From Telcos to Digital Service Providers
Enabling Digital Life
in a hyperconnected world
Dear Reader,

We live in a hyperconnected society. The telecommunications industry has made this possible. Thanks to massive investments in mobile and fixed broadband and in wireless network infrastructure from telco operators, our planet is now a true “global village.” The proliferation of connectivity, Internet access, smart devices, and SIM cards has created a new digital life and digital economy.

Today there are over seven billion mobile cellular subscriptions, and more than 95% of the world’s population is covered by a mobile cellular network. This hyperconnectivity has changed everything, from the way we communicate to the way we work, shop, pay, and play. In Q2 2015, the daily time spent inside mobile applications by the average U.S. consumer exceeded that of TV viewing time. More than USD $14 billion was spent in 24 hours during Alibaba’s e-commerce “singles’ day, with mobile phones accounting for 69% of the transactions.

Paradoxically, telco operators risk becoming front-line casualties of the digital revolution they have helped create. They are disrupted by aggressive new over-the-top (OTT) players such as Apple or Google, which deliver services on the operators’ network infrastructure and siphon core revenue away. Operators are restricted by regulations that bind them to domestic rules in an increasingly global world. Their core services are completely commoditized, putting pressure on their margins. They are engaged in an endless race of network upgrades, causing capital expenditures to skyrocket and making return on assets unpredictable.

In this context, industry players must act quickly to stay relevant and thrive in the new digital economy. They must invest now in order to build their own futures. They need to:

- **Reimagine their own business processes** for a real-time world and improve operations, agility, and resilience
- **Reimagine work** for the next-generation workforce of digitally savvy, mobile-first employees
- **Reimagine business models** and start to build out the technology infrastructure that will support the new digital economy

The need for reimagining business models has never been so great for the industry. Fortunately, operators have unique advantages that can give them the ability to become leaders in the digital economy, if they can be bold and imaginative. Carriers are becoming “digital service providers,” finding opportunity in a variety of business models such as:

- Digital lifestyle providers
- Digital transformation enablers
- Data brokers
- Business cloud service providers

In this document, we will share with you our insights about where the communications industry will go and how SAP is working with leading companies to drive the digital transformation. Thank you for your interest, and I look forward to our journey together.

Stephan Gatien
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Telecommunications Business Solutions
SAP SE
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EXECUTIVE SUMMARY

Big picture: The digital economy is real and it’s changing everything

The Digital Economy

Five technology trends have converged into the digital economy – hyperconnectivity, supercomputing, cloud computing, a smarter world based on outcomes, and cybersecurity. The resulting pace of change is staggering. In the next 10 years, 40% of the S&P 500 will no longer exist if they do not keep up with these technology trends.

Digital technology removes barriers to entry

With voice over IP technology (VoIP), new players like Skype or WhatsApp can offer customers the same services as traditional telco operators, without investing in infrastructure while playing over-the-top. According to Ovum, telco operators will lose out on USD $386 billion between 2012 and 2018 because of over-the-top VoIP.

Customers expect more

Customers expect a new type of experience: one that is frictionless, where commerce is seamless, where technology is invisible, and one that makes their lives easier, regardless of the channel they use.

Early adopters are winning

Research shows, companies that have embraced the digital world and execute on their digital strategy are seeing real shareholder and stakeholder value. Key digital players like Google and Facebook have demonstrated agility and innovation with consumers. An early mover NTT DOCOMO already drives more than 15% of its average revenue per user through its Smart Life Suite. Can telco operators emulate this behavior to take the lead with enterprises and Internet of Things services?

WHAT DOES THIS TELL US?

The road map to relevance is to reimagine business models and proactively evolve as core services get fully commoditized and over-the-top players continue to disrupt.

Every business is now a technology business

Digital business models are disruptive.
The rules have changed.

- WhatsApp has more than 900 million active users in the world, sending in excess of 30 billion messages a day at no cost, bypassing the network operators and eroding revenue.
- Google is aggressively expanding its Google Fiber service to create a super high-speed broadband Internet in the United States, enabling an always connected lifestyle at full speed.
- WeChat, a Chinese messaging service with 600 million subscribers, has become a digital platform and is leveraged by the city of Beijing to provide free traffic and road condition updates in real time.
- T-Mobile U.S. rewrites all the rules to operate in a saturated U.S. wireless market by being bold and simplifying everything (frequent device upgrades, no contracts).
- Netflix is completely transforming the way content is consumed, disrupting both the traditional cable provider model and the new IPTV services from network operators.
EXECUTIVE SUMMARY
The path forward: Seizing the opportunity

Transformation drivers

The Big Bang of Big Data
As smartphones, sensors, and other mobile devices become ubiquitous, the data produced globally is expected to double every two years.\textsuperscript{15} Because of that, communication service providers (CSPs) will need to find opportunities to personalize and monetize services or create new data-driven businesses. We are at the beginning of the data economy.

Everything is connected
With an estimated 50 billion devices expected to be connected by 2020,\textsuperscript{16} the possibilities to create new vertical businesses and offer value-added services will be endless. With sensors everywhere, telco operators have a huge opportunity to help other industries transform in the Internet of Things era.

Mobile broadband first
Mobile data traffic will grow almost 8x by 2019,\textsuperscript{17} fuelled largely by video traffic. This will shape customer expectations for content and service consumption.

Network virtualization
As software permeates the core network domain of operators, network function virtualizations and software-defined networking offer bold promises of faster time to market, new revenue streams, and a new industry ecosystem.

Reimagining the future

Digital lifestyle providers
With well-established customer bases, telcos can position themselves at the heart of new digital services such as home security, e-healthcare, entertainment, financial services, and more. Such a path can help them find ways to coexist with OTT providers rather than competing with them.

Digital transformation catalysts
We also see carriers becoming digital transformation catalysts to help business customers in other industries adapt to a sensor-based world and the Internet of Things.

Data brokers
Positioned strategically at the heart of most digital traffic, thanks to their networks, CSPs have a unique opportunity to become central actors in the emerging data economy and create new data-centric business models.

Business cloud service providers
CSPs have the right DNA and assets to establish themselves as cloud service providers for businesses, from SMEs to large enterprises. They understand data centers, five nines’ uptime and scale, and they can become the trusted partners of their B2B customers for consumption of cloud-ready business solutions.

FROM: SIMPLE COMMUNICATION SERVICES TO: ENABLER OF THE DIGITAL LIFE

Cloud service providers
Digital home automation
Mobile money
Data brokers
IoT services
... and more

5.9 billion
Estimated number of smartphones in the world by 2020\textsuperscript{18}

1 millisecond
The expected latency of the fifth generation wireless network (5G): unperceivable to a human and 100 times faster than the current 4G \textsuperscript{19}

50%
of YouTube’s global traffic comes from mobile devices\textsuperscript{20}
TOP FIVE TELCO TECHNOLOGY TRENDS

Top five technology trends that are enabling the digital economy and changing the telco business landscape
EXECUTIVE SUMMARY
Perfect storm: Five technology trends changing everything in telco

We are witnessing an unmatched era of true business innovation. Breakthrough technologies have matured and hit scale together, enabling five defining trends:

1. HYPERCONNECTIVITY
   The mass adoption of smartphones and increasing connectedness of “things” are mutually reinforcing trends. The more connectivity we have, the more benefits we see, driving demand for instant, real-time, mobile access to information and transactions. Telcos built the infrastructure that created the digital economy and now must quickly upgrade and scale networks to keep pace with rabid consumer and business demand for more connections, larger allocations of data, and faster download/upload speeds.

2. SUPER COMPUTING
   Computing power available per dollar has increased by a factor of 10 roughly every four years in the last quarter century. Limits of 20th century computing power are gone. Restrictions on the CSPs’ ability to process petabytes of network, location, billing, mobile payment, and social data are fading, giving way to the unprecedented ability to segment, target, and retain the most profitable customers.

3. CLOUD COMPUTING
   With mobile cloud traffic growing 11x from 2014 to 2019 (annual CAGR of 60%), increasing consumption of cloud solutions presents a massive opportunity for CSPs. Beyond connection revenues, CSPs can leverage their unique infrastructure position to develop and host cloud applications. Cloud solutions will also allow CSPs to “onshore” non-core business processes to cloud providers and focus on providing their subscribers with the best experience on the best available network.

4. SMARTER WORLD
   The new, smarter world of the 21st century will redefine how CSPs go to market and how they conduct internal operations – at a disruptive pace. Big Data and open-sourced technology will allow CSPs to manage, analyze, and eventually monetize the vast quantities of data that pass through their networks. Internally, robots, drones, augmented reality, and the Internet of Things will allow CSPs to fundamentally reimagine how they handle customer interactions, monitor expansive networks, and optimize field technician tasks and routes.

5. CYBER SECURITY
   Cyber criminals have new capabilities to attack, undermine, and derail businesses. During 2014, Experian estimated almost half of all companies experienced a data breach, and the cost of each breach is rising 11%, reaching an average cost of USD $6.5 million per incident in the United States in 2015. CSPs are no different – their networks are prone to hacking and the CSP must continue to be at the forefront of security technology to stave off public and criminal culpability.
The digital economy is being created by – and driving adoption of – mobile, connected devices for business and personal use. CSPs provide the infrastructure that supports hyperconnectivity. As network traffic and subscriber numbers grow, carriers must provide reliable and secure access in order to maintain quality of service and attract new customers. In addition, they must support new business models and use cases with value-added services.

The proliferation of mobile devices and connectivity creates a positive feedback cycle; the more successful CSPs are at enabling business growth on their networks, the more devices will be driven to connect to the network. As more people, businesses, communities, and sensors become connected, CSPs will find greater opportunity for new business models and revenue streams.

1. **People**
   Today, over 3.4 billion people are connected to the Internet, and this figure is growing at a global average of 9% per year. As mature markets reach saturation and growth roars on in developing nations, CSPs stand to benefit from increasing penetration of Internet services as well as fueling digital business models that arise from the connection of disparate user groups.

2. **Business**
   The increasing digitization of business has enabled the CSP to connect groups of suppliers, partners, and vendors across vast geographies like never before. Businesses are finding new value in the creation of B2B networks and deriving new levels of efficiencies and savings. CSPs are uniquely positioned to offer premium services to create differentiated offerings for their business users.

3. **Communities**
   Millions of people are leveraging specialized communities to provide services, share knowledge, and engage in commerce. Businesses need to leverage these communities to enhance customer engagement and maximize value potential. Being at the center of our hyperconnected world, CSPs can be the facilitator of virtual collaboration between different industries.

4. **Sensors**
   Today, sensors are more reliable, last longer, and cost a lot less; the connection of these sensors to networked computers and other devices over the Internet (Internet of Things) has quickly become a business reality. CSPs must create specialized offerings to support the unique value proposition of these connected devices and their associated use cases. Top industry performers will augment their IoT offering with application development and support services to further engrain themselves as a key IoT partner.

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CSPs own the networks that drive the hyperconnectivity of people and things; top performers will capitalize on network growth while also expanding their role into new value chains.
CSPs will gain unprecedented insight into their complex customer data using large-scale in-memory computing.

Since the inception of business applications, CSPs have dealt with major limitations. Transaction and analytic systems required separate landscapes, resulting in complexities (data redundancy, batch jobs, complex systems, high costs). While CSPs have long owned a high volume of extremely valuable, personal data, acting on this information has proven difficult. Disparate legacy systems impede the CSP’s ability to aggregate data and draw insight.

SAP’s innovative in-memory solution, SAP HANA, is a completely new platform that eliminates the need to keep transactions and analytics on separate systems. It represents a massive breakthrough for CSPs and their ability to analyze customer, market, and network data.

The value that this technology brings includes:

1. **Real-time business**
   Supply chain, finance, and other processes can focus on predicting and optimizing the future and can run in minutes, not hours or days, changing how people work and how the CSP’s business is optimized.

2. **Business agility**
   Changes, such as launching new pricing plans, introducing new hardware subsidization and financing models, introducing new business models, or reacting to regulatory requirements (e.g., IFRS) can be made in a fraction of the time.

3. **Reduce total cost of ownership**
   TCO has decreased dramatically due to the collapse of architecture, fewer customizations, the ability to run large volumes of data on a single computer, and cloud deployment options. Architecture simplification will also enable fewer points of failure. CSPs can shift their IT spend to innovation and value creation.

SAP HANA is a platform to manage digital business. Although the technology is relatively new, more than 6,400 companies are leveraging it to reimagine their business.
Most companies operate in a hybrid world where cloud technologies interact with on-premise applications. Most innovations are delivered in the cloud, and the value is proven. With faster time to value, network-enhanced capabilities, and rising adoption, cloud is the clear choice for innovators.

We believe that there are four cloud delivery models which must be evaluated:

1. **Software-as-a-service (SaaS)**
   SaaS is a mature offering, and SAP is the clear leader in the cloud, with over 95 million users.\(^{32}\) SAP has partnered with numerous CSPs in joint go-to-market initiatives and is a complementary partner for network provisioners.

2. **Platform-as-a-service (PaaS)**
   PaaS provides an entire computing platform in the cloud, including hardware, software, and open APIs to build new businesses and create new solutions. The SAP HANA Cloud Platform is a disruptive platform for this business.

3. **Infrastructure-as-a-service (IaaS)**
   Businesses are leveraging IaaS to get up and running in a matter of hours, without spending significant capital expense.

4. **Business networks**
   Companies are connecting and sharing information and transactions in the cloud. This collaboration will change how commerce is transacted. Ariba is leading this collaborative effort with nearly two million companies connected and $740 billion in commerce.\(^{32}\) We believe there will be trillions of dollars of business commerce, creating efficiencies in the way business is conducted.

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**Global SaaS software revenues** are forecasted to reach $106 billion in 2016, increasing 21% over projected 2015 spending levels.\(^{33}\)

**Projected spending on cloud computing infrastructure and platforms** will grow at a 30% CAGR from 2013 through 2018, compared with 5% growth for overall enterprise IT.\(^{34}\)

**$740 billion+** in business commerce through the Ariba Network.\(^{32}\)

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The world is becoming smarter with the digital economy, and this is influencing companies in dramatic ways. Companies can leverage Big Data and new technologies to change everything from product design to how customers are served. Industry lines are blurred, and companies need to innovate, or they will lose market share.

In order to compete, every company must be a technology company. Companies are creating new business models, embedding software in products, and focusing on business outcomes.

There are three innovations enabling the world to become smarter:

1. **Smarter robots**
   Robotics has redefined manufacturing. Robots have become more humanized with soft skills, can take on tasks without human intervention, and are available at increasingly lower costs. Robotics offers interesting applications for the CSP’s infrastructure maintenance and eventually, once the technology matures, for customer-facing use cases.

2. **Artificial intelligence**
   The explosive growth of structured and unstructured data can be analyzed via AI. Computers can answer questions faster than humans through machine-based algorithms. Software can self-learn. CSPs have inherent technologies that can be leveraged to use the power of AI internally and also to create new go-to-market data-related opportunities.

3. **Smart products**
   Smart products will change how businesses and consumers interact, and ultimately change the world. Network maintenance field operations have the potential to be revolutionized by autonomous vehicles and drones. Specifically, the CSPs’ infrastructure will form the networks that drive the efficiency, safety, and reliability of autonomous vehicles.

The economic implications of 3D printing are significant, with up to $550 billion a year by 2025\(^{37}\)

The fastest growing segments through 2020 include **home energy conservation**, with a CAGR of 49.4%, and **IoT in utility monitoring**, with a CAGR of 59.8%\(^{36}\)

The global industrial robot population will double to about **four million by 2020**\(^{35}\)

A smarter world will reshape the way CSPs approach markets and operations.
CSPs occupy the unenviable position of being a prime, data-rich target of hacking and also potentially an unwitting facilitator of hackers.

CSPs are guardians of a confluence of sensitive data, which makes them an ideal target of hackers. We live in a data-driven economy; all businesses collect some form of data. However, the CSP is different because of its ownership of network data. For most, mobile phones represent the single-most-used portal of communication, which creates the risk that our personal and professional conversations could be intercepted while traversing the CSP’s network. Additionally, advancements in mobile phone technologies have placed myriad sensors, GPS locators, microphones, and even biometric monitors within the device that we carry with us at all times, representing an additional dimension of risk exposure for CSPs to control.

Managing security across your digital business must be accomplished through proper governance. This reduces TCO, business risk and compliance breaches and solidifies the trust of your customers.

The following three cyber security elements should be addressed:

1. **Securing data**
   Securing data requires companies and their partners to stay compliant with data privacy and regulations, understand local data controls, and establish encryption and classification criteria.

2. **Securing interactions and identities**
   Value chain interactions must be secured. Joint SLAs should be in place with partners, checks should be at the application level to prevent widespread impact, and connectivity should be safeguarded. There should be central authentication, regardless of device, and devices must be maintained to prevent hackers from gaining access to your digital IP.

3. **Partnering with trusted suppliers**
   Supplier relationships are key in establishing trust as more non-core processes are outsourced. Companies should build relationships with a few partners who meet the highest security standards. This will also result in a more simple and nimble architecture.

In 2014, **47%** of adults in the United States had their personal information exposed by hackers.

Five out of six large companies were targeted by cybercriminals in 2014, a **40% rise over the previous year**.

Globally, cyber crime costs businesses **$375-$575 billion** annually and a net loss of up to 200,000 jobs in the United States alone.
REIMAGINING

THE DIGITAL ECONOMY OFFERS INFINITE NEW OPPORTUNITIES

In a connected world, where every company is becoming a technology company, smarter products and services will refocus commerce on business outcomes and blur industry lines.
**DIGITAL INNOVATION IS REAL**

The Digital Economy is enabled by network connectivity, which means that CSPs are in a position to lead this new digital revolution. Hyperconnectivity is not enough to create value. The big data generated by the networks and customers needs to be converted into contextual information in real time. CSPs need to transform and re-imagine their business to monetize the digital opportunity.

### REIMAGINE BUSINESS MODELS

Examples of reimagined business models help to illustrate the scope of the transformation.

- **Digital lifestyle provider:** As the digital revolution permeates all aspects of our lives, operators need to differentiate by providing new services. Offerings like mobile wallet, media sharing, tele-health, and home security are gaining popularity with consumers and provide CSPs with new revenue.

- **Digital transformation catalyst:** Because of their role in the digital economy, CSPs can help other industries adapt to the emergence of a sensor-based world and the Internet of Things.

- **Data broker:** Positioned strategically at the heart of most digital traffic thanks to their networks, CSPs have a unique opportunity to become central actors in the emerging data economy.

- **Business cloud service provider:** CSPs have the right DNA and assets to establish themselves as cloud service providers for businesses from SMEs to large enterprises.

### REIMAGINE BUSINESS PROCESSES

Reimagined business processes provide return on investment while creating a foundation for the future.

- **Personalize customer engagement** by leveraging Big Data. Anticipate customer behavior and gain a holistic understanding of the market to tailor the right plans to the right audience at the right time.

- **Quickly create and monetize new services** by establishing a modern foundation for rating, charging, and billing, suited for the real-time demand, partner orientation, and scale of the digital era.

- **Delight customers with retail excellence:** CSPs will continue to invest heavily in their flagship stores as a way to present digital experiences and attract customers. Creating a seamless experience across all sales channels is imperative.

- **Optimize and modernize** financial systems to achieve real-time financial visibility and planning and improved margin insight while preparing for new IFRS regulations.

- **Optimize and modernize** network asset operations and maintenance. Predictive analytics based on sensor data enables smarter asset management with a fully digital allocation of spare parts, work, and logistics services delivered by the digital business network.

### REIMAGINE WORK

Reimagined business models and processes need an adaptive workforce with new skills.

- **Go green and digital** by replacing error-prone paper-based transactions with mobile digital processes in procurement, inventory management, invoicing and payment processing.

- **Broaden reach with interactive technologies:** Technology will accelerate the transition of people’s roles from transaction workers to exception workers. With real-time info at their fingertips, all CSP employees (field technicians, store employee, CSRs, etc.) can deliver personalized services and exceed expectations.

- **The right information at the right time on the right device:** Field service processes are supported or controlled by predictive and self-learning systems that interact with machines and business processes.
In this new digital era, telcos that fail to proactively adapt their business models will face strong headwinds that will erode both profitability and relevance. Business agility will become key, and embracing digital technology will be mandatory. Developing new revenue streams beyond traditional services will therefore be critical.

**Digital lifestyle provider**

Digital services, from mobile wallet and media entertainment, to wellness services and home automation, allow providers to engage the digital consumer more pervasively than ever before.

- Industry visionaries aspire to become “personal digital life agents,” offering services and making contextual recommendations and suggestions based on personal preferences and geo-location (e.g., mobile coupons).
- Unique personalized experiences are delivered to match subscribers’ interests (e.g., specific sport content delivery coupled with personalized fan experience and real-time offers).
- Creative digital offerings enhance the customer digital experience in partnership with dominant OTT players or as complimentary services.

**Digital transformation catalyst**

CSPs have the opportunity to power digital transformation in other industries. The emergence of a sensor-based world opens up the space for platform providers to deliver adapted and scalable solutions for connectivity, insight, applications, and processes in the Internet of Things (IoT).

- Offer sensor-friendly vertical services/solutions to enterprise customers or industry ecosystems (e-healthcare/tele-medicine, in-vehicle security or remote diagnostic in connected cars, etc.).
- Develop industry-specific stack and build competence and partner ecosystem around it targeting strategic industries, both organically or by acquisition.

**Data broker**

Positioned strategically at the heart of most digital traffic thanks to their networks, CSPs have a unique opportunity to become central actors in the data-driven digital economy.

- Power and monetize new data-driven models – collect, aggregate, and analyze high volumes of network data traffic via concepts like analytics-as-a-service, data science, or predictive analytics.
- Develop customer-centric data markets allowing third parties to consume and mesh data without infringing on privacy laws (e.g., opt-in models authorizing telcos to share specific personal and transaction data for improved personalization and offers from multiple businesses and industries).

**Business cloud service provider**

Telco operators have the right DNA and assets to be significant players as cloud service providers for businesses. They inherently understand scale, security, uptime, and reliability. They can propose adapted solutions to address both domestic data privacy concerns and local regulation requirements.

- Develop relevant offerings for small and midsize business (SMBs) and enterprises by creating the right portfolio for their markets.
- Nurture an ecosystem of solution partners to deliver business value to specific market segments or industry verticals.
- Participate in existing business networks for goods and services. Act as aggregators of demand on behalf of SMEs to achieve discounted rates from a network of suppliers in exchange for a transaction fee.

**NEW CONNECTED MODELS**

Deutsche Telekom T-Systems has helped the Hamburg Port Authority (HPA) optimize cargo handling in the Port of Hamburg and double its throughput capacity within the port’s limited area for cargo handling, thanks to a sensor-based connected logistics solution based on SAP HANA Cloud Platform.
Hyperconnectivity and digital customer expectations are changing the tempo in the industry. New thinking and boldness are required to capitalize on the opportunities of a real-time digital world while focusing on the right customers in increasingly saturated markets.

**Personalized engagement**

By analyzing high volumes of subscriber service consumption, behavior patterns, preferences, recent interactions, and context data, CSPs can develop fine-grain insight into their customer base and develop the right offers and campaigns for the right segments to be executed across the right channels. Based on the subscriber’s location or situation, they can also respond in real time to new events to quickly tailor unique offers.

**Retail excellence**

CSPs will continue to invest heavily in their direct channel, with flagship stores being seen as essential to showcase the latest digital experiences and attract connected audiences. In that context, focusing on all aspects of the retail experience will be paramount, from core inventory and merchandising to seamless cross-channel interaction (“click to brick” model).

**Smart network asset operations and maintenance**

Despite trends towards virtualization, smart network asset operations and maintenance will remain key drivers for cost-efficient, compliant operations on one hand, and customer satisfaction on the other. Predictive analytics based on sensor data enables smarter asset management with a fully digital allocation of spare parts, work, and logistics services delivered by the digital business networks.

**Agile service monetization**

To achieve shorter time to market for new services and make real-time decisions based on network traffic and managed policy, the need to establish a robust foundation for rating, charging, and billing has never been more critical. By making a break from complex legacy infrastructure, CSPs will have the opportunity to start fresh to establish a modern, responsive, digital platform.

**Simple finance, real-time insight**

Regulation changes (IFRS) will force CSPs to be more precise in the way they post results and report profits. By looking beyond pure compliance, operators have an opportunity to modernize their financial function to achieve real-time financial visibility and planning while improving their insight into margins at all levels.

**Connected supply chain**

With more brands introduced by operators to target specific markets or segments, supply chain management will increase in complexity. Expectations of seamless, omnichannel interactions will only exacerbate this trend and increase the need to envision a fully connected and extended supply chain.

**Services**

Innovative service offerings and processes can have a game-changing impact on customer relationships and the top and bottom line. All service processes will be digitally connected to the workforce, suppliers, customers, and assets for more efficiency and customer value.

Rogers Communications identified $100 million in savings opportunities by leveraging the Ariba Network.43

With SAP InfiniteInsight, Cox Communications saw a 14% increase in products/services bought per household thanks to optimized predictive models used across e-mail, direct mail, and telemarketing channels.44
REIMAGINE EVERYTHING

REIMAGINE WORK

The fundamental transformation from a telco to a digital service provider profoundly changes what people do and how they do it, and how they learn, interact, and grow.

Every substantial business transformation automates manual tasks, enriches jobs, and creates new work.

Digital business processes replace manual transaction work in procurement, inventory management, invoicing, and payment processing. Digital processes require access to real-time analytics to support rule-based decision making.

Interactive technologies broaden the reach and accelerate the transition of roles from transaction workers to exception workers. With real-time information at their fingertips, field technicians, store employees, and customer service reps can deliver personalized services and exceed expectations.

Predictive and self-learning software will accelerate the delegation of business processes and decisions from people to machines. Core processes will be supported or controlled by predictive and self-learning systems that interact with machines and business processes.

In the digital era, people continue to be key assets. Their roles will change, but their value will grow.

TELUS used SAP Jam to boost employee engagement from 53% five years ago to 83% and calls SAP Jam the “systemic social glue that ties the organization together.”
Telcos today are facing stagnant or declining revenue in their core business and are under tremendous pressure to reinvent themselves and create entirely new revenue streams while also optimizing costs and retaining existing customers. Telcos such as Vodafone, Rogers, Ericsson, and Everything Everywhere are taking steps to do just this. This involves two key concepts: **simplification** and **innovation**.

**Simplification** is all about doing what we are already doing, but better, faster, and cheaper.

**Innovation** is all about reimagining what it means to be a CSP with new business models and better customer engagement, leveraging the technology trends discussed earlier.

The diagram below is a good illustration of these concepts. The idea is very simple, but it took years to make it a reality: Consol...tating vast data resources, customer touch points, and billing relationships on the same platform. Vodafone Netherlands combined customer data with predictive analytics capabilities to create a more personalized offering, reducing churn and increasing services sold. In-memory computing is a concept brought to life by the breakthrough SAP HANA platform. The rapid adoption of SAP HANA across all industries validates its massive potential for digital businesses.

**SAP HANA PLATFORM**

With in-memory computing, we can now finally:

- **Leverage Big Data** from mobile devices, sensors, usage patterns, social, and geolocation sources. Bringing all data points together leads to better personalization, creating an optimal customer experience.
- **Extend the business process** to interoperate with business partners in near real time via advanced cloud-based business networks.
- **Deploy new business models** from Internet of Things services to mobile commerce, cloud services, and data monetization. Telcos can now successfully generate revenue from new services.

These capabilities open infinite new ways to optimize business, drive business digitization, simplify everything, reduce cost, and provide the agility required in a fast, changing world. Everything Everywhere, for example, is driving more revenue through its Web channel than its retail stores by leveraging an omnichannel commerce strategy.

SAP constructed an innovation road map designed to bring in-memory computing together with cloud computing and mobility. This strategy has been embraced by early adopters who are leading the transition to digital.
DIGITAL BUSINESS FRAMEWORK

A SIMPLE AND PROVEN APPROACH TO VALUE CREATION THROUGH DIGITIZATION

Every company across all industries requires a simple digital approach to build a pragmatic and executable vision on its digital strategy.
Every service provider needs to think about digitization across five key pillars:

1. Deliver outcome-based **customer engagement**
2. Re-platform **core business processes** to bring together transactions and analytics in real time to be smarter, faster, and simpler
3. Increase **workforce** engagement across all employees and contractors
4. **Improve supplier** collaboration to accelerate growth and innovation
5. Harness **Big Data** and the **Internet of Things** to drive real-time insights and new revenue streams and power the digital ambition of a multitude of other industries

CSPs are in a unique position to benefit from this framework. As the enabler of the digital life, CSPs can reinvent the nature of their interactions with their customers, employees, and suppliers. They can also establish themselves at the heart of the new Big Data or IoT-driven models – both for themselves and for other industries in need of help to power their own digital transformations.
THE DIGITAL CORE FOR THE DIGITAL SERVICE PROVIDERS

A new generation of ERP solution, running in real time, integrating predictive, Big Data, and mobile, will change how CSPs work, how they run the business, and how information is consumed. The future is here.

With advanced in-memory computing, you can finally free yourself from running the business in batch mode and building complex procedures to get around technology limitations. You can run simply and unleash the full power to transform into a digital service provider.

**Real time**
Real-time optimization of business-based changes will have massive implications for how digital service providers work, how they do business, and how they get organized.

**Power of prediction and simulation**
With the help of simulation and predictive tools, every employee can drive perfect decisions to retain the right customers, increase loyalty, or create the right bundles.

**Agility**
As consolidation continues in this industry, the ability to rapidly enter new markets and acquire and onboard new companies at speed will matter even more. Executing these changes in one-tenth of the time it takes with today’s systems is now possible and will enable the agility required in the digital economy.

**Deployment choice and lower TCO**
The consuming solution to run the core has to be simple. Companies now have the choice to deploy in-house or in the cloud. In-memory computing will also have a significant impact on TCO, and it will free up more budget for innovation.

**Consumer-grade user experience**
User experience is key to success: it drives adoption, user engagement, and, ultimately, productivity.

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94% of CSPs believe that the digital transformation is impacting their business significantly.⁴⁸

70% of CSPs are actively using technology to move towards a real-time environment, but only 20% are in advanced stages of deployment. ²⁹

Source: SAP “The Power of Real-Time” survey

23% of CSPs see “faster insight to action” as the #1 benefit to implementing a real-time environment.²⁹

Source: SAP “The Power of Real-Time” survey

50% of telco companies estimate revenue from new services to be in the range of 15-50%.²⁹

Source: Telco Transformation Micro Survey: Mobile World Congress

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**Simplify with SAP**

SAP’s digital platform can help digital service providers cover their core business processes with a modern in-memory-based architecture.
A single platform for marketing, sales, services, commerce, and billing ensures seamless digitization of the entire customer experience. SAP customer engagement and commerce solutions powered by SAP HANA enable a 360-degree view of your customer, real-time interactions, and sophisticated predictive analytics, fully integrated to the core transactional system.

**SAP Hybris**
- Orchestrate business processes across marketing, commerce, sales, and service
- Deliver personalized experiences in context with each interaction
- Create a single, harmonized experience for your customer across all channels and devices
- Be prepared to engage your customers on the channels they choose at any moment in their journey
- Achieve full integration with your core business processes

**SAP Cloud for Customer**

Three key trends are reshaping the customer experience:

**Outcome economy:**
The outcome economy requires a deep change in the business model and new organizational and business process capabilities. It also requires a more sophisticated and agile approach to product offerings and customer segmentation.

**Customer journey:**
Customers choose their own journey in multiple channels at their convenience—the pattern that emerges is not linear, as in the past.

**Big Data and marketing in near real time:**
Big Data allows CSPs to sense and respond to customers’ needs in real time, to tailor offers that are both personalized and contextually relevant. It can enable a fine-grained visibility of the right customer segments and subscriber behaviors to optimize both revenue growth and retention strategies.

82% of telco companies consider customer experience management as a top-three priority for their industry.49

74% of CSPs believe that having a unified view of customers is very important, yet 53% say they have little to no ability to do this today.29

Source: SAP “The Power of Context” survey

63% of CSPs say that delivering a consistent experience across channels is their top customer priority.29

Source: SAP “The Power of Context” survey

34% of CSPs see the ability to drive customer insight and segmentation as the top benefit of their Big Data initiatives.29

Source: SAP “The Power of Big Data” survey
WORKFORCE ENGAGEMENT

The world is getting smarter in the digital economy, but complexity is hampering the workforce in this pursuit.

Complexity is the enemy of workforce engagement. People are working harder than ever but are not necessarily accomplishing more. Workers do not have access to smart, consumer-grade technology to work faster, better, and more efficiently. Organizational complexity is driving costs up and slowing down progress. Four forces need to be addressed:

Changing of the guard
Over 50% of the workforce will be millennial by 2020. This will require a workforce strategy to address the new reality.

Contingent labor is on the rise
To drive agility, many communications service providers are turning more and more to contractors and services providers to serve customers, install equipment, or staff stores.

Constant reorganization
Reorganizing to adjust to the new reality is becoming a constant affair.

Complexity is on the rise
A number of CSPs do business in more countries across many more channels. Products and services are becoming more complex. Regulations are changing by the day. Layer upon layer of management is hindering speed and agility.

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Improve your total workforce productivity. Simplify with SAP

Digitize your workforce with SAP: SAP S/4HANA + SAP SuccessFactors + SAP Fieldglass + SAP Fiori provide the tools for total workforce engagement and advanced analytics.

- **Attracting the best workforce** Recruit and onboard the best workforce, simplify their work, and ensure that regulatory and compliance requirements are met
- **Managing the total workforce lifecycle** Manage the total workforce lifecycle from recruiting, onboarding, performance, compensation, and learning – all in one place
- **Smarter apps with greater user experience** Enable the workforce to easily access the right information across any device and through a dramatically simplified user experience

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**83%** of executives indicate they’re increasingly using contingent workers at any time and on an ongoing basis.51

**12%** bill rate decrease experienced at a Tier One CSP by streamlining services procurement.

**42%** lower HR cost (% of revenue) for services organizations where the HR system is integrated with ERP and other key non-HR systems to allow for end-to-end processes (e.g., asset management system, financial systems, CRM system)29

**30%** of executives say their companies give special attention to the particular wants and needs of millennials.51

“Markets are changing and we need to respond. Our clients’ demands are evolving. With our SAP SuccessFactors software platform, we are helping employees shape their careers in alignment with what the market is dictating.”52
Companies have to reimagine business processes to remain competitive and best serve customers in the digital economy. From sharing data in real time and securely, to providing personalized and contextual insights, to changing how companies exchange and offer products and services – collaboration across entire vertical markets is key to value creation. Several trends are redefining the game:

**Consumer buying experience**
Business applications must be effortless to learn and use, such as with iTunes, Amazon, or Google. Low adoption rates due to solution complexity drive users to find alternate channels that add up to additional expense from bad spend and lost opportunity.

**Network of networks**
An open network serving a single market (such as travel, suppliers, labor) is valuable to its ecosystem. But a vertical network that connects to other vertical networks in real time is revolutionary and can only be accomplished through a shared set of cloud-based services built on top of the SAP HANA Cloud Platform.

**Business connectivity at scale**
The greatest challenge and opportunity in connecting vast ecosystems is the exponential data growth generated and consumed by the network. Connecting millions of partners and processing petabytes of data in real time are the core requirements to becoming the de facto standard. Only SAP offers the platform to meet this challenge.

### Connect your business to the world and the world to your business

SAP S/4HANA gives you incredible capacity to digitize business processes across your internal operations. It is the connections to our customers’ global partner ecosystems that enables you to extend those processes externally beyond the four walls of your business.

- **Concur, SAP Ariba, and SAP Fieldglass cloud solutions** for travel and entertainment, direct and indirect material, and labor and services – connected, effortless, and at scale
- **Business networks operate on a global basis**, meet data security standards, and operate at industry best standards
- **Leverage services from partners** to vastly extend the value of core offerings

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**$100 million**
in new savings opportunities and full visibility into more than $10 billion in annual spend

**Networked companies**
are 50% more likely than their peers to have increased sales, higher profit margins, and be a market leader.

**50–75%**
faster transaction cycles are being achieved with the Ariba Network.

**“The most important thing for us was to have one standard global process. The second most important thing to us was to control costs and know how much we’re spending and analyze why we’re travelling. With Concur, we have all that.”**

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**Travel and entertainment**
![Travel and entertainment diagram]

**Direct and indirect material**
![Direct and indirect material diagram]

**Labor and services**
![Labor and services diagram]
BIG DATA AND THE INTERNET OF THINGS

The most dramatic change in the digital economy will be driven by hyperconnectivity and Big Data science. These will transform nearly every business model and provide a massive opportunity for CSPs.

CSPs at the heart of IoT for all industries
Companies are finally understanding the full potential of the interlock between physical and digital assets and the Internet of Things. We are witnessing CSPs becoming enablers of innovative IoT use cases and moving up the value chain from providing core network connectivity to fully verticalized IoT services across industries. Below are some examples:

Smart products drive new business models
Manufacturing companies are embedding sensors in their products and processes, and are rethinking the value delivered by their products. As a result, they are transforming more and more from physical products towards being service companies.

Big Data-driven business models
Industries like healthcare, media and entertainment, but also the CSPs themselves, are transforming their business models with the power of Big Data (e.g., aggregation, distribution, marketing, etc.)

Technology-driven customer engagement and engineering
Marketing and engineering are spending more and more on Big Data and sensor technologies as their function is the most transformed by these new technologies. CSPs and their services are at the core of the mobile, digital lifestyle.

Transformation driving new alliances
Seamless collaboration around new business models demands partnerships that may not have made sense few years back. Examples include partnerships between CSPs and automotive makers or the healthcare sector as well as many others.

Connect, transform, and reimagine with SAP
With SAP HANA, Internet of Things edition, CSPs will be able to help enterprises and organizations by providing IoT application as well as IoT application platform services to take embedded device data, analyze this data into information in real time, and leverage the information across the value chain to drive business insights and create new business models.

3 billion
Internet users and an expected 30-50 billion connected devices by 2020

$4–11 trillion
Estimated potential economic impact of the Internet of Things per year in 2025

74%
of telco companies believe that the ability to manage Big Data is a big differentiator
Source: Power of big data in Telecommunications: Mobile World Congress

Port of Hamburg
brings together port and road traffic conditions, truck availability, and incoming/outgoing shipment schedules to reduce idle truck/ship time. The solution, provided by SAP in cooperation with Deutsche Telekom T-Systems, allowed the port to increase container handling capacity by 178% within the same land area.
Dream, develop, and deliver with SAP HANA Cloud Platform

SAP HANA Cloud Platform gives you the mobile, collaboration, integration, and analytic capabilities you need to dream big, develop fast, and deliver everywhere with the following capabilities:

Application extensions
Extend your current cloud and on-premise solutions for additional customization, enhanced business flows, and more.

Real-time analytics
Engage customers, optimize business processes, and unleash new revenues with real-time analytic apps, powered by SAP HANA.

New cloud apps
Quickly build innovative consumer-grade and industry apps for today’s always-on, mobile, social, and data-driven world.

Extended storage capabilities
Holistically manage all structured, unstructured, and infinite data streams with flexible combinations of data stream processing, in-memory technology, disk-based columnar storage, and Hadoop-based storage solutions.

Data footprint reduction
Significantly reduce memory footprint and TCO. In ERP systems, we have seen ~6x reduction by SAP HANA’s dictionary compression. Removing aggregates and actual and historical data separation further reduces the footprint to ~10x.

The SAP HANA platform is...
Real-time, in-memory platform • 10x data footprint reduction for ERP • Extended storage, including Hadoop • Open architecture • Developer-friendly • Embeds mobile and analytics • Secure • Cloud-ready

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<th>New apps and services</th>
<th>NEW APPS</th>
<th>EXTENSION</th>
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<td>Security (SSO, Identify)</td>
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SAP HANA

Data platform (SAP HANA DB, SAP ASE)
Libraries (graph, predictive)
Big Data (Hadoop, Spark)

Infrastructure delivery
SAP data centers Partner data centers Customer data centers Elastic deployment

Vodafone Group
Vodafone is using SAP to gain efficiencies in its T&E processes for its 100,000+ employees. “Best practices is really to review 20% of your travel and expense claims. Our process before was only looking at 10% of the claims, so we were looking for a solution that could automate it and increase our control. We chose SAP Fraud Management on SAP HANA. It now enables us to review 100% of the claims and have a consistent control process.”

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HOW DOES IT ALL COME TOGETHER? – EXAMPLE

While each of the five digital business pillars delivers significant value as a stand-alone capability, the ultimate goal is to design the next generation of business processes that will span across all the digital pillars. Consumer engagement will not stop at the channel experience. Supply chain and services have to be aligned with the customer experience strategy if products and services are to be delivered as promised.

CONTINUOUS OMNICHANNEL CUSTOMER ENGAGEMENT

The process flow shown on this page portrays how digital service providers are beginning to engage more and smarter with their customers across multiple channels. In the new paradigm, digital service providers will be able to integrate currently disparate data sources, including retail channels, customer usage patterns, network data, and more, to bring together technology, data, and customer platforms into a single environment, enabling innovative business and engagement models.

The scenario above shows how customer, geolocation, network, and social data come together with all channels to drive next-generation best practices in customer engagement and commerce. The personalized nature of the solution will change how people perceive their service provider and will allow telcos to truly evolve into digital lifestyle providers.

The benefits of this scenario are significant:
- Higher customer satisfaction
- Lower customer churn
- Increased revenue
- New services and new revenue streams.
HOW TO START

THE JOURNEY TO THE DIGITAL SERVICE PROVIDER BEGINS WITH A CAPABILITY ANALYSIS THAT RESULTS IN THE TRANSFORMATION AGENDA
THE JOURNEY TO THE DIGITAL
The journey to define future business models for CSPs involves all industry disciplines and requires a systematic approach to identify and capture business opportunities.

The collaborative value and innovation framework
CSPs embarking on the transformation journey to the digital business typically start to reimagine their business with a focus on business outcomes and customers. Answering the key questions, “What role will we play in the service provider value chain?” and, “What types of services will drive our profitability?” will provide direction for reimagining your business processes and operational model.

For innovation today, a new level of collaboration is required. As a result, we have developed a framework that will be a continuous and holistic partnership model designed to drive true collaboration and engagement. Outlined below are the five steps of SAP’s collaborative value and innovation framework.

1. **Strategy alignment**: Understand company and SAP strategic direction and identify initiatives
2. **Opportunity assessment**: Opportunity deep-dive based on strategic initiatives and prioritization based on value
3. **Solution road map and ROI**: Document end-state solution and business case including benefits, TCO, ROI, and strategic road map
4. **Value realization**: Deliver transformation on time, on budget, and on value
5. **Governance**: Maximize investments and accelerate value creation with governance based on executive engagement, value delivery, and continuous innovation
WHY SAP?

SAP ENABLES THE TRANSFORMATION FROM COMMUNICATION SERVICE PROVIDER TO DIGITAL SERVICE PROVIDER
VISION

Help the world run better and improve people’s lives

MISSION

Help our customers run at their best

STRATEGY

Become the cloud company powered by SAP HANA

CUSTOMER RETENTION IN A DIGITAL AGE

Vodafone Netherlands relies on SAP InfiniteInsight to predict customer churn and make customers aware of products and services that help them enjoy their digital lifestyle anytime, anywhere.46

DRIVING COMMERCE THROUGH DIGITAL CHANNELS

Everything Everywhere, the UK’s first operator to launch 4G, leverages the SAP Hybris solutions to support its core digital business while also extending a consistent commerce experience into other channels, customer touch points, and product categories.47

EARLY FLOOD DETECTION IN INDIA

With SAP HANA and SAP Predictive Analytics, water levels can be monitored in real time to alert the population about the floods and ultimately save lives.49

GLOBAL PRESENCE AND RELEVANCE

- 77K employees representing 120 nationalities
- 300K customers
- SAP operates in 191 countries

INDUSTRY AND LOB FOCUS

- Solutions for 25 industries and 11 lines of business
- 98% of top valued brands are our customers
- 74% of the world’s transactions are managed on SAP

DIGITAL ECONOMY-READY

- 95 million business cloud users
- 2.0 million connected businesses
- $740 billion+ in B2B commerce
- 99%+ of mobile devices are connected with SAP messaging

INNOVATION LEADER

- 2011 SAP HANA launched
- 2012 SAP Cloud launched
- 2014 SAP business networks are the largest marketplace in the world
- 2015 SAP HANA Cloud Platform
- 2015 SAP S/4HANA: most modern ERP system

DIGITAL CSPS ENABLED BY SAP

- 10 of the top 10 global operators run SAP
- 94% of CSPs in the Forbes Global 2000 are SAP customers – 4,500+ in total
- 1.8 billion mobile messages processed every day by SAP
CREATE COMPETITIVE ADVANTAGE THROUGH INNOVATION

SAP will bring simplification, innovation, and acceleration required to support the development of your digital business strategy. These capabilities will be leveraged throughout SAP’s collaborative value and innovation framework.

**SIMPLIFY**
business processes, customer experiences, and IT architecture with the next-generation business suites.

- Reduce churn, increase loyalty, and gain insights into customer data with a unified view enabled by the SAP HANA platform
- Provide a seamless customer experience through all channels with an integrated, flexible customer and commerce platform
- Achieve seamless integration between billing and G/L to provide real-time visibility and agility with data on the most granular level

**INNOVATE**
to fully execute the role of the enabler of enterprise digital transformation by providing combined communication and IT offerings to business customers.

- Combine the power of mobility, Big Data, and cloud services to provide IoT services to businesses, including predictive maintenance, smart agriculture, etc.
- Leverage network, customer, and usage data to deliver data monetization offerings
- Drive revenue by partnering with SAP to provide enterprise customers with SaaS in the areas of finance, HR, e-commerce, etc.

**ACCELERATE**
decision making and respond instantly to the changing markets with predictive analytics and the real-time data platform.

- Greatly shorten time to market while providing the most relevant and personalized offerings
- Predict and prevent high-impact incidents (e.g., network outages, telco fraud) more quickly and accurately
- Speed up mission-critical decision making with business insights from accelerated processes, e.g., month-end closing, profitability reporting, etc.
In the digital economy, simplification and business innovation matter more than ever. SAP has a broad range of services to cover the end-to-end transformation journey, ranging from advising on an innovation road map and plan, to implementing with proven best practices, to the ability to run across all deployment models, and ultimately optimize for continuous innovation across your digital journey. SAP provides both choice and value within our services, allowing you to tailor the proper approach based on your needs.

Turn to the 30,000 consultants and support professionals who can bring your digital strategy to life. SAP’s Global Service & Support organization (GSS) provides a consistent experience – on premise, cloud, or hybrid. GSS offers the expertise, assets, and the proven methodologies required to accelerate business innovation, reduce TCO, and run a stable platform (on premise or in the cloud).

SAP Activate is a new, simplified consumption experience introduced for SAP S/4HANA and cloud adoption with a combination of SAP Best Practices, methodology, and guided configuration. In addition, we provide leadership in learning to drive quick time to value realization and a solid engagement foundation with SAP MaxAttention, SAP ActiveEmbedded, and SAP Value Partnership across the end-to-end customer lifecycle.

Global Service & Support – the expertise, assets, and proven methodologies required to accelerate business innovation, reduce TCO, and run a stable platform (on premise, in the cloud, and hybrid)

ADVISE
Simplify and innovate
- Digital innovation road map and plan
- Co-innovation by industry

IMPLEMENT with proven best practices
Implement with SAP Activate
- Simplified consumption experience for SAP S/4HANA
- SAP Best Practices, methodology, and guided configuration

RUN all deployment models
Run with one global support
- One global, consistent experience
- End-to-end support – on premise, cloud, hybrid

OPTIMIZE for continuous innovation
Optimize to realize value
- Continuously capture and realize benefits of digital transformation

Learn | Extend / Innovate | Engagement Foundation | Support
SAP COMPREHENSIVE ECOSYSTEM
Orchestrating the hyperconnected world

Our comprehensive ecosystem for telecommunications offers value in terms of:

- Supporting the innovation and growth of the telco business with increased agility, flexibility, and responsiveness
- Better customer engagement and commerce, helping to improve operational excellence and drive new digital efforts
- Open architecture: choice of hardware and software
- Complementary and innovative third-party solutions
- Reach – partners to serve your business of any size, anywhere in the world
- Forum for influence and knowledge
- A large pool of industry experts with broad and deep skill sets

Our partner ecosystem includes, among others:

- Accenture
- Apigee
- Deloitte
- DigitalRoute
- Greenlight Technologies
- OpenText

BUSINESS NETWORK
- 2.0 million suppliers
- 200 major travel partners (air, hotel, car)
- 50K service and contingent labor providers

INFLUENCE FORUMS AND EDUCATION
- 32 user groups across all regions
- 40+ industry councils
- SAP community >24 million unique visitors per year
- 2,400 SAP University Alliances

IMPLEMENTATION SERVICES
- 40 telco partner companies
- 800 service partners

INNOVATION
- 1,900+ OEM solution partners to extend SAP solutions
- 2,700 startups developing SAP HANA apps

PLATFORM AND INFRASTRUCTURE
- 1,400 cloud partners
- 1,500+ platform partners

CHANNEL AND SME
- 100 Telco channel partners
- 4,800 overall channel partners

DRIVING CUSTOMER VALUE
- 2.0 million suppliers
- 200 major travel partners (air, hotel, car)
- 50K service and contingent labor providers
ADDITIONAL RESOURCES

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


8. “WhatsApp now has 700m users, sending 30B messages per day”, by Kika Kokalitcheva, VB News, January, 2015 http://venturebeat.com/2015/01/06/whatsapp-now-has-700m-users-sending-30b-messages-per-day/


11. 5 Things Brands Need to Know About WeChat, China’s Mobile Giant, Ad Week, December 2015 http://www.adweek.com/news/technology/5-things-brands-need-know-about-wechat-chinas-mobile-giant-168588


26. Source: SAP customer data


29. Source: SAP Benchmarking Data & SAP Customer Surveys. Results available upon request.


ADDITIONAL RESOURCES
Outlined below is additional external research that was used as supporting material for this white paper.


Note:  All sources sited as “SAP” or “SAP benchmarking” are based on our research with customers through our benchmarking program and/or other direct interactions with customers

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