THE INTELLIGENT ENTERPRISE FOR THE TELECOMMUNICATIONS INDUSTRY

Delivering compelling services and differentiating customer experiences

THE BEST RUN **SAP**

WELCOME

Dear Customers,

Refugees arriving at European migrant camps ask for Wi-Fi passwords first, not food or water, according to Kaan Terzioğlu, former Turkcell CEO, who spoke at a recent industry event.[1]

Communication services are not as important to human survival as food and water, but equal access to digital services and intelligent tech-nologies is required for all to fully participate in shaping the future. The telecommunications industry is primed to shape how people interact and how business gets done. By combining the Internet of Things and 5G technologies with machine learning and artificial intelligence, our industry will empower digital inclusion throughout the world and enable the digital transformation of dozens of industries.

To achieve this future, telcos must compete with disrupters and new market entrants by adopting new business models and launching new intelligent digital services. Early success will increase the pace of investment in next-generation networks.

It is the combination of emerging technology and a relentless focus on the customer that will pave the way. Winning telcos will **deliver compelling services and differentiating customer experiences while protecting privacy and ensuring security.** They will engage their customers at every touch point with personalized, end-to-end experiences that can be continuously improved based on their feedback.

Those telcos that best collect, protect, and respond to data from customers, connected devices, partners, and the environment will delight their customers with superb experiences. But to thrive in the experience economy, successful telcos must move beyond basic customer experience. They must listen and respond to feedback on their service and product portfolio, employee satisfaction, and even branding strategy.

I predict that by 2025, telecommunications companies will complete the journey to becoming digital service providers, enabled by the combination of intelligent technologies and next-generation networks. They will put experience management at the center of everything they do and will diversify their revenue streams with an ecosystem approach. **By 2025, revenue from noncommunication services will overtake that of basic communication services.**

Successful telcos will focus on four strategic priorities to achieve this 2025 vision:
- Customer first
- Operational excellence
- Revenue stream diversification
- Intelligent connectivity

To put these strategic priorities into action, telcos must integrate and increase the transparency of their processes and operations end to end and combine this with a real-world awareness about customers and the environment. By shifting routine tasks from humans to business systems enabled by machine learning and artificial intelligence, they will free up the capacity needed to define and pursue innovative and transformative business models.

This paper takes a deep dive into the trends shaping our industry over the next five years and the path to innovation. In it, we propose a set of priorities that will drive transformation and the tools that will make it possible. The world is changing at unprecedented speed, and our industry is positioned to be a driver of progress. The network is the glue that ties together the dramatic business transformation happening across every industry and serves as society's great equalizer, providing access to knowledge, essential services, and one another in even the most remote locations. Together, we can lead the way.

Sincerely yours,

Carl J Kehres

Carl Kehres
Global Vice President
Telecommunications
SAP SE

"Digitalization has reached every aspect of today's life, and it brings new and exciting opportunities for the telecommunications industry. To succeed, telecommunications companies need to strengthen their position as the providers of digital services beyond connectivity while focusing on profitable growth across their key customer segments by embedding intelligence into every step of the value chain."

Carl Kehres
Global Vice President
Telecommunications
SAP SE

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OUR PLACE
IN THE NEW WORLD

Global cross-industry "megathemes" are affecting the telecommunications industry and are providing new opportunities for growth.

Livable cities: Cities all over the world are working with leaders across many industries to create the livable cities of the future. Telco operators are expected to not only provide reliable connectivity
for smarter cities but also take the lead as the orchestrator and platform provider in the enlarged ecosystem.

Global supply chain: Tracking and tracing of goods along the entire supply chain is becoming a common, albeit difficult and costly, practice. Telco operators are in a good position to go beyond the pipe and orchestrate end-to-end solutions by facilitating collaboration among players in the value chain, which includes device and sensor vendors, Internet of Things (IoT) solution providers, and software vendors.

Integrated mobility: Urban areas around the world are struggling with congestion and pollution. Citizens and politicians are looking for solutions that provide convenient, sustainable, and cost-effective mobility. Telco operators in the 5G era will be able to provide
the dedicated intelligent connectivity for integrated mobility combined with an innovative business-to-business-to-x (B2B2X) business model.

Future finance: Practices in finance will rapidly transform along with the next-generation business processes in the digital economy. Telcos, bearing
one of the highest transactional volumes among all industries, face huge costs due to fraudulent behavior. Next-generation processes equipped with innovative technology such as blockchain make it possible for telco operators to streamline their external transactions such as roaming settlement with other telcos.

Circular economy and sustainable energy: We are obliged to conserve the resources of our planet by turning into a circular economy and moving to renewable energy. Telco operators need to make their own contribution. With the IoT and advanced analytics, telcos are well equipped to further optimize their energy consumption while working with battery companies and electric vehicle manufacturers to maximize the reusability of power batteries.

Trusted products: Living in a global economy with complex supply networks, people and enterprises need to trust the products they use. Telco operators are being challenged to commit to the trustworthiness of the billions of devices accessing their networks. They need to collaborate with all parties along the value chain to make sure all devices in their network are genuine and legal.

In addition, the telecommunications industry is being reshaped by these three major trends.

Disruption and competition: Nontraditional market entrants are driving increased margin pressure and speeding up the commoditization of core communication services. To compete effectively in the digital economy, telcos need to focus on delivering a highly personalized customer experience while excelling
in operational efficiency.

Business model innovation: Market saturation will dictate the accelerated diversification of revenue streams, particularly in the digital service space. The need for telcos to quickly meet customer demand, deliver new ser-vices, and make new business models work with an ecosystem-focused approach is greater than ever.

Next-generation network: The evolution of the network creates opportunities for telcos to take
the driver's seat in enabling other industries to reinvent their business processes. The new battleground is all about connecting and monetizing a sensor-based world with the combination of 5G, IoT, edge computing, artificial intelligence (AI), and machine learning (ML) technologies.

Telcos that understand and can adapt to the opportunities emerging from these megathemes and major trends will be among the winners in the next few years.

US$1.2 trillion

Potential cumulative profit for telcos unlocked by digitalization from 2016 to 2025[2]

Digital strategies are disruptive and changing the rules of Telecoms.

Verizon and SAP are teaming up to pursue a strategic go-to-market alliance that pushes the boundaries of industry innovation powered by 5G.

British Telecom selected SAP as its technology partner to lead its digital transformation and deploy a wide range of services across finance, procurement, and workforce management.

Deutsche Telekom built a blockchain-based prototype with IMEI-based filtering to respond more quickly and comprehensively to smartphone theft.

Vodafone used the SAP® Process Mining application by Celonis to achieve 100% process transparency in less than six months, reducing costs by 11% and improving time to market by 20%.

NTT Docomo is collaborating with Komatsu and SAP to provide a connected construction solution combining data from machinery, people, and terrain for real-time decision-making.

Swisscom is transforming its field service into a crowdsourcing model. By partnering with online platform Mila, they offer on-demand crowdsourced support using the power of their customer and small-business partners.

Proximus is leveraging IoT technologies for its network expansion projects, tracing all materials, assessing material consumption, and optimizing material supply.
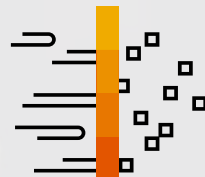
PAVING THE WAY FOR BUSINESS MODEL INNOVATIONS

We believe by 2025, telco operators will complete their journey to becoming digital service providers from two dimensions: first, by putting customers at the center of everything they do to defend current market share and profit margin; and second, by providing digital services beyond connectivity through an ecosystem approach to achieve incremental growth.

Telcos will transform from product centric to customer-experience centric. They'll eliminate the gaps between their back office, customer engagement, and network operations system, streamlining and automating all their operations toward delivering the best personalized customer experience across all channels. They will win by closing the gaps between insights and actions by listening and adapting to the customer point of view while operating on a single intelligent experience platform that can anticipate and deliver on the needs and desires of customers.

Telcos will also transform from a generic sell-to and sell-through model toward an ecosystem-driven approach to win in markets other than connectivity.

In a world more connected than ever, it becomes crucial for telcos to work with new partners and expand offerings with key capabilities such as customer insights, agile monetization, and intelligent connectivity. Successful telcos will become more relevant in the intelligent enterprise journey of specific industries (such as healthcare, automotive, or agriculture) or in essential domains (such as telematics, cybersecurity, or virtualization) by collaborating with the right partners. They will reinvent their business models and processes by delivering context-based intelligent connectivity and digital services, enabled by an ecosystem-friendly platform.

Never before has the pace of technology offered more innovation and transformation opportunities for this industry. Yet, never before have the risks been so high for telcos to be relegated to the back room of the digital economy as a faster and faster "dumb pipe." Embracing the opportunities from new technologies and implementing the right business initiatives will mean staying ahead of the innovation curve, completing the necessary digital transformation, and becoming a digital service provider.

Figure 1: **The Journey to Become a Digital Service Provider[3]**

$1.6 trillion

Projected 5G revenue by 2026[4]

91%

Of telcos believe they need to rethink their business models to continue to grow the business[5]

527%

Improvement in customer profit margin year over year for companies with a best-in-class customer experience[6]

82%

Of telecom consumers would be affected negatively by a poor customer journey and would consider alternatives to a brand[7]
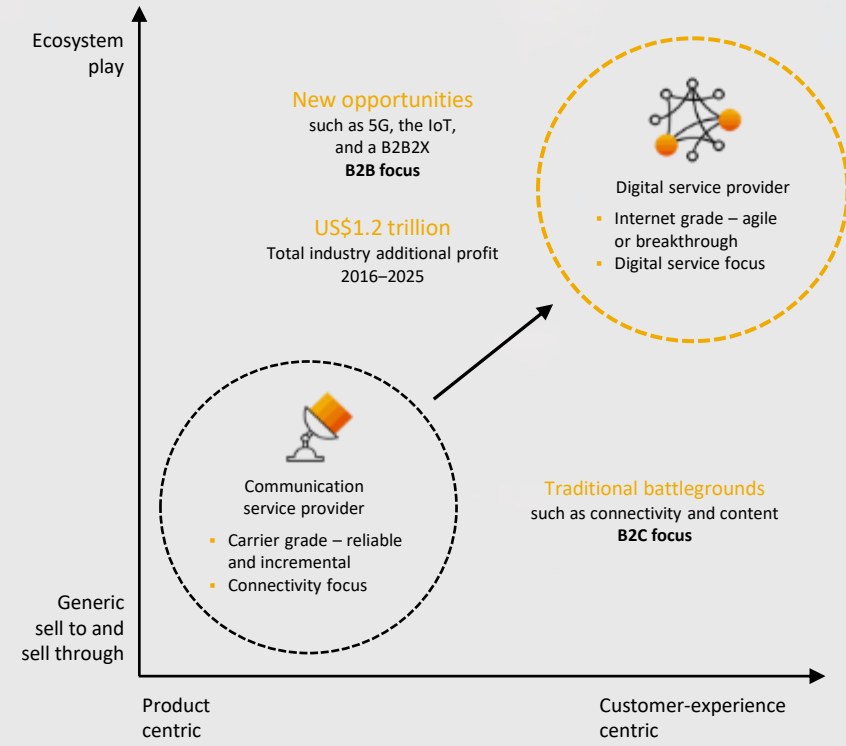
$2 trillion

Value of network investments needed to keep pace with demand over the next decade[8]

25 billion

Worldwide IoT connections (cellular and noncellular) in 2025, more than a threefold increase from now[9]

FOUR PRIORITIES
FOR SUCCESS

We have identified four strategic priorities necessary for telecommunications companies to transform their business.

- Customer first

- Operational excellence

- Revenue stream diversification

- Intelligent connectivity

CUSTOMER FIRST

Consumers in the digital age are asking for more from their telecommunications service providers. Accustomed to the digital experience provided by Internet companies, they expect the same, if not better, services from the telcos. On the other hand, although the business case for 5G is still under discussion, telco operators will certainly face strong competition from over-the-top players in the new era. And with the introduction of new technology such as

e-SIM, the battle for customer acquisition and retention is getting even more brutal. It is critical for telcos to develop and maintain an intimate relationship with the customer to stay ahead in the race.

The Vision

In 2025, telecommunications companies will gain and retain customers by providing proactive digital customer experiences across all touch points and by delivering tailor-made services and solutions to both consumers and enterprises. They will put customer experience and customer value at the center of everything they do, from plan and build to fulfill
and deliver.

The Journey

Telecommunications companies will start toward this goal with automation and fine-grain personalization to maximize customer satisfaction and experience at the right cost with the adoption of chatbot and machine learning technologies. Telcos will further extend their customer value by anticipating and fulfilling customer needs proactively, based on a truly unified 360-degree view of customer experience across all touch points, including network quality of service, digital interaction, and retail outlet interaction with the combination of customer experience insights and business operations data from the connected front office and back office. With a deep understanding of customer consumption patterns, telcos will move on to transform their business by expanding in adjacent industries and markets and adopting new business models.

Three Ireland, working with Qualtrics company (acquired by SAP in January 2019) and Experience Management solutions from SAP, increased its Net Promoter Score by 7% in one year; achieved record-high levels of customer intention to stay; and made customer experience a top-tier metric across the organization.

Today

Reactive with siloed insights

Future

Proactive with 360-degree insights

$30 billion

Potential cumulative profit for telcos by redefining customer engagement from 2016 to 2025[10]

# Reimagine the Customer Experience with an Integrated Front and Back Office

Technology progress and changing government regulations give consumers more flexibility in choosing their communications service provider. It is critical that telcos differentiate themselves by providing the best personalized experience for their most valuable customers – monitoring every interaction of their customers' experiences to spot opportunities for improvement.

In the experience economy, the cycle time to sense, analyze, and respond to the customer experience is a big competitive differentiator. With SAP solutions, telcos intertwine their business systems' operational performance data, or O-data (explains what is happening), with experience data, or X-data (explains why it is happening), which comes "in the moment" from customers. Combining O-data and X-data helps ensure that every business decision is based on both facts and feelings. By connecting the front office and back office, telcos link all their internal processes with the customer experience – for example, optimizing their device supply chain with the goal of delivering the right devices through any channel and at any time customers want.

TRADITIONAL SCENARIO
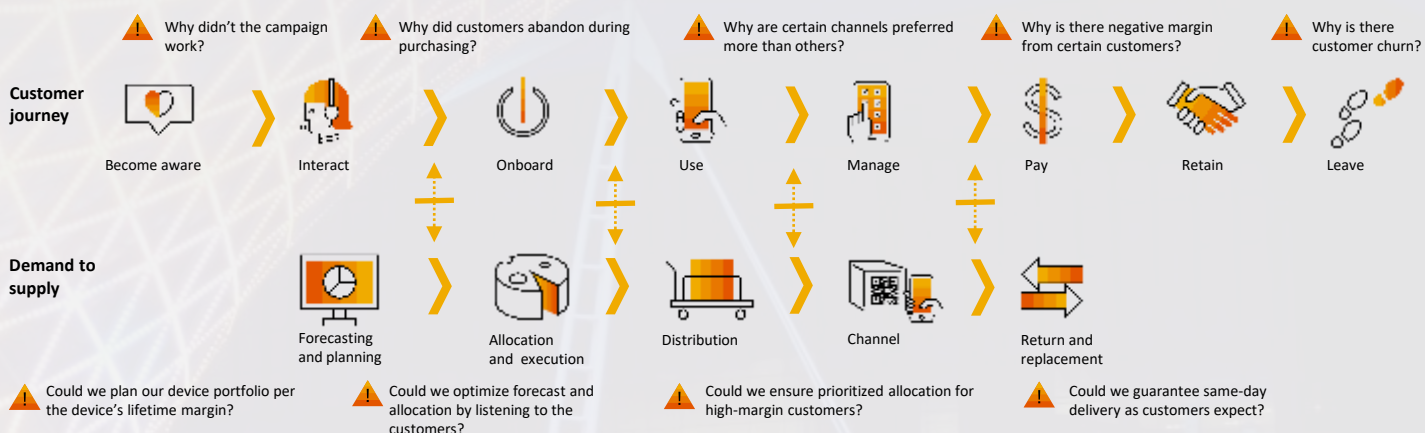
NEW-WORLD SCENARIO
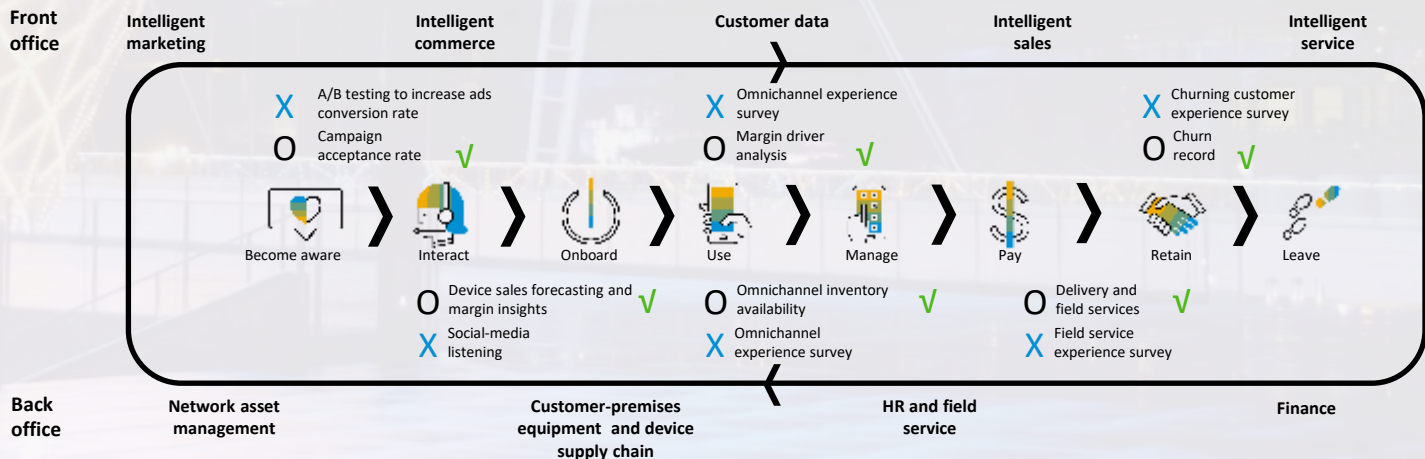
TOP VALUE DRIVERS

7 points
Increase in Net Promoter Score year over year

7%
Reduction in customer chain

Source: SAP Performance Benchmarking

OPERATIONAL EXCELLENCE

The average revenue growth of the telecommunications industry has been slowing down continuously in the past decade. Now, telcos are facing increasing operational expenses and the expected huge capital expenditure from the incoming 5G deployment. As a result, the telco margin is at risk, posing a serious threat to the financial fundamentals of the telco business. To ensure the needed execution capability in the competition for 5G success, telcos must focus fully on optimizing their efficiency and cost by using the latest technologies, from Big Data analytics to blockchain and robotic process automation.

The Vision

In 2025, telecommunications companies will be able to reclaim their leadership in operation efficiency by fully assimilating automation and intelligence into their end-to-end business process, from network operation to customer engagement and from accounting and reporting to talent acquisition and retention, enabling them to compete effectively against new entrants.

The Journey

Telecommunications companies will inject real-time intelligence insights, such as individual margin insights, into decision-making from the strategic level to the tactical level, ensuring the most efficient and future-proof operation model. They will then move on to extend the value by connecting more seamlessly with external parties, including equipment vendors, service contractors, and digital partners. They'll be able to maximize business efficiency in areas such as network maintenance and operation, procurement, and supply chain management, where close collaboration with business partners is a critical factor for success. Telcos will further transform their operation with maximized automation rates across all business processes, effectively blending digital and human labor.

Verizon is streamlining its systems for managing supply chain to speed up the rollout of 5G technologies to customers.

Today
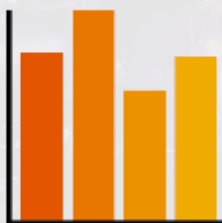
Volume driven

Future

Value driven

$160 billion

Potential cumulative profit for telcos by bridging the innovation gap from 2016 to 2025[11]
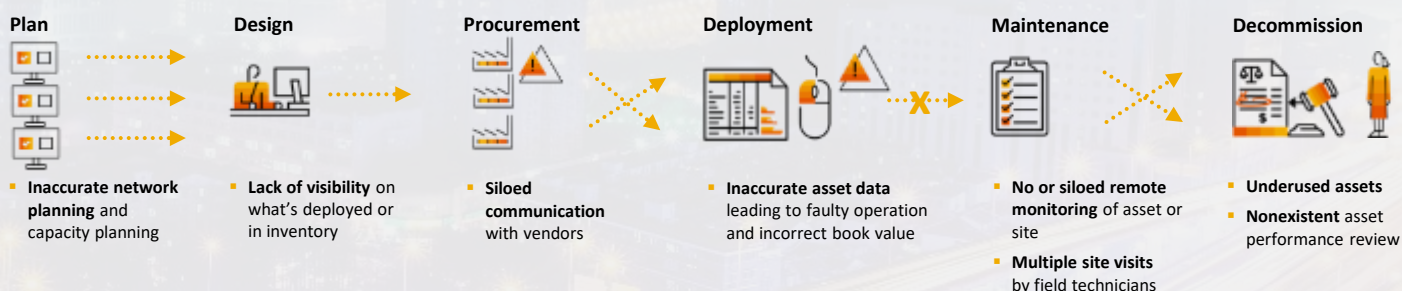
OPERATIONAL EXCELLENCE

Boost Return on Assets with a Collaborative Asset Lifecycle

Telcos are expected to make massive investments in network infrastructures, which creates serious challenges in asset management. Telcos have faced high maintenance costs and low return on investment along the asset lifecycle due to broken processes and inconsistent, inaccurate data; the 5G requirement only adds oil to the fire.
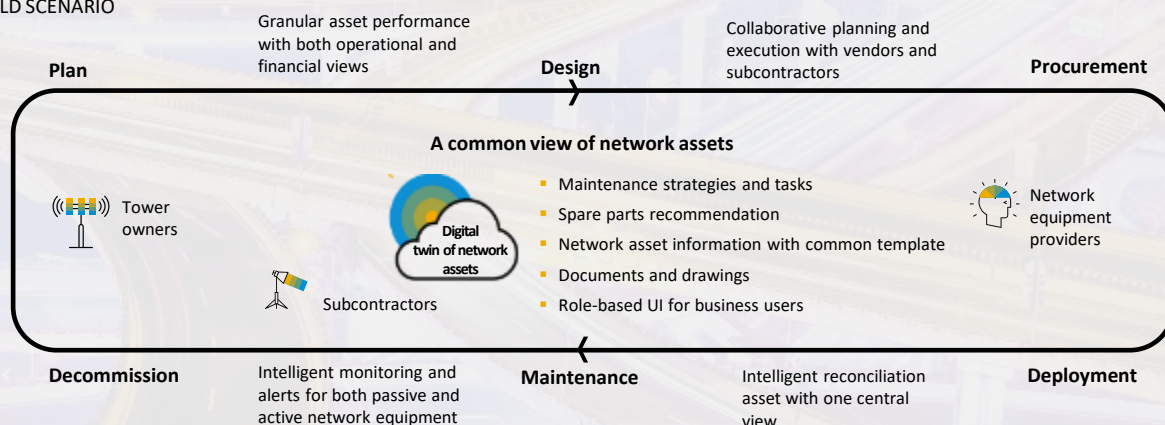
The introduction of digital twin technology to the telecommunications industry clears the path toward the operation model for the next-generation networks that are evolving toward sharing and collaboration. With functionality enabled by SAP software for connected assets, telcos can streamline infrastructure operation through a collaborative working model. They can provide visibility and transparency of contingent workforces, equipment, network sites, spare parts, and cables to equipment providers, maintenance contractors, and tower owners. At the same time, they can assure the consistency and integrity of the asset record by creating a digital representation of the network sites in the cloud with 100% visibility.

By unifying the physical view of network assets with financial and logical views, telcos will be equipped with the insights of granular financial performance data, such as profit per antenna and operational performance – including energy efficiency and equipment utilization per antenna – driving more granular optimization and fine-tuning of investment returns.

TRADITIONAL SCENARIO

Plan
- **Inaccurate network planning** and capacity planning

Design
- **Lack of visibility** on what's deployed or in inventory

Procurement
- **Siloed communication** with vendors

Deployment
- **Inaccurate asset data** leading to faulty operation and incorrect book value

Maintenance
- **No or siloed remote monitoring** of asset or site
- **Multiple site visits** by field technicians

Decommission
- **Underused assets**
- **Nonexistent** asset performance review

NEW-WORLD SCENARIO

Plan   Granular asset performance with both operational and financial views   Design   Collaborative planning and execution with vendors and subcontractors   Procurement

A common view of network assets

- Tower owners
- Subcontractors
- Digital twin of network assets
- Maintenance strategies and tasks
- Spare parts recommendation
- Network asset information with common template
- Documents and drawings
- Role-based UI for business users
- Network equipment providers

Decommission   Intelligent monitoring and alerts for both passive and active network equipment   Maintenance   Intelligent reconciliation asset with one central view   Deployment

TOP VALUE DRIVERS

15%
Reduction in inventory levels for network assets

4%
Reduction in network asset lifecycle cost

REVENUE STREAM
DIVERSIFICATION

The commoditization of basic communication services is not news for telecommunications companies all over the world. Even 5G and next-generation networks won't change the fact that "connectivity only" will just make telecommunications another dumb pipe in the new ecosystem. Telcos can elevate themselves in the value chain only by going beyond the pipe. Although they have been trying to diversify their revenue streams for a long time, they are facing the new possibilities brought by 5G. Telcos must fully embrace an ecosystem approach while establishing the required capabilities to develop and monetize innovative offerings.

The Vision

In 2025, each telecommunications company will find its unique role in the business innovation journey. With the right combination of business models, strengths, and capabilities, telcos will achieve success in revenue stream diversification by transforming into digital life providers, data brokers, digital transformation enablers, and cloud service providers.

The Journey

Telco operators will need to elevate their capabilities in growing new revenue streams by optimizing lead-to-cash processes for innovative digital offerings, targeting both consumers and enterprise and delivering agility and flexibility in time to market and monetization. They will extend their value proposition by expansion through mergers and acquisitions to penetrate new markets or enter new geographies, enabled by a strong digital core to quickly integrate new business units and realize economies of scale. They will transform into an ecosystem-driven model by offering the digital infrastructure to adopt, enable, and retain digital partners and their innovations and opening up telcos' own strengths and capabilities to the ecosystem.

Verizon Connect, the wholly owned subsidiary of Verizon focusing on fleet management and asset tracking solutions, is using the SAP Sales Cloud portfolio to enable its sales force with a faster, more accurate, and consistent quotation process for innovative telco offerings.

Today

Connectivity driven

Future

Digital ecosystem

$650 billion

Potential cumulative profit for telcos by going beyond the pipe from 2016 to 2025[12]

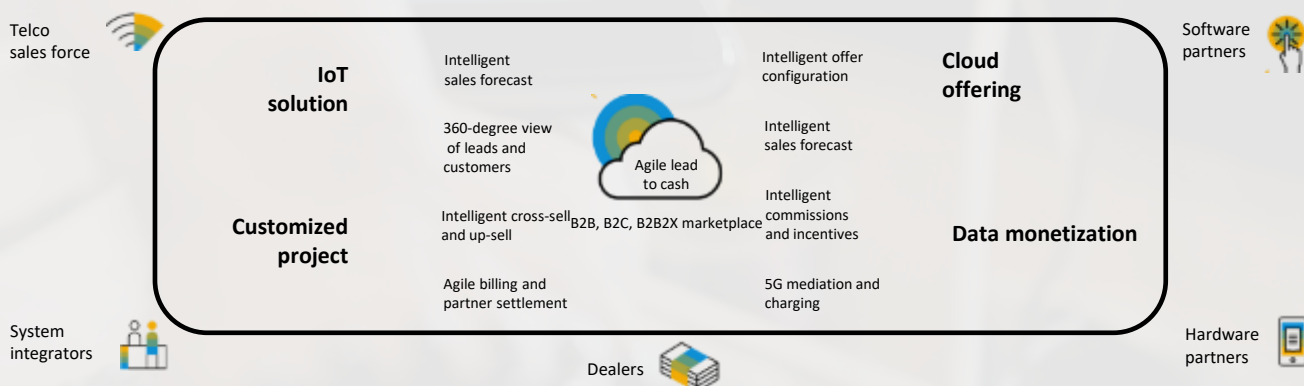# Accelerate Business Innovation with Agile Lead to Cash

As telcos diversify from offering communication services to working with partners to provide digital services and solutions to consumers and enterprise customers, their legacy business support systems can't keep up. The systems, which have been focused on the monetization of communication services, are unable to provide the agility and flexibility required by the new approach. The power of an agile and ecosystem-friendly lead-to-cash platform becomes apparent.

SAP provides integrated, cloud-native applications for intelligent monetization, allowing telcos to transform their end-to-end lead-to-cash process. These applications enable telcos and all participants in their ecosystem to configure, price, and quote complex offerings together intelligently by combining connectivity, infrastructure, solutions, and services. They help ensure that incentive and commission plans are intelligently optimized and accurately executed for both telco-internal and partner and dealer sales forces. They also provide cutting-edge mediation and charging capabilities, which are required to monetize new network capabilities from 5G, such as network slicing; and new business models, such as B2B2X, which telcos would charge and bill on behalf of their enterprise customers in serving end consumers. Last but not least, they enable flexible pricing mechanisms and proper billing and revenue distribution along the ecosystem for complex bundling of new digital offerings.

TRADITIONAL SCENARIO

Demand generation and conversion

- **Low visibility of leads**
- Slow routing and categorization

Sales management

- **Static forecasting**
- Incomplete insights

Contract creation and management

- Connectivity
- Solution
- Service

- **Separated quote and order for connectivity and solution**
- Disconnected dealer and partner system
- Limited up-selling and cross-selling

Mediation and rating

- **Long time to market for new capabilities** such as network slicing

Billing and invoicing

- **Connectivity-focused legacy billing systems**
- Separated and misaligned partner settlement
- Manual reconciliation with general ledger

NEW-WORLD SCENARIO

Telco sales force

Software partners

- **IoT solution**
- Intelligent sales forecast
- 360-degree view of leads and customers
- Intelligent cross-sell and up-sell
- **Customized project**
- B2B, B2C, B2B2X marketplace
- Agile billing and partner settlement

- Intelligent offer configuration
- Intelligent sales forecast
- Intelligent commissions and incentives
- 5G mediation and charging
- **Cloud offering**
- **Data monetization**

Agile lead to cash

System integrators

Dealers

Hardware partners

TOP VALUE DRIVERS

95%
Faster quote-to-order process when quotes are configured by an AI-based configurator

46%
Fewer customer complaints when real-time order, billing, and invoicing are available

Source: SAP Performance Benchmarking

INTELLIGENT CONNECTIVITY

During these early days of 5G deployment, the million-dollar question for telecommunications companies is how to justify the business case and, furthermore, how to maximize the return from investment in 5G. Telcos need to deploy and operate the new 5G networks as efficiently as possible while maximizing the revenue potential from new features available with 5G technology. Innovative business models and revenue streams are possible from the combination of SAP's framework for the Intelligent Enterprise with the telecommunications industry's intelligent connectivity.

The Vision

Working toward 2025, telecommunications companies will continue to spend billions in the evolution and expansion of their infrastructure. The intelligent connectivity provided by telcos, combined with SAP's framework for the Intelligent Enterprise, will be the cornerstone of the journey to becoming intelligent enterprises for most industries and enterprises. The networks will become smarter, more virtual, and approach near-zero latency. Telcos will use new technologies to make these networks even smarter to anticipate congestion, predict failures, and possibly self-heal.

The Journey

Telecommunications companies will need to optimize their infrastructure management to facilitate new ownership and operation models of next-generation networks. They will adopt predictive models to minimize equipment downtime and improve network performance with a single holistic view of real-time, repeatable, and preemptive insights. They will extend the value of intelligent connectivity by enabling edge computing with distributed processing functions. Edge computing will serve as the key bridge between intelligent connectivity and the intelligent enterprise scenarios from relevant industries. Telcos will further transform their business model to use the promising features of next-generation networks such as network slicing, enabling on-demand services and B2B2X models with open marketplace and agile monetization capabilities.

Ericsson used the SAP Enterprise OrientDB database to deliver an integrated solution for its telco customers, connecting multiple complex network topologies for a 20% to 30% improvement in network throughput.

Today

Rigid and generic

Future

Enabling intelligent enterprises

$440 billion

Potential cumulative profit for telcos by enabling the future networks from 2016 to 2025[13]

INTELLIGENT CONNECTIVITY

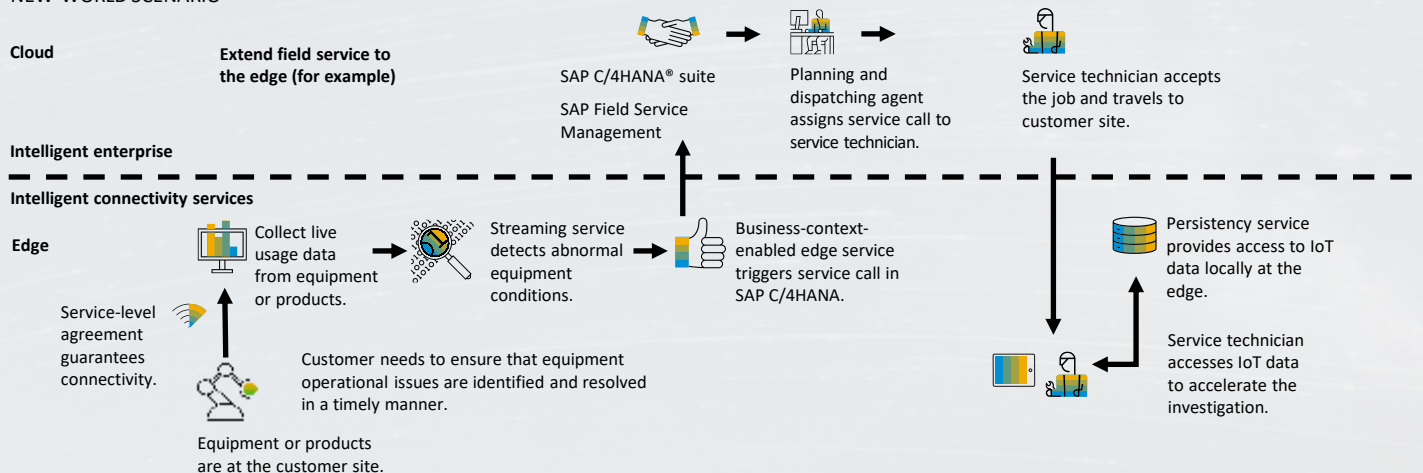# Unleash the Power of 5g with Intelligent Connectivity Services

The potential of 5G when combined with new technologies such as AI, machine learning, and edge computing will be significant. And as we move from a 4G to a 5G world, the size and quantity of data streams will grow exponentially. As a result, there are significant challenges for enterprises regarding data management and data strategy. SAP's data management platforms will be key components of how we enable 5G adoption for our customers across 25 industries. And with the growth of edge computing, telcos are well positioned to deliver data management as a service and platform as a service, so the value chain for SAP's software stack and telco's infrastructure capabilities will be closely tied together.

Intelligent connectivity services enable telcos to bundle SAP's data management platform, including edge services, with next-generation connectivity, providing enterprises the technology foundation to scale from on premise and cloud to the edge of the network for data transmission optimization, latency-sensitive use cases, and deterministic performance of business processes. Enterprise customers can make their assets and employees at the edge operate more efficiently by processing business semantics from mission-critical applications such as SAP S/4HANA® at the edge for real-time action. For example, a 5G network coupled with intelligent connectivity services from SAP can help ensure the level of connectivity, latency, and coverage that is required for scenarios from remote equipment diagnostics to novel retail experiences. And the telcos can wrap a new business model around this and charge it as a service.

TRADITIONAL SCENARIO

Devices and sensors

- Siloed IoT endpoints
- Massive volumes

Legacy connectivity

- Intermittent connectivity
- Latent response

Legacy data processing at the edge

- Lack of business context
- Lack of local intelligence

Disconnected enterprise backend

- Delayed business process

NEW-WORLD SCENARIO

Cloud

Extend field service to the edge (for example)

SAP C/4HANA® suite

SAP Field Service Management

Planning and dispatching agent assigns service call to service technician.

Service technician accepts the job and travels to customer site.

Intelligent enterprise

Intelligent connectivity services

Edge

Service-level agreement guarantees connectivity.

Collect live usage data from equipment or products.

Streaming service detects abnormal equipment conditions.

Business-context-enabled edge service triggers service call in SAP C/4HANA.

Persistency service provides access to IoT data locally at the edge.

Customer needs to ensure that equipment operational issues are identified and resolved in a timely manner.

Equipment or products are at the customer site.

Service technician accesses IoT data to accelerate the investigation.

TOP VALUE DRIVERS

72%

Of 5G growth potential requires operating model transformation[14]

$582 billion

Revenue opportunity for telco operators addressing industry digitalization with 5G technology[15]

KEY
TECHNOLOGIES

Telcos are technology companies, but the ever-increasing pace of change in technology and customer expectations requires the use of new, intelligent technologies. Telcos need the following intelligent technologies to succeed in today's fast-paced world.

Artificial Intelligence and Machine Learning

Machine learning enables algorithms to "learn" from existing data and achieve the best possible outcomes without being explicitly programmed. Once the algorithm is trained, it can then predict future outcomes based on new data. Telcos can use these capabilities to predict and automate network performance optimization and eliminate repetitive manual tasks for customer interaction and back-office processes. They would also be able to revolutionize their capabilities in capturing undiscovered value with a 360-degree understanding of their customers' profiles and behaviors.

The Internet of Things

Advances in ubiquitous and intelligent connectivity near the edge are driving a step change in business productivity. By embedding intelligent capabilities of SAP solutions, such as operating artificial intelligence and machine learning, telcos and their customers can analyze petabytes of data near the source while powering end-to-end processes with insights that affect real business outcomes. Telecommunications companies are revolutionizing their internal processes, from remote condition monitoring and predictive maintenance of network sites to tracking and tracing equipment and spare parts along the supply chain. This positions them as experts who can guide and enable enterprise customers to become intelligent enterprises powered by SAP solutions and intelligent connectivity.

Edge Computing

Edge computing serves as the key bridge between intelligent connectivity and intelligent enterprises. By combining 5G and IoT connectivity with local compute, persistency, predictive analytics, and business transactions at the edge, telcos are extending their value proposition. They are providing industries with IoT applications enriched with enterprise business context to enable faster decision-making, real-time actions, and business outcomes. Distributed cloud computing involves computing power at the edge. SAP solutions enable the intelligent capabilities and connection to business context that can help enterprises turn computing power into insights, action, and improved business outcomes.

Advanced Analytics

The integration of advanced analytics capabilities, including situational awareness, into applications enables business users to analyze data on the fly and drives better decision-making. By combining granular data from all domains across operations support systems, business support systems, ERP, and an experience management platform, telco operators are empowered to inject intelligence into business processes. As a result, they can get real-time visibility into the changing environment, simulate the impact of business decisions, mitigate risk, and achieve better customer outcomes.

Blockchain

A relatively recent breakthrough technology, blockchain is revolu-tionizing the movement and storage of value by creating a chain of unaltered transactional data. The blockchain model of trust, through massively distributed digital consensus, could reshape supply chains and commerce across the entire digital economy, for example, eliminating the transactional cost and fraudulent activities inside interoperator transactions such as roaming.

Conversational AI

Advances in machine learning are enabling algorithms to become highly accurate in natural-language understanding and in image and speech recognition, which is especially useful in handling customer inquiries through digital channels and assisting business users. Voice interface will be the go-to technology for the next generation of applications, allowing for greater simplicity, mobility, and efficiency while increasing worker productivity and reducing the need for training.

Robotic Process Automation

Robotic process automation streamlines repetitive, rule-based processes and tasks in an enterprise and reduces costs through the use of software robots, replicating specific tasks or keystrokes.

Data Platform to Manage Experience

Leaders are intertwining the operational performance data from companies' business systems (what is happening) with the experience data coming from customers and employees (why it is happening).

93%

Of leaders say that technology is critically important or very important to retaining competitive advantage, versus 72% for all others[16]

60%

Of human tasks will be automated by 2025[17]

99%

Accuracy in voice and video recognition by 2020[18]

80%

Of telecom consumers would have an improved customer buying journey if real-time assistance were available[19]

$19 billion

To be saved annually if blockchain-based security were to lead to a halving of fraud in the telecommunications industry[20]

$27 billion

Cost savings for the telecommunications industry over the coming decade with autonomous networks[21]

40%

Of digital transformation initiatives will use AI services by 2019[22]

GETTING THERE:
A PHASED APPROACH

Companies will become intelligent enterprises on three distinct tracks as they evolve their strategic priorities to match their company's vision. Telecommunications companies will:

- **Optimize** what they already do by implementing a stable and scalable digital core to make processes more transparent and integrated

- **Extend** their current processes by connecting them to the real world using IoT technologies

- **Transform** their business using a constant stream of data enabling new service-driven business models. (See Figure 2.)

Figure 2: Strategic Priorities Across the Telco Value Chain
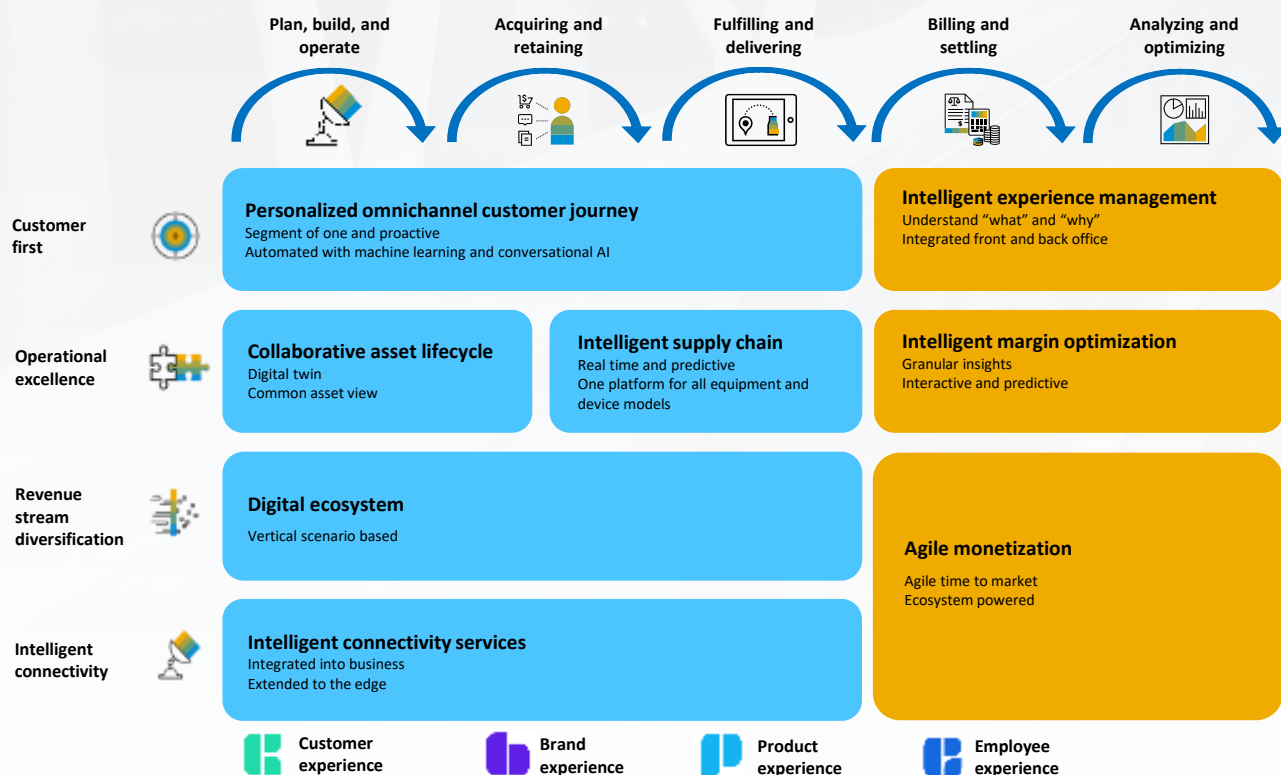
SAP'S FRAMEWORK FOR THE INTELLIGENT ENTERPRISE

Most organizations understand what is happening in their business but may not always know why.

They know what's happening because they have systems that capture operational data – about their customer transactions, supply chain, manufacturing, spending, and the activities of their workforce. They can see that data through reports and dashboards. They can see trends and predict what will happen next.

But to influence what happens next, companies need data about the interactions that people have with their products and their business. Experience data captures beliefs, emotions, opinions, and perceptions – the "why" something is happening. And when companies know why something is happening, they can make an informed decision about the best way to respond.

To win in this experience economy, intelligent enterprises connect experiences with operations. They use both X-data and O-data to guide their business decisions. Intelligent enterprises collect insights from customers, employees, products, and brands at every touch point. They use powerful technologies to automate and integrate their data, processes, and applications, enabling them to sense risks, trends, and opportunities. And they act on this intelligence across every part of their business. (See Figure 3.)

SAP has the strategy, expertise, and solutions to deliver on this vision, enabling intelligent enterprises to turn insight into action.

Figure 3: SAP® Intelligent Enterprise Framework
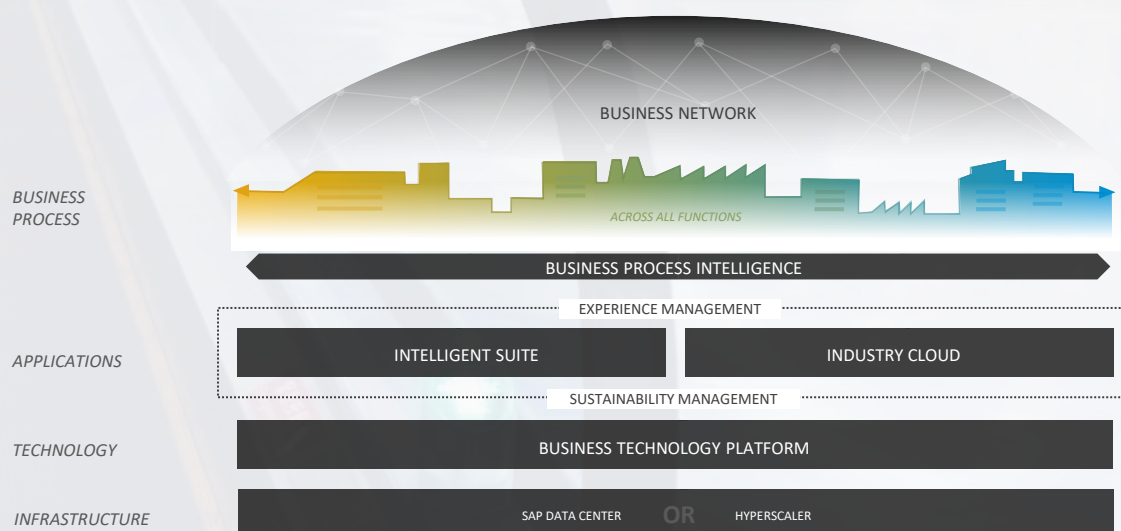
HOW TO PLAN YOUR PATH TO THE INTELLIGENT ENTERPRISE

In the digital economy, intelligent technologies and integrated business processes are now driving digital transformation.

To do this effectively requires a comprehensive plan for becoming an intelligent enterprise. (See Figure 4.) This includes creating an intelligent enterprise road map and implementation plan with proven best practices and deployment options that optimize for continuous innovation with a focus on intelligent outcomes.

Figure 4: The End-to-End Journey to Becoming an Intelligent Enterprise

Plan
well to manage expectations

Simplify and innovate
- Reimagined business models, business processes, and work
- SAP® Intelligent Enterprise Framework as a guide for digital transformation
- Value-based innovation road maps

Build and launch
with proven best practices

Standardize and innovate
- Model-company approach to accelerate adoption with model industry solutions
- Design thinking and rapid, tangible prototypes
- Coengineered industry innovations delivered with agility

Run
all deployment models

Run with one global support
- One global, consistent experience
- End-to-end support – on premise, in the cloud, or with a hybrid approach

Optimize
for continuous innovation

Optimize to realize value
- Continuously captured and realized benefits of digital transformation

To move forward with speed and agility, it helps to focus on live digital data and combine solution know-how and industry-specific process expertise with data analytics so that the right digital reference architecture is defined and delivered. In that context, a model-company approach is aimed at simplifying and increasing the speed of the digital transformation journey. Model companies represent the ideal form of standardization for a specific line of business or industry. They are built on preconfigured SAP solutions based on best practices supported by SAP, along with the business content that encompasses our experience and expertise relevant for the industry. They provide a comprehensive baseline and come with the accelerators to jump-start digital transformation projects.

RISE WITH SAP: BUSINESS TRANSFORMATION AS A SERVICE

In today's world, the companies that thrive are those that adapt quickly. Optimizing and transforming the business is a customer journey triggered by today's challenges and tomorrow's opportunities in every industry.

RISE with SAP is a combination of modular services and solutions to enable the business and technology transformation journey of our customers, picking them up where they are today and taking them where they want to go – at their own pace.

RISE with SAP has three foundational elements:

Business Process Redesign	Technical Migration	Build Your Intelligent Enterprise
BUSINESS PROCESS INTELLIGENCE	**TOOLS & SERVICES**	**NETWORK** **APPLICATIONS** **PLATFORM** **INFRASTRUCTURE**
Business process intelligence benchmarks your process performance against your industry peers and recommends the areas where business redesign will yield the best results.	Tools and services from SAP and our partners support the transformation journey.	SAP S/4HANA Cloud helps you keep your business agile and responsive. The business network connects you to customers, partners, and suppliers. SAP Business Technology Platform and industry cloud solutions offer next practices and technologies for your business. Your choice of infrastructure as a service (IaaS) is the foundation for your business in the cloud.

RISE with SAP enables organizations to avoid high up-front investment costs and focus on reduced TCO* and fast time to value, with the flexibility they need. With RISE with SAP, it's simple: there is one hand to shake, one offering to customize, and one partner to manage operations, issue handling, and service-level agreements.

We look forward to joining our customers on their transformation journey into the future. Find more about RISE with SAP at www.sap.com/RISE.

*RISE with SAP allows customers to realize the value of their investment sooner, with up to a 20% reduction in TCO over five years for SAP S/4HANA Cloud, private edition, as compared to a traditional ERP deployment.

Source: TCO reductions and timelines are modeled estimates from interviewed company data taken from the following IDC studies: SAP ECC and SAP S/4HANA TCO Study (Nov. 2020) and IDC SAP S/4HANA Business Value Study (March 2020). Timelines and estimates are intended for illustrative purposes only, and SAP makes no guarantees as to actual results.

COMPREHENSIVE
SAP ECOSYSTEM ORCHESTRATING
THE PARTNER ECOSYSTEM TO
DELIVER VALUE FASTER

Our comprehensive ecosystem for the telecommunications industry offers:

- The Intelligent Enterprise as the overarching strategy to meet future requirements, providing:

  – SAP S/4HANA co-development programs for customers and partners

  – Industry co-innovation programs for industry-specific use cases

  – Delivery of enterprise-to-enterprise industry clouds

  – Thought leadership, evangelism, and enablement by industry through events, councils, and regular customer exchange

- Integration into a wide range of business services (OEMs, suppliers, key vendors, and more)

- Open architecture, with a choice of hardware and software specifically designed to meet requirements

- Complementary and innovative third-party solutions to provide leading-edge and state-of-the-art technology

Our partner ecosystem includes, among others:

DigitalRoute

celonis   accenture   RIZING

IBM   EY   Deloitte.   NEORIS

SAP IS COMMITTED
TO INNOVATION

10-Year Innovation Vision

SAP delivers fully intelligent business solutions and networks that span across company boundaries and promote purpose-driven businesses. These solutions will be the most empathic symbiosis between machine intelligence and human ingenuity.

Comprehensive Industry Coverage

SAP enables comprehensive coverage of the complete telecommunications value chain across the enterprise. With its clear industry road map, SAP is the partner of choice for the telecommuni-cations industry.

Proven Services Offering

By bringing together world-class innovators, industry and emerging technology expertise, proven use cases, and design thinking methods, we help telcos develop innovations that deliver impact at scale.

- Self-running enterprise systems
- Self-organizing business ecosystems
- New markets and business models

- 10 of the top 10 global telcos run SAP software
- 94% of telcos in the Forbes Global 2000 are SAP customers
- More than 4,500 telco customers worldwide
- 1.8 billion mobile messages are processed every day by SAP

- Proven methodologies to drive innovation, from reimagining customer experiences to enhancing operations
- Innovation that is fueled through a managed innovation ecosystem from SAP
- Ability to build your own innovation capability and culture

SAP supports telecommunications companies in becoming intelligent enterprises – providing integrated business applications that use intelligent technologies and can be extended on SAP Cloud Platform to deliver breakthrough business value.

Learn more

- SAP for Telecommunications
- SAP Services and Support

RESOURCES

Outlined below is external research that was used as supporting material for this paper.

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3. Figure created by author using data from "5G Monetization: Operational Imperatives," TM Forum, July 2018, and from "Digital Transformation Initiative: Telecommunications Industry," World Economic Forum in collaboration with Accenture, January 2017.

4. "5G for Business: A 2030 Market Compass Report," Ericsson, 2019.

5. Survey conducted by SAP at Mobile World Congress, 2018.

6. Calculation by SAP Center for Business Insight 2017, based on "CEM Executives' Agenda 2016: Aligning Business Around the Customer," Aberdeen Group.

7. U.S. Telecom Report 2018, Whisbi, 2018.

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Note: All sources cited as "SAP" or "SAP Performance Benchmarking" are based on our research with customers through our benchmarking program and other direct interactions with customers.

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