

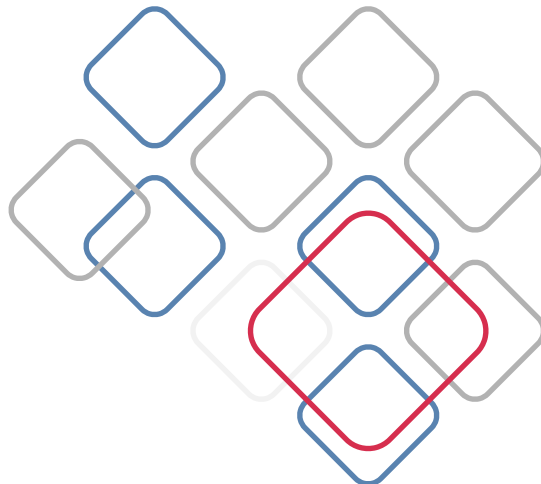


Telco Republic

Whitepaper

Product Lifecycle Management (PLM) and Enterprise Product Catalog (EPC) in CSP Digital Transformation A Business Perspective

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In collaboration with



Executive Summary

Strategic investments in catalog-driven infrastructure will be the core of any communication service provider's (CSP's) digital transformation. These investments allow agile management of the lifecycle of all future services, whether they are cognitive, transactional or interaction-based.

The CSP of the future will leverage its product lifecycle management (PLM) and enterprise product catalog (EPC) solutions to incorporate internal and external innovation from partner ecosystems.

Key Takeaways

- CSPs invest in agile PLM and EPC to **raise new revenue** from 5G and IoT services.
- PLM and EPC **support CSP digital transformation** by accelerating time to market, improving operational efficiency and enhancing the customer experience.
- PLM and EPC let CSPs **manage, create and bundle complex products and services** across multiple internal and external channels for enterprises and small to medium-sized businesses (SMBs).
- A **centralized EPC** allows CSPs to compose complex digital services by transforming the entire quote-to-install process delivered through multiple sales and service channels.
- Catalog-driven, quote-to-order fulfillment is a **collaborative, closed-loop operational tool** that helps break down traditional boundaries between the CIO, CTO and chief marketing officer (CMO) by providing a holistic view of resources.
- CIOs view **real-time, agile, digital IT solutions** as essential strategic investments that facilitate effective product design and sales processes for digital business models across multiple channels and digital partner ecosystems.

Recommendations for CSPs

CSP decision-makers should consider the following recommendations:

- Position your company as **an enabler of business and technology transformation** for end-to-end process alignment, from lead generation, quote creation, pricing, business rule configuration, order fulfillment and service delivery, by leveraging your PLM and EPC solutions.
- **Unify cross-channel architectures** within your organization to deliver a flexible, on-demand customer experience by facilitating competitive offering bundling, pricing and configuration, and by reusing enforcement logic and dynamic service modeling across all customer channels.
- Broaden **holistic, digital customer and service layer transformation** solutions through business, operational process and organizational change management.

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PLM and EPC in CSP Digital Transformation Journeys

CSPs have been transforming themselves since the deregulation of the industry. The timing and pace of deregulation differs from country to country. It typically involves the rise of competitors within the industry, including local, long distance, fixed-line and mobile providers. Following this comes competition from adjacent industries such as ISPs, OTT players, hyperscalers and other players.

The loss of monopoly status compelled CSPs to transform all aspects of their organization, including customer interactions, business and IT strategies, the use of technology, operational models, organizational culture as well as the use of data and data governance.

Telecommunications has been digital since its inception, rendering the term “digital transformation” somewhat redundant.

However, the term “digital transformation” has been commonly used since the mid 2010s across all industries, whether digital-native or not, to describe **an organization-wide overhaul of customer experience, data-driven insights, cross-industry collaboration and partnerships, network virtualization, process automation and agile methodologies.**

New Opportunities in the 5G, IoT and the Enterprise and SMB Sectors

For CSPs, digital transformation is a journey with constantly moving goalposts, due to factors such as micro- and macroeconomic conditions, market and competitive dynamics, end-user requirements, regulation, technology advancements, changes in suppliers and supply chains and more.

The advancement of 5G and IoT has moved the goalposts again, challenging CSPs' operations and strategic goals with an ever-increasing number of new services and use cases.

CSPs are currently shifting their focus from the sluggish consumer market to the enterprise and SMB sectors, as these industries offer greater revenue prospects.

PLM and EPC are essential in this journey from a commercial, business, technological and architectural perspective.

This research note focuses on the commercial and business aspects of PLM and EPC in CSPs' digital transformation.

To demonstrate how PLM and EPC contribute, we combined two complementary industry models to explore the “how” and “what” of digital transformation.

- The Four Pathways model from the MIT Center for Information Systems Research (MIT CISR) shows **how CSP can achieve digital transformation.**
- The TM Forum's Digital Maturity model illustrates **what CSPs must do to achieve digital transformation.**

How CSPs Can Achieve Digital Transformation

CSPs can choose from four options to transform themselves into “future ready” organizations, as per MIT CISR's Four Pathways model.*

The **starting point** is the *Silos and Spaghetti* state, where CSPs have a complex and poorly integrated mix of legacy and modern processes, systems and data. In this state, the product, not the customers, drives the processes and systems.

The **goal** is to reach the *Future Ready* state, where CSPs offer their customers an exceptional experience with innovative and high-value products and services. In this state, the IT architecture is modular, agile and ready to participate in wider ecosystems.

Intermediate states are the following:

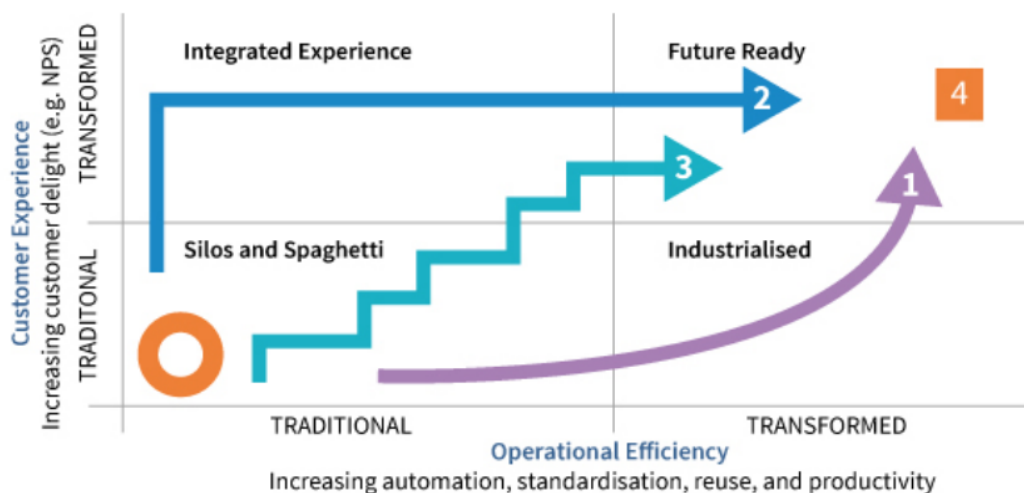
Integrated Experience, where CSPs offer their customers an integrated omnichannel experience with a single intuitive user interface.

Industrialized, where CSPs have a plug-and-play IT architecture governed by a single source of truth, clearly defined KPIs and an optimized approach of executing tasks.

CSPs should choose the pathway best suited to their requirements based on the quality of customer experience they currently offer.

Very large organizations can choose multiple pathways simultaneously. However, these must be well coordinated to avoid duplication and redundancies.

Figure 1. The Four Transformation Pathways to Future Ready



Source: MIT CISR

*For details, see: “Four Pathways to ‘Future Ready’ that Pay off,” *The European Business Review* (March 23, 2019).

The Quality of Customer Experience Determines Which Pathway to Choose

CSPs with Average or Above-Average Customer Experience



CSPs with average or above-average customer experience should choose pathway 1.

Pathway 1 allows them to reuse existing processes, structures and technologies by developing API-enabled business services, discarding legacy systems and processes and adopting new technologies such as virtualization, cloud computing or microservices.

CSPs with Poor Customer Experience



CSPs with poor customer experience should choose pathways 2, 3 or 4.

Pathway 2 takes measures to quickly improve the customer experience, initially at the expense of operational efficiency, while complexity remains high for a considerable time.

Pathway 3 ensures quick fixes for poor customer experience on a limited scale.

This pathway follows an iterative approach, alternating between enhancing customer experience and improving operational efficiency.

Pathway 4 is ideal for CSPs that need a complete reboot to survive by building an entirely new organizational and technology stack.

CSPs typically create a digital division or standalone organization that is later merged with the parent company.

Image Attribution: Vecteezy.com

PLM and EPC Help CSPs Achieve Their Digital Transformation Goals

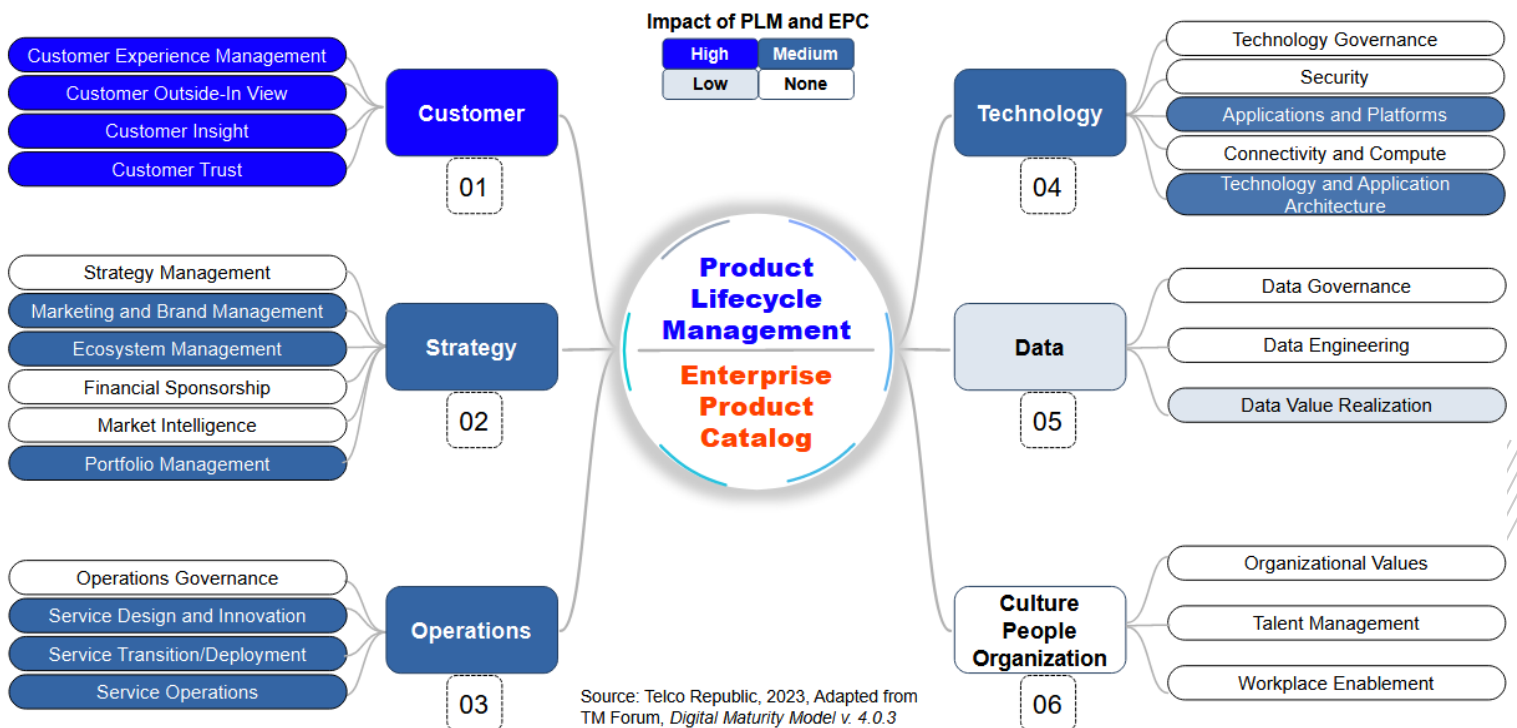
CSPs will prioritize different transformation journeys based on their preferred transformation path. CSPs should consider six transformation journeys that consist of 25 related sub-journeys. Each journey has its own maturity model consisting of five levels, as shown in Figure 3. The maturity level of each transformation journey will vary based on the selected pathway. As a CSP approaches the state of being “future-ready,” it should align all journeys for maximum impact.

CSPs with **poor customer experience** that select pathways 2, 3 and 4 will place PLM and EPC **at the center of their digital transformation.**

CSPs with **average or above-average customer experience** that select pathway 1 should consider PLM and EPC as **tools to enhance efficiency** along with other tools, including network and inventory management, service and resource management, security and provisioning.

PLM and EPC are closely linked to five of the six transformation journeys and to 13 of the 25 sub-journeys, as shown in Figure 2.

Figure 2. EPC and PLM in CSPs’ Digital Transformation Journeys



PLM and EPC in CSP Digital Transformation Journeys

01 Customer Transformation Journey

- CSPs provide an optimal **customer experience** through various of channels and intuitive user interfaces.
- **Customer requirements**, not product specifications, drive all interactions.
- **Customer behavior, interactions and properties** feed back into product improvements and launches.
- The company and product **brand perception** align with customer experience.

02 Strategy Transformation Journey

- CSPs develop and maintain a consistent **brand perception** across all channels.
- CSPs can **seamlessly integrate** third-party products into its own product portfolio.
- It is easy to maintain a **balanced portfolio** designed to maximize revenues and profitability, considering the varying lifecycles of its individual components.

03 Operations Transformation Journey

- CSPs can **easily design and develop** innovative products and services composed of their own and third-party offerings.
- It is easy to **launch, deliver and retire** services in response to changing user and market conditions.
- CSPs ensure that services are **widely available and of high quality**.

04 Technology Transformation Journey

- PLM and EPC conform to the latest technologies, including **virtualization, cloud computing, microservices** and others.
- The PLM and EPC solutions are **modular and easily integrate** with other solutions through open APIs.

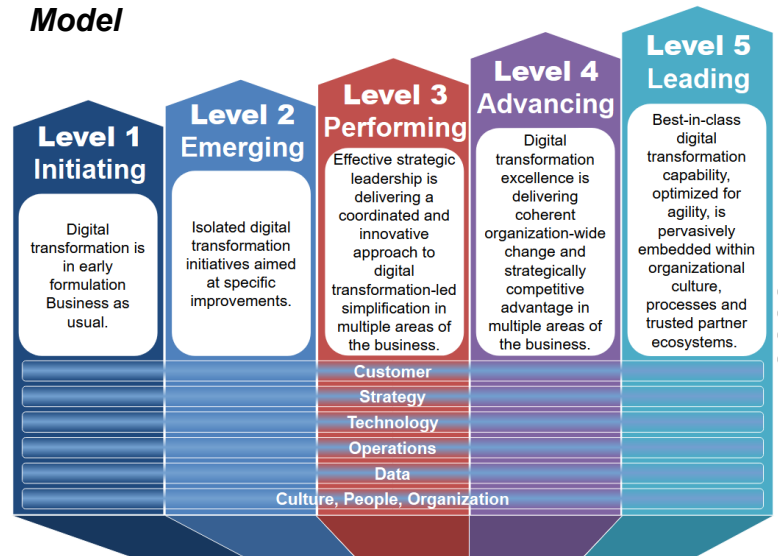
05 Data Transformation Journey

- Data from PLM and EPC is **available to other systems**, such as CRM, partner management, service management, resource performance management, finance, revenue assurance, billing, etc.

06 Culture, People and Organization Transformation Journeys

- PLM and EPC do not play any significant role in the journey.

Figure 3. Digital Transformation Maturity Model



Adapted from TM Forum, Digital Maturity Model v. 4.0.3

PLM and EPC Support the Transformation from Telcos to TechCos

CSPs Must Manage the Transition From Telco to Techco

In the digital economy, CSPs are under increasing pressure to enable and deliver new, more complex and multifaceted business models. The rise of 5G and IoT is driving an ever-increasing number of new services and use cases, mainly in the enterprise and SMB sectors.

PLM and EPC Challenges Facing Traditional Telcos

Capitalizing on these new opportunities strains CSPs' OSS and BSS infrastructures, because their internal infrastructures and customer channels remain fragmented, leading to poor customer satisfaction with suboptimal profitability and margins.

CSPs typically have dozens of catalogs within their BSS and OSS systems and cannot easily quote, order and bill for their own and third-party solutions that they want to include in their offerings.

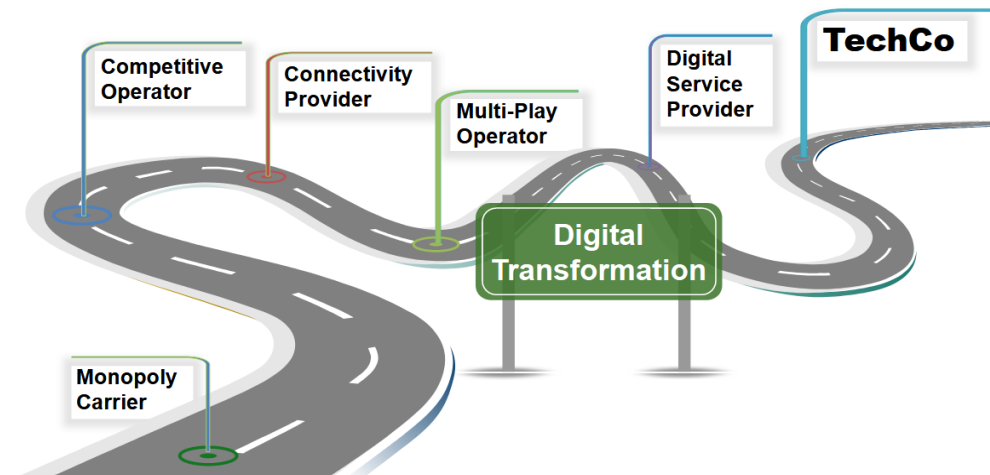
Slow time-to-market and long lead times for product and pricing changes result in misalignment of product and service offers with market requirements.

CSPs lack visibility into product performance and face high implementation and maintenance costs due to the lack of a standardized model and the replication and re-implementation of rules throughout their backoffice solutions.

To address these challenges and to better serve the enterprise and SMB markets, CSPs are shifting gears to become "techcos," investing in new infrastructures to embrace internal and external innovation.

TechCos represent the evolution of CSPs from operators that outsource much of their IT operations to organizations that operate and manage their own digital infrastructure, spanning across partner environments.

Figure 4. The Journey from Telco to TechCo



Source: Telco Republic, 2023

New Business Models and Composite Services

Techcos are developing business models that go beyond traditional network-based CSP business models.

New models include digital and composite products and services, often with multiple touchpoints outside the organization.

In the digital 5G and IoT economy, third-party digital content providers, customers and partners become part of a CSP's product lifecycle.

CSPs must compose multiple internal communications services and software products and combine them with external offerings into cohesive bundles.

Creating a cohesive bundle requires PLM and EPC capabilities that orchestrate the different lifecycles of internal and external components into a bundled offering with its own lifecycle.

CSPs need to manage the creation, sale and implementation of composite and digital products in a unified way across multiple channels and lines of business to improve operational agility, improve service lifecycle management and time to market.

Key spending drivers for PLM and EPC are orchestration infrastructures for digital content, B2B, enterprise services, IPTV, mobility and machine-to-machine (M2M) across multiple channels.

Delivering Value Across Digital Ecosystems

Heterogeneous digital services require orchestration across multiple internal CSP divisions and across the value chains of multiple external partners.

This evolution triggers CSPs' IT modernization initiatives that drive digital product innovation and customer experience across increasingly complex, convergent environments and extended ecosystems.

PLM and EPC are at the Core of CSPs' New Capabilities

PLM and EPC touch many solutions, processes and departments within CSPs, including customer management, strategy, front- and backoffice technologies, operations and data management, as shown in Figure 2.

PLM and EPC help CSPs prioritize streamlined solutions that enable proactive and dynamic creation of product and service bundles, accurate quoting and pricing, with an embedded catalog that invokes order and service fulfillment.

The complexity of managing services across the digital value chain and convergent technologies will increase significantly as 5G matures and evolves to 6G.

The uptake of self-service, product personalization and contextualization requires a customer-centric operational view of product availability and eligibility information.

PLM and EPC align customer-centric operational resources and ensure that they are delivered to the appropriate channels at the right price.

Implementation Drivers

CSPs are investing in PLM and EPC as part of their multichannel, lead-to-quote-to-order-management initiatives to achieve the following objectives.

1. Manage the complexity of the product lifecycle and service creation across multiple new digital value chains.

CSPs can deliver heterogeneous products through different sales channels, partner segments and digital value chains, create complex product bundles and offer pricing and discounts.

2. Achieve internal alignment of the CIO, CTO and CMO organizations.

A centralized EPC coupled with PLM provides a collaborative tool for the end-to-end management of products and services, resulting in strategic and operational alignment as well as improved customer management.

3. Introduce hybrid orchestration architectures beyond a single product set.

CSPs can bundle communications services with physical goods, digital instances, IT services and third-party products and services to create innovative offerings.

4. Manage the growing number of partners and sales channels.

PLM and EPC ensure the common exposure of data across channels in a cost-effective, repeatable manner while allowing for channel-specific tailoring without customization.

5. Improve the customer experience.

PLM and EPC improve the accuracy, availability and compatibility of product offers, provide insights into product performance at the product capability level and align product performance with target business-case metrics.

Definitions: PLM and EPC

Product Lifecycle Management (PLM)

PLM is the process of managing the entire lifecycle of a product from inception, through engineering design and manufacture, to service and disposal of physical or digital products.

PLM integrates people, data, processes and business systems and provides a product information backbone for companies and their extended enterprise community, including marketing, product management, sales, engineering, advertising, regulatory, finance, customer service and support.

Key Capabilities

- **Manage the Entire Product Lifecycle**
Seamlessly handle the changing scope and scale of the logistics, workflow, resources and financial objectives through the entire product launch process.
- **Reuse Existing Assets**
Harness existing processes, procedures and resources.

- **Accelerate Qualification for Sales and Revenue Contributions**
Identify sales potential and forecast in-situ throughout the product lifecycle with prototyping, pilot and trial process management.
- **Maximize Supply Chain Collaboration**
Enable proactive processes that allow all stakeholders, sponsors and consumers to interact throughout the product lifecycle.
- **Ensure Quality and Reliability at Every Stage**
Proactively manage processes throughout the lifecycle.
- **Standardize Framework for Product Optimization**
Leverage proven repeatability and process standardization to improve quality and cost management.
- **Integrate with Existing Assets** (process management and catalog applications) to elevate and accelerate business priorities and digital transformation.

Enterprise Product Catalog (EPC)

EPC management is the process of managing the entire repository of all products and services including product definitions, bundles, varieties, specifications, rich content and pricing.

The EPC brings together essential catalog items, attributes and eligibility rules under a single unified solution, ensuring quality, efficiency and visibility across the enterprise.

The EPC provides a 360 degree view for commercial (sales channels), technical (provisioning and fulfillment) and billing transactions.

Key Capabilities

- **Assemble and Define Product Details**, including descriptions, rich content and specifications.
- **Accelerate Launches** by reusing existing offerings with links, duplication and importing catalog products.
- **Configure Complex Pricing** for products and customer segmentation.
- **Apply Taxation Rules and Shipping Methods** for the global market.
- **Integrate** with third-party channels and enterprise support systems (BSS and OSS).

How Kloudville Helps CSPs Succeed



Kloudville PLM/EPC 360 offers CSPs an end-to-end product lifecycle automation tool with a flexible master catalog that propagates product and service data to all new and legacy systems, supporting any B2B and B2B2X scenario.

EPC/PLM 360 provides processes automation, from product ideation through launch and retirement of products and services for faster creation and deletion of products for a successful marketplace model.

It includes a flexible master catalog to propagate product and service data to all new and legacy systems.

EPC/PLM 360's out-of-the box automation supports business process and catalog-driven quotation and ordering orchestration.

It supports goods, services, digital/partner products, sales, rentals, subscriptions, price overrides, costing and margin analysis (with approval workflows) and integrates to SFA platforms and other CPQ solutions, for example for B2C.

With EPC/PLM 360, CSPs gain 360 degree visibility into customer profiles, opportunities, quotes, orders, contracts, cases, subscriptions, billing, projects, appointments, interactions and notes.

Key modules include:

Full Costing Module

Enables visibility into profitability and pricing and broad pricing and costing support, including fixed, quantity, contract and attribute-based pricing.

Rules and Policy Enforcement

Manages availability, eligibility, composition, configuration, cancellation, warranty and returns.

Standardized Modeling

Defines and manages the product portfolio including products, services and resources.

Centralized Shopping Cart

Ensures consistency across all channels.

Reporting and Analytics

Evaluates quote acceptance rates, loss a analysis and deal profitability.

PLM/EPC 360 Highlights and Benefits



Figure 5. Kloudville PLM/EPC 360 Highlights and Benefits

PLM/EPC 360 Manages CSPs' Product Lifecycle and Business Processes from Ideation to Definition, Launch and Retirement

Highlights



Built for B2B

Leverage the **built-in support** for CPQ and marketplace portals.

Benefit from features such as multi-party orders, multi-location orders, multi-currency, contract pricing, margin analysis, customer specific payment terms, line-item notes and renaming, bulk order import, bulk changes and interrelated order orchestration.

Out-of-the Box EPC and PLM Design

Instantly define products, specifications and pricing for digital and physical goods, services, partner products, sales, rentals, subscriptions, vouchers and more.

Use **integration** to SFA platforms and other CPQ solutions, such as B2C.

Digital First Sales Omnichannel CX

Support any channel by allowing interactions to begin in one channel and end in another.

Obtain 360° visibility into customer profiles, opportunities, quotes, orders, contracts, cases, subscriptions, billing, projects, appointments, interactions and notes.

Benefits



- **Improves productivity** by reducing manual intervention.
- **Reduces support requests** through partner self-onboarding.
- Provides a **one-stop-shop** for support.

- **Enhances NPS score** with 360° customer visibility.
- **Improves customer satisfaction** by delivering exactly what was offered, quoted and ordered.
- **Improves efficiencies** with catalog and online configuration with no-code or downtime.

Source: Kloudville 2023

Kloudville Overview



Kloudville is a privately owned, software company that provides an innovative, composable, cloud and mobile applications suite covering the entire business-to-business and business-to-consumer (B2B2X) concept-to-market, lead-to-quote, quote-to-cash and order-to-delivery cycles for communications service providers (CSPs).

Kloudville is uniquely focused on CSPs' B2B and B2B2X business requirements. It has over 30 years proven business and technical track record of telco systems, a presence on five continents and a global partner network.

Kloudville's product portfolio includes the following:

Marketplace 360

Enables CSPs to build ecosystems by combining their own solutions with partner and industry vertical vendor solutions.

Telecom 360

Automates, optimizes, simplifies and accelerates the entire B2B and wholesale quote-to-cash process.

Product Lifecycle Management/Enterprise Product Catalog 360 (PLM/EPC 360)

Manages CSPs' product lifecycle and business processes from ideation to definition, launch and retirement.

Kloudville is **headquartered** in Toronto, ON, Canada and has offices on five continents.

Partners include ServiceNow, Infosys, Celfocus, Tata Consultancy Services (TCS), Solutions by STC, Readiness IT and Smartdata Solusi Utama.

Kloudville's products are **certified** on ten [TM Forum open APIs](#).

Kloudville Orchestrator is a **Certified ServiceNow App** available on the [ServiceNow Store](#).

Kloudville Overview



Kloudville clients are global telecom providers including the following:



Indosat Ooredoo Hutchison (IOH), Indonesia *Marketplace 360*

Enables IOH and partner solutions for immediate purchase and activation. IOH leverages the Marketplace 360 flexibility to launch any solution via the digital marketplace quickly.

The solution provides product master support, back-office and partner integration, provisioning, activation and inventory/device management.

The marketplace was deployed in under three months and integrated using TM Forum Open APIs. The APIs can support a complete (order to pay) e-commerce journey, partner onboarding, and marketplace management.

Indosat micro, small and medium Enterprises (MSMEs) can access the IOH digital marketplace (MarketSpace) to purchase and activate solutions with guided service “turn-up” (mobile, SMS LBA, I Manage, EPP, and Advisory Hub).

Customers can also use the platform to purchase a complete digital solution suite (Google Workspace (GWS), VOVIX) as an automation tool to run their business.



STC, Saudi Arabia *PLM/EPC 360*

Catalog-driven ordering of all channels. A centralized EPC serves all channels with real-time catalog and chart services, such as e-commerce and mobile app. Publishing of EPC data to non-customer-facing systems.

Rule and policy enforcements: Kloudville provides the rules engine functionality evaluating all business rules related to the products, offers and portfolio.

Management of the end-to-end product lifecycle catalog by integration to Ericsson, MATRIXX Software, 6D and Adobe Experience Manager.



Brightspeed, United States *Telecom 360*

CPQ with CRM and contract management, EPC and product lifecycle management and commercial order management with service order management (SOM) integration.

About Telco Republic

We are the go-to, thought-provoking market research and advisory firm for the new telecom software market.

Our mission is to track ongoing disruption and innovation related to telecommunications business and operations.

As a boutique firm we focus specifically on emerging management systems and applications that allow operationalization and monetization of emerging technologies, operating models and market value creation ecosystems.

- We advise technology vendors on their strategic positioning and messaging. This includes innovation start-ups.
- We advise communications service providers on their strategic purchasing decisions.
- We advise investor clients regarding their strategic investment decisions.

Our Commitment

Within three months, we can help you define a new strategic technology vision and guide you on initial execution of this vision.

We provide rigorous, in-depth benchmarking analysis of the players in this market. Our services center on rigorous, well-vetted market ranking & capability assessments, based on a proven, fact-based rating methodology of respective companies in a given market. In this context, we advise technology vendors on their strategic positioning and messaging, and we advise communications service providers regarding their strategic purchasing decision making.

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