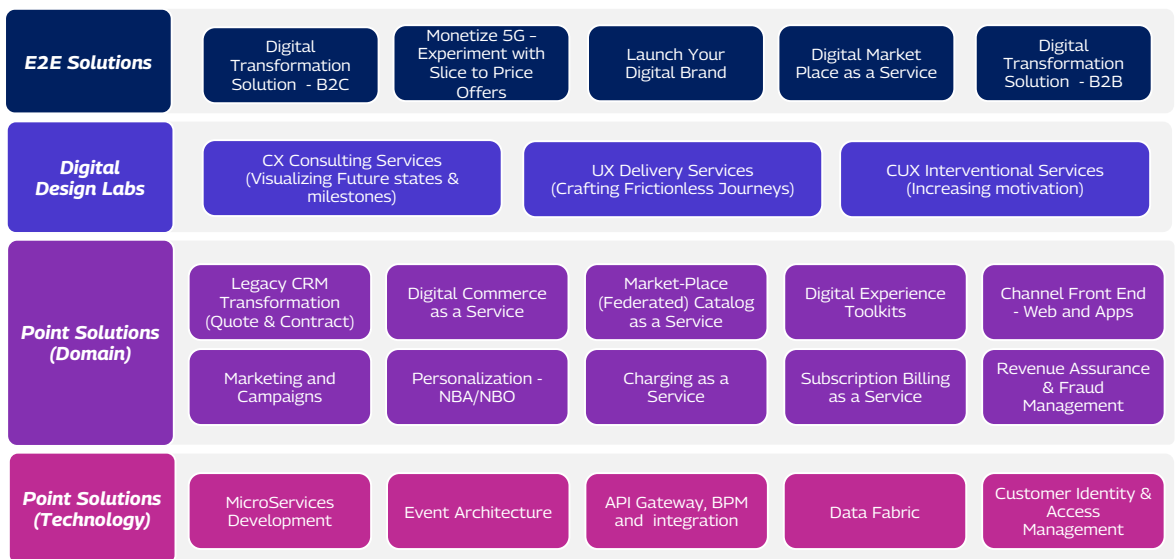
E2E Solutions	Digital Transformation Solution - B2C	Monetize 5G – Experiment with Slice to Price Offers	Launch Your Digital Brand	Digital Market Place as a Service	Digital Transformation Solution - B2B
Digital Design Labs	CX Consulting Services (Visualizing Future states & milestones)		UX Delivery Services (Crafting Frictionless Journeys)		CUX Interventional Services (Increasing motivation)
Point Solutions (Domain)	Legacy CRM Transformation (Quote & Contract)	Digital Commerce as a Service	Market-Place (Federated) Catalog as a Service	Digital Experience Toolkits	Channel Front End - Web and Apps
	Marketing and Campaigns	Personalization - NBA/NBO	Charging as a Service	Subscription Billing as a Service	Revenue Assurance & Fraud Management
Point Solutions (Technology)	MicroServices Development	Event Architecture	API Gateway, BPM and integration	Data Fabric	Customer Identity & Access Management

Figure 4: Tech Mahindra Service Offerings

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Abbreviations

Abbreviations	Definition
CSP	Communication Service Provider
Telco	Telecommunication Operator
TMF ODA	TMForum Open Digital Architecture
BSS	Business Support System
B2C	Business to Consumer
B2B	Business to Business
B2B2X	Business to Business to any end user
API	Application programming interface
CX	Customer experience
UX	User Experience
NBA/NBO	Next Best Action/Next Best Offer
CRM	Customer Relationship Management
E2E	End to End
SDN	Software Defined Network
NFV	Network Function Virtualization
eMBB	enhanced Mobile Broadband
URLLC	Ultra-Reliable Low Latency Communications
mIOT	manufacturing Internet of Things
Blockchain NFT	Non-Fungible Token
MEC	Multi access Edge Computing
MVNO	Mobile Virtual Network Operator
AI/ML	Artificial Intelligence/ Machine Learning
OEM	Original Equipment Manufacturer
SaaS	Software as a Service
ONAP	Open Networking Automation Platform
3GPP	3rd Generation Partnership Project
GSMA	Global System for Mobile communications Association
GTM	Go to Market Strategy
KPI	Key Performance Indicator

Authors

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