Future of XaaS

Signals of change

KPMG International

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Foreword

Over the last two decades, the as-a-Service model has revolutionized how technology resources (software, platforms, infrastructure) are provisioned and consumed. From a consumption perspective, there has been a rapid migration to on-demand environments that can be provisioned through self-service, with elasticity to allow rapid scaling and ubiquitous availability through multiple access channels and with billing flexibility.

To cater to this rise in demand, we have seen many born-in-the-cloud providers emerge as market leaders in their respective category segments and continue to see a large number of providers move from perpetual/term license models to subscription/as-a-Service models. The success of this operating model in the technology world has also given rise to companies in a variety of other industries adopting this model. We call this trend Everything-as-a-Service ("XaaS"). Despite this rapid growth, XaaS companies are still highly challenged by three key issues:

1. *Transforming their operating model(s) to realize a true "connected enterprise" to help provide a seamless customer experience*
2. *Maintaining margin while offering competitive pricing and product agility to their customer base*
3. *Managing the cost of delivery to remain competitive in the market.*

In this point of view, we explore the critical signals of change currently influencing the XaaS industry and how XaaS companies might address the three challenges outlined above. Consumers of XaaS are becoming increasingly demanding about:

1. *The experience they want to receive*
2. *The value they want XaaS providers to deliver*
3. *Reliability of the product offering*
4. *The cost structure they would want to commit to.*

COVID-19 has accelerated the movement to XaaS in leaps and bounds.

The XaaS world has many business model variations. The more traditional perpetual and term licensing models are rapidly being replaced with models ranging from subscription, consumption to freemium and marketplace-based models. These variations flex on dimensions such as how they define ownership or right to use, payment mechanisms, payment timings, units of payment etc.

We describe the different paths companies can chose to help enable a XaaS first model, and the not insignificant challenges to overcome to help ensure the right path for their company.

Providers that are transitioning from a traditional solution model to a XaaS mode should deal with several transformational challenges:

1. *They should have a nimble product strategy to continuously remain relevant and differentiated*
2. *They should maintain a laser focus on the experience customers are having of the XaaS product.*

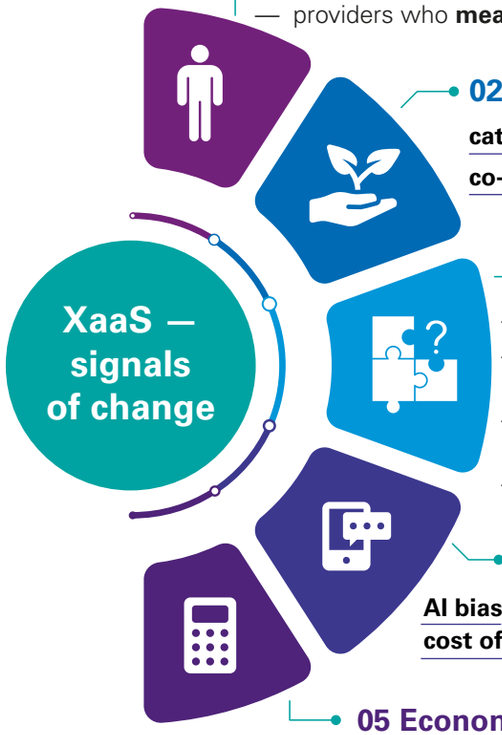
This requires an agile engineering frame of mind, a culture that delivers continuous innovation, and a front office that reaches the addressable market through a variety of channels while being supported by a middle and back office that is efficient and automated to meet the challenges of an on-demand model.

We hope this point of view provides leaders and stakeholders in the sector with valuable insights to help them move into the future with confidence. To discuss these themes in more detail, or to explore how KPMG professionals can help your organization become a true connected enterprise, we encourage you to contact your local KPMG firm or any of the authors listed at the back of this publication.

Signals of change

Signals of change

The XaaS sector is in the perfect storm of change. A number of factors influence the nature of how the XaaS sector designs product offerings, approaches its market, and provides compelling value to its customer base. We will analyze the following signals of change in greater detail:



01 Customers demand

- **new levels of value and service**, while wanting XaaS providers to price for value
- vendors **aligned to broader values**
- providers who **measure what matters** for customer experience

02 Competitive environment drives

category saturation **industry specialization**
co-opetition **vertical integration**

03 Regulatory challenges include

- **cyber security, data privacy** and **data localization**
- commercial regulations covering **antitrust, digital tax**
- protection and ownership rights of **intellectual property**
- operational regulations such as those for **AI ethics**

04 Technology signals cover

AI bias **democratization of platforms** **DevSecOps**
cost of outages **self-service/self-healing**

05 Economic factors

- create operational considerations including **offering shaping**, **compensation agreements** and adopting XaaS metrics
- increase major shifts to **asset light, subscription models**

A number of factors influence the nature of how the XaaS sector designs product offerings, approaches its market, and provides compelling value to its customer base.

Customer

In a recent **global KPMG survey, 56 percent of XaaS providers** rate their customers' experience as **'average' at best**.[1]

Fast-maturing customers are increasingly clear about the kinds of XaaS services they seek, including flexible pricing to meet varying needs. They also want to work with vendors who share — and demonstrate — similar environmental, social and governance (ESG) values.

Customers are demanding new levels of value and service

As they strive to gain the agility to adapt to changing market conditions, customers expect their XaaS providers to become more intimate business partners. This means working closely together across the entire relationship lifecycle, in order to help continually improve every interaction, balancing frequency of releases, ease of upgrades, self-service capabilities, simple renewals and flexible pricing. To effectively co-innovate, XaaS players should understand what value really means to customers and factor such feedback into new product development.

This does require XaaS players to rethink their customer segmentation — what worked in the past is probably not the best, and should not be the only lens to see the future through. Providers should strike the right balance between standardizing their offers and configuring what feels like a personalized quote, to meet the more granular emerging segments. Connecting frontline feedback to the product roadmap can help accelerate customer-backed-innovation, which should be prioritized based on value at stake, and in alignment with overall commercial strategy.

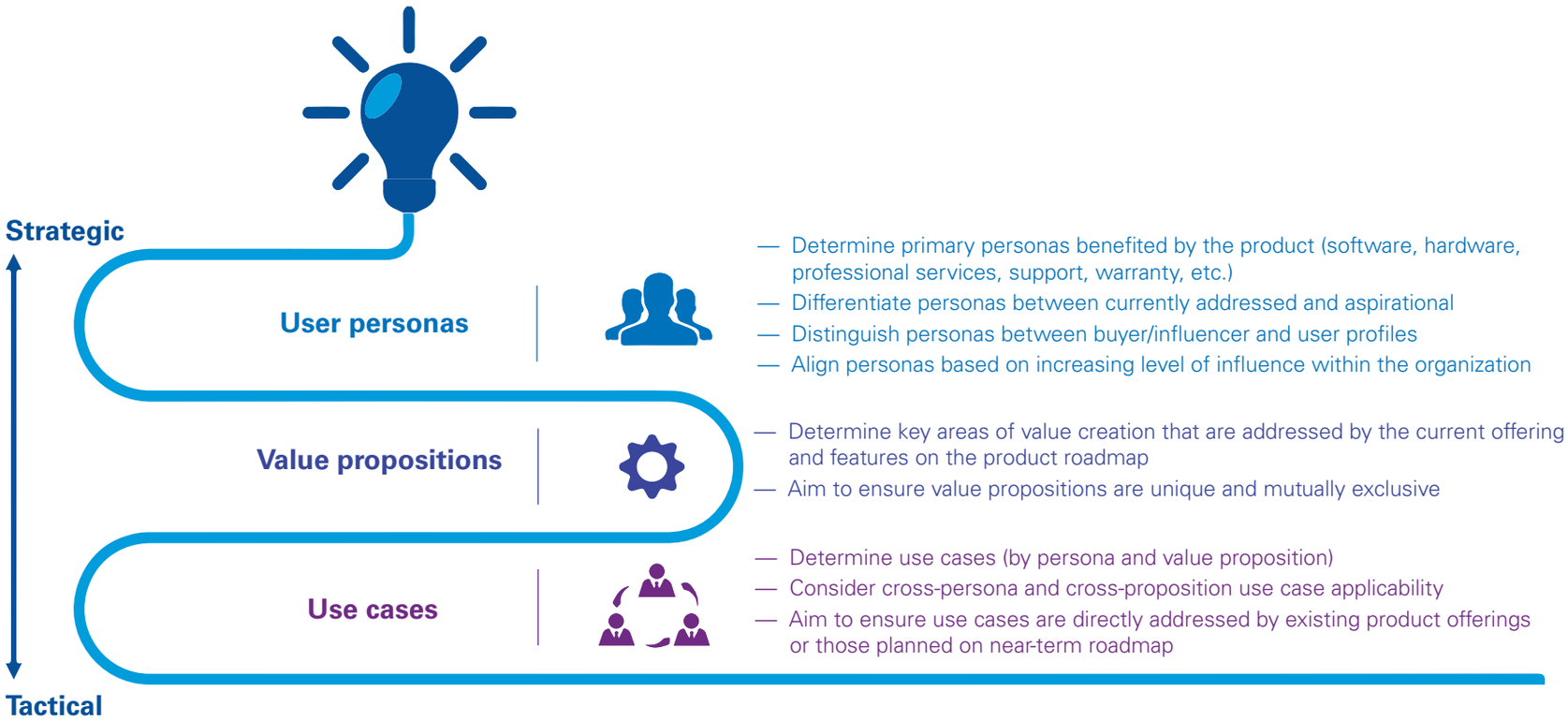
It is equally vital to remember that not all products are created equal.

[1] Source: A commissioned study conducted by Forrester Consulting on behalf of KPMG, April 2021. Base: 355 professionals involved with customer strategy decisions at organizations providing cloud services.

Customers want XaaS providers to price for value

To satisfy diverse demands, XaaS providers are devising complex product offerings and pricing strategies. According to a 2021 KPMG-commissioned study conducted by Forrester Consulting, seven out of 10 XaaS providers feel they can effectively articulate their product architecture, implement a dynamic pricing strategy, and optimize resources to improve product quality. Given this complexity and a need to get the 'value' right, there are a few important pricing-model related considerations for the XaaS industry:

Dynamic pricing/price optimization: Offering solutions at different prices depending on a range of dynamic inputs, enabling XaaS vendors to adjust products and services according to factors like perceived value, competitor pricing, supply, demand, conversion rates and sales goals. Such an approach enables a win-win pricing model that is built on the idea of fair-exchange of value between customers and XaaS providers. Taking customer segmentation further, to the point where clear use-cases can be identified for each segment, and then associated willingness-to-pay can be estimated, can then help maximize monetization anchored on the value delivered.



Bundle pricing: Customers are increasingly looking for solutions versus point tools. XaaS providers need to identify the building blocks for the solution packaging options — spanning across hardware, software and services (e.g., customer security services and software, accidental damage protection, and other disaster recovery services, etc.). Pricing bundles for value requires a clear understanding of perceived value and potential role of these building blocks in monetization. Some capabilities will likely drive the incremental outcomes leading to increased willingness-to-pay, while others may be table stakes. These factors often drive the difference in what goes into the good versus the better versus the best offers in the commonly used feature differentiated bundling designs.

Build capability

- Modifications to the billing system and process (e.g., customer entitlement and capabilities to handle detailed breakdown of billing fees)
- Training of sales personnel to sell based on appropriate pricing strategy for a customer

Build transparency in pricing

- Customers should be aware of the factors influencing pricing
- Clear information about price changes should be given in advance to avoid customer complaints

Curate pricing strategy based on type of customers

- Always have a basic price option in place
- Customers who do not have large customizations and are regular users require stable plans

Do not turn dynamic pricing into price discrimination

- Profiteering from unforeseen or unfortunate circumstances not only can result in negative perceptions from customers but also may carry legal implications.

Value alignment: While pricing for value is key, it is also important to deliver on your margin goals. Doing so requires good visibility into underlying cost drivers — such as cloud costs, understanding how these costs scale across different sizes and types of customer segments (e.g., for corporate headquarters with higher numbers of intensive users versus remote/branch locations with a few sporadic users) and ultimately helping to ensure your costs are aligned with how you charge for value. Choosing the right pricing bases is key to an effective price model, and the ideal choice should scale with customer growth and success. A good model should aim to ensure that while the customer pays for the value they get, the bundles are ring-fenced so that the underlying costs remain aligned with the level of value delivered.

An effective pricing meter enables you to:

- Extract value delivered
- Differentiate between customer segments
- Align revenue with cost and risk
- Overcome customer buying constraints
- Bypass psychological thresholds
- Differentiate from competitors

Key considerations:

- Which pricing basis/bases align best with your product's value proposition goals?
- Which ones scale with customer growth/success?
- Which ones would be attractive/acceptable to customers?
- How do you split the value between primary (monetization) and secondary (ring-fencing) bases?
  - Examples of primary: Platform fee, usage-based (# of API calls, # of IP addresses under management), seat/capacity (# of licenses)
  - Examples of secondary: Limiting exposure to cost drivers (cloud costs), data/API limits

It is all about customer experience but measure what matters

In a recent global KPMG survey, 56 percent of XaaS providers rate their customers' experience as 'average' at best. The Chief Customer Office and the Customer Experience function should step up their focus on customer outcomes, looking at issues such as licensing models, routes to market (i.e., self-led, partner-led, marketplace, self-service, direct to customer), bundling methods, and introducing industry specific features into products.

The disconnect between self-reported capabilities and delivery on customer experience is consistent globally:

	North America	Europe	Asia-Pacific
Top areas of execution [Good/excellent]	84% Improve profitability	86% Improve profitability	81% Improve profitability
	81% Improve the quality of the customer experience	77% Improve the quality of the employee experience	72% Improve the quality of the employee experience
	74% Drive operational efficiencies	77% Explore new business models/revenue streams	**71% Improve the quality of the customer experience**
	73% Improve the quality of the employee experience	**73% Improve the quality of the customer experience**	68% Modernize and future-proof IT infrastructure/operations
Delivery on customer experience expectations	45% Exceeds expectations occasionally/consistently	45% Exceeds expectations occasionally/consistently	42% Exceeds expectations occasionally/consistently
	48% Experience meets expectations	33% Experience meets expectations	45% Experience meets expectations
	8% Fails to meet expectations occasionally/consistently	22% Fails to meet expectations occasionally/consistently	13% Fails to meet expectations occasionally/consistently

Note: Some percentages to do not add up to 100 percent due to rounding
Base: 355 professionals involved with customer strategy decisions at organizations providing cloud services; 80 in North America, 145 in Europe, and 130 in ASPAC
Source: A commissioned study conducted by Forrester Consulting on behalf of KPMG, April 2021

XaaS providers have the unique advantage in terms of their ability to provision telemetry to measure various aspects of customer experience in real time. However, while reviewing real-time telemetry requirements from products, more does not necessarily mean better. One needs to define the exact sets of information that would drive the right product strategy. One should measure what matters. Customer success instrumentation should factor in customer segmentation, as one would like to focus customer success representatives where there is the most-significant potential for expansion. It is harder to make small incremental changes for tier two customers where the product footprint is small.

Customers seek vendors aligned to broader values

ESG has become a critical, board-level issue as companies seek to combat climate change, create resilient supply chains, encourage diversity, inclusion and equality, and support local communities. Investors expect organizations to report on their non-financial impacts and more frequently base decisions on companies' ESG performance. Customers also prefer to do business with XaaS providers whose values match their own.

According to KPMG's 2021 CEO Outlook Pulse Survey,[2] 49 percent of CEOs plan to put in place more stringent ESG practices, while 96 percent are placing greater focus on the social component of their ESG programs. The previous 2020 survey found that 65 percent of CEOs say managing climate-rated risks will be a key factor in keeping their jobs over the next five years.

Sustainability is no longer a 'nice to have' but a business imperative and a source of competitive advantage. We're seeing more and more examples of ESG initiatives from the XaaS sector, including:

Recycling: Partnerships with local recycling organizations and offering optional recycling resources as part of the service.

Giving back (monetary and volunteerism): Some XaaS companies have launched funding initiatives and are donating a portion of their earnings to causes relevant to their business.

Employee health/wellbeing and board governance: Developing software and bots that check in on employees to boost morale and mental health. This software can allow anonymous questions to senior executives, connect employees based on their interests, and let employees submit workplace feedback.

Discounts or concessions during crisis: Giving employees discounts for items or services that may be of value to them during pressing times.

Hybrid workforce: Reducing the need for physical meeting places, enabling businesses to reduce carbon emissions from infrastructure and commuting, and giving employees the option to work in an environment that suits them best.

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[2] Source: https://home.kpmg/xx/en/home/insights/2021/03/ceo-outlook-pulse.html

Competitive environment

With certain mainstream segments becoming over-saturated, XaaS players should carve out distinctive niche products and industries, forming partnerships with competitors to gain a stronger foothold and reputation.

Category saturation

After initial hesitation, customers have finally and fully embraced XaaS, recognizing its superior agility and cost-effectiveness compared to traditional on-premise software models. As evidence of this pronounced shift, a recent survey found that 86 percent of organizations expect nearly 80 percent of all their apps to be SaaS post-2022, and 61 percent cite 'migrating workload to cloud' as their top priority for 2021, with companies anticipating using an average of 16 SaaS apps every day.[3] However, in the rush to meet this rising demand, certain categories have been saturated with an excess of products, such as customer relationship management (CRM — used by 87 percent of businesses) and procurement apps.

Less-crowded categories with growth potential include databases, artificial intelligence (AI) and content management. Another differentiating tactic is to adopt a micro-XaaS model, packaging core services as an application programming interface (API) and a suite of small tools. For example, an API that allows customers to enrich users/contact data, rather than using a traditional 'contact enrichment tool'. This approach lets clients create a user experience tailored to their specific needs, although even here there is the potential for saturation. Micro-XaaS companies provide services that can overlay on existing saturated segments such as office productivity.

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Industry specialization

Industry-specific 'as a service' applications offer an alternative to broad applications for functions like sales, accounting, human resources (HR) and CRM. Leading research agencies have also backed this trend, which has the capability to capture, store and analyze industry-specific data, providing better customer intelligence and more-customized reporting.

For example, machine learning (ML) and artificial intelligence (AI) capabilities can be adapted to many industries, such as built-in data privacy compliance options for the healthcare and financial services

[3] Source: Ariella, Sky. "30 SaaS Industry Statistics [2022]: Trends + Analysis." *Zippia*, Inc., 5 January, 2022.

sectors, secure ID ‘passports’ for online education, and monitoring fish stocks in the ocean. With so many variations of vertical XaaS products being created, this software has a huge worldwide potential.

Co-opetition

A growing number of competitors are collaborating to deliver hybrid, as-a-service models and share risk.

Such alliances highlight the rise of co-opetition, creating ‘open data’ ecosystems where ‘common’ data or code can be freely used, re-used, redistributed, and combined with other open data. This interoperability dramatically enhances the capability to combine different datasets and develop more and better products and services.

Vertical integration

Many dominant technology companies are vertically integrating into software, hardware, content and services to help improve efficiency and reduce costs. Meanwhile, some are planning to invest in transoceanic cables to offer domestic middle fiber capacity.

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Regulatory challenges

The increasing incidence and severity of cyber-attacks, along with concerns over data sovereignty, have led to evolving regional and national regulations and compliance standards covering storage and use of data. Emerging technologies like AI have accelerated this trend, and 'as a service' providers should respond by adopting 'security, ethics and compliance by design' for products.

Regulations fit into three broad categories:

- **Cyber security, data privacy and data localization**
- **Commercial regulations**
- **Operational regulations/ethics**

Cyber security, data privacy and data localization

Publisher or platform?

Most social media platforms are granted 'intermediary' status, legally protecting them against content published on their channels — but this situation may not last. Yet, that hasn't shielded companies from lawsuits for failing to comply with new and changing government regulations.

In future, it seems likely that XaaS companies who generate or facilitate content will have to identify as either publishers or platforms, which carries huge legal implications. While tech companies still have a responsibility of care and duty to remove any content that violates federal criminal laws, however, they currently can't be held responsible for users spreading misinformation through the platform. However, with a growing requirement for regionalized compliance officers, there will likely be increasing expectations of compliance and regulatory oversight.

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Regulations based on data privacy

There are many national privacy laws limiting the disclosure of personal information to third parties. Companies doing business in certain countries may be prohibited from transferring data to a third-party cloud provider for processing or storage outside that country. The alternative may be to provide customers with local storage at additional cost.

Examples of data protection laws include:

1. Abu Dhabi Global Market (ADGM) introduced Data Protection Regulations 2021, aimed at increasing the protection of personal data processed in the Emirate.
2. China's Cybersecurity law (article 37) requires IT infrastructure operators to store all personal information collected from users (sales, marketing, accounting, etc.) within the country's mainland territory.
3. Europe's Digital Services Act aims to create a common set of rules on intermediaries' obligations and accountability across the single market. This should open new opportunities to provide cross-border digital services, while ensuring a high level of protection to all users, no matter where in the EU they are based.
4. Data privacy laws in the US are gaining ground with the CCPA (California Consumer Protection Act) and similar bills in Virginia and Florida.
5. India's Personal Data Protection Bill (PDPB)

Data breach regulations shaping the industry

Cyber-attacks and data breaches are influencing the way XaaS companies operate, forcing them to focus on cyber security. After a leading tech giant compromised the personal data of 530 million users, it was subjected to class-action lawsuits in Europe and the US — specifically California. A federal judge approved a settlement for the company to submit to independent audits of its data security measures for the next five years.

Commercial regulations

Antitrust laws

The US government has the power and the responsibility to prevent corporations from becoming monopolies, with antitrust laws in place to promote free and open markets, keeping a check on market allocation, bid rigging, price fixing and mergers and acquisitions.

The Sherman Act prohibits agreements among companies not to compete, for instance by colluding to fix prices. The Clayton Act was designed to prevent mergers and acquisitions that consolidate excessive market power in one company.

In recent investigations, the US federal government has repeatedly charged technology companies for violating antitrust guidelines. These regulations and lawsuits have forced companies to rethink the expected benefits of organic versus inorganic growth, given the increased scrutiny over acquisitions.

> Abu Dhabi Global Market (ADGM) introduced Data Protection Regulations 2021, aimed at increasing the protection of personal data processed in the Emirate.

Regional and industry-specific regulations

The swift adoption of cloud computing has put data sovereignty under the spotlight, with countries passing laws to regulate and control data storage and transfer, making data subject to laws and governance in the territory where it was collected.

These laws now reach beyond sectors and carry steep penalties — for example organizations can be fined up to 20 million euros (EUR) for failure to comply with GDPR. Data localization refers to the requirement to keep certain types of data within the country of origin. Additionally, some nations place significant limitations on data transmission, either outside the country of origin or cross-border. Such regulations are forcing XaaS companies to rethink where they store data and move away from global data hubs.

Industry specific regulations

Sectors such as healthcare, government agencies and finance require stringent data protection systems and are governed by strict data regulation laws such as GDPR in the EU and the US's Criminal justice Information Services.

The Intermediary Guidelines and Digital Media Ethics code in India has established regulations on health-related data, geo-location information and the 'right to be forgotten' (individuals wanting to remove their personal data off the internet). It also includes as-a-Service components, making it even harder to comply with digital taxation for 'straight-through' process transactions.

Adopting 'compliance-as-a-code' to tackle regulatory and internal compliance

Compliance-as-a-code can help companies cater to regional regulations, combining the flexibility of minimum, common global regulations with additional, location-specific compliance add-ons.

Common policy compliance-as-a-code can help build compliance capabilities, with a regulatory database tracking global and regional policies such as GDPR, CCPA (California Consumer Privacy Act), HIPAA (US Health Insurance Portability and Accountability Act) and PCI DSS (Payment Card Industry Data Security Standards) — which are all regulations established by government authorities or industry groups.

Compliance-as-a-code is a useful strategy for enforcing both regulatory and internal compliance rules, to assist with ensuring privacy by design.

Digital services tax

Rapid and extensive digital transformation has sparked discussions in many legal and regulatory realms including international tax, with a wide-ranging impact upon direct and indirect taxation, broader tax policy issues and tax administration.

At the center of the debate is the question of whether international income-tax rules, developed more than a century ago, remain fit for purpose in the digital global economy. The fundamental elements of global tax which determine where taxes should be paid, and what portion of profits should be taxed, have enshrined tax certainty, and helped to eliminate double taxation, thus stimulating global trade.

France imposes a 3 percent digital services tax on revenues generated in the country by digital companies, regardless of where they are established, if their annual supply of taxable services exceeds EUR25 million (US$30 million) in France and EUR750 million (US$900 million) worldwide.[4]

In the ASEAN region, Singapore, Indonesia and Malaysia charge a digital service tax, while Thailand has announced forthcoming plans to tax foreign digital service providers.

Over the last five years, India has been aggressively pushing for increased tax on digital transactions, specifically targeting foreign companies with no permanent establishment in India who, up to now, have not had to pay local income tax. India is not alone in imposing tax on digital sellers.

Meanwhile, negotiations involving 140 countries are underway at the Organization for Economic Cooperation and Development (OECD), to overhaul international tax rules to adapt to the fast growth of internet economies. The OECD's decision on cross-border tax rules will provide clarity on the tax liability of companies providing digital services or selling online. The plan for effective implementation of the decision is slated for 2023.

The countries that currently impose the digital tax point to how internet giants or large e-commerce platforms are able to 'book profits in low-tax countries' regardless of where their customers are located — which necessitated changes in the existing framework of international taxation.

Operational regulations/ethics

Regulations on AI — AI ethics

In April 2021, the EU proposed new regulations governing the use of AI. Despite having left the EU, the UK lending market is intrinsically linked to the European banking sector, and larger trading blocs tend to dictate the likely direction of travel for smaller markets such as the UK. Therefore, it is reasonable to expect UK legislation to continue to closely mirror that of the EU.

[4] Source: Schulze, Elizabeth. "France targets Google, Amazon and Facebook with 3% digital tax." *CNBC*, 6 March, 2019.

Companies are required to adopt design procedures and practices such as:

— Providers of AI systems must establish appropriate data governance and management practices and use datasets that are relevant, representative, free of biases and complete.[5]

— Consequence scanning should be adopted to incorporate ethical AI design into product development.

— High-risk AI systems should be designed to allow users to oversee them in order to prevent or minimize potential risks. Design features must enable human users to avoid over-reliance on system outputs (automation bias) and allow a designated human overseer to override system outputs.[6]

— A system's technical documentation should contain metrics used to measure potentially discriminatory impacts and information about the foreseeable unintended outcomes and sources of risks to biases and discrimination (intended or unintended).[7]

— Companies should prohibit AI systems from providing social scoring for general purposes by public authorities. The regulations also preclude the use of "real-time" remote biometric identification systems, such as facial recognition, in publicly accessible spaces for law enforcement purposes.[8]

These changes are expected to make it harder to develop AI based applications and have far-reaching implications on as-a-Service providers — especially those based in the US. They would also impede the use of data analytics in as-a-Service applications.

[5,6,7] Source: MacCarthy, Mark and Propp, Kenneth. "Machines learn that Brussels writes the rules: The EU's new AI regulation." *The Brookings Institution*, 4 May, 2021.

[8] Source: "Proposal for a Regulation of The European Parliament and of The Council: Laying Down Harmonised Rules on Artificial Intelligence (Artificial Intelligence Act) and Amending Certain Union Legislative Acts." *European Commission*, 21 April, 2021.

Technology

Emerging technologies like IoT (Internet of Things), AI and edge computing are expected to have an impact on the design and marketing of products. XaaS companies should consider issues such as cyber security and code barriers, to enable customers to design their own interfaces.

AI bias

Bias can be due to a range of factors, namely poor algorithm design, bias in sample selection and design (for example, excluding significant data sets), and data that conforms too closely to broad stereotypes and fails to take account of an organization's or individual's unique profile.

There are two main methodologies available to help reduce bias:

Consequence scanning

Given that AI solutions are self-governed, it's vital to understand the consequences of any decisions, some of which can be negative and life touching. In an extreme case, facial recognition AI could identify the wrong person as the perpetrator of a crime. When designing AI features and products, XaaS companies should attempt to minimize any bias by considering intended and unintended consequences, focusing on specific positive consequences, and identifying specific consequences they want to mitigate.

Training developers on ethical principles and bias

AI bias can be caused by human prejudice during algorithm development and training. A 2019 US study found that an algorithm was less likely to refer black people than white people to programs for improving

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care. Developers should be trained to recognize their own and others' biases when building algorithms.

Data security, technology and organizational hurdles

Cyber security is a huge concern with organizations at risk 24/7. When using XaaS tools, it's essential to have an integrated platform that can swiftly identify security incidents and provide detailed analysis to mitigate the root cause. XaaS customers are faced with further challenges like regulatory and security compliance, disparate legacy systems, technological disruption and a lack of alignment between people and processes.

To address regulatory and security compliance, XaaS providers should focus on helping to improve operational efficiency and creating customer-centric, service-oriented strategies.

Democratization of platforms

Data democratization means making digital information easily accessible to all users, expanding the value of XaaS services to a larger audience. This can be achieved through microservice architecture, which positions applications as a collection of services that are highly maintained and tested, loosely coupled, independently deployable, organized around business capabilities, and owned by a small team.

Low code/no code platforms can accelerate digital transformation, enabling citizen developers to create, test and deploy new applications more easily.

Self-service/self-heal environments

Self-service is becoming the norm as customers increasingly expect a fast, simple experience, with easy access to information, questions, tutorial videos and live chat/bots. Organizations are turning to more 'natural' engagement methods such as voice and other AI-powered technologies, which can achieve higher operational efficiency and improved customer satisfaction.

AI enabled self-healing platforms are one of the latest innovations in artificial intelligence, with the potential to fix issues quickly and efficiently across systems without any human help, avoiding the need to escalate. They can identify and prioritize factors that may impact network performance; make accurate and timely predictions about outcomes to allow swift remedies; and give deeper insights and drive better decisions by correctly differentiating between casual and correlative factors.

The cost of outages

Outages are an inevitable fact of life in the technology age. Outages of even a minute can cost companies an equivalent amount of lost sales. Being able to reliably calculate the true cost of an outage helps companies put together a more complete business case for investing in cloud based XaaS services.

Adopting DevSecOps to create an integration and delivery pipeline

Continuous integration (CI) and continuous delivery (CD) enable application development teams to deliver code changes more frequently and reliably. And because these methodologies are agile and automated, developers are freed up to focus on business requirements, code quality and security.

In a trusted CI/CD pipeline every open-source project or module is known and tested for compatibility before being released. More and more companies are adopting a DevOps model, where development and operations merge into a single team, with engineers working together across the entire application lifecycle. Such an approach, known as DevSecOps, places a greater emphasis on security at all stages of development, which can help to avoid potentially devastating incidents.

DevOps can also be enhanced by AI-driven applications and ML, helping to determine where to focus on vulnerability management. Automation can be used for a range of activities, from building infrastructure for the XaaS platform to auditing security functions. As cloud usage goes mainstream, automation will likely increase and DevSecOps will likely merge with DevOps, ultimately evolving into NoOps, when no human intervention at all is required for operations. In this model, lines between development and operations teams become blurred with members of each group assuming each other's responsibilities.

Economic

Whether a business is ‘born in the cloud’ or migrating from traditional one-off licensing to an as-a-Service model, it should adapt to the economic uncertainties and operating model challenges of XaaS. Products should deliver long-term value, with rewards and incentives aligned with performance metrics. Organizations adopting subscription-based business models should also consider accounting and financial considerations, making appropriate changes to the balance sheet and income statement. All of which calls for a rethink of internal capabilities and management strategies to help ensure a smooth transition.

Operational considerations of migrating to cloud

Although advancements in cloud technologies have reduced implementation costs and technical barriers related to transitioning to XaaS, there remain significant challenges in adapting performance and operating metrics.

Changes or enhancements to product offerings

Companies offering a combination of software, hardware platforms, technology services and professional services should maintain profitability in the face of a range of vastly different cost structures. To do so, they need a product hierarchy and bundling process that simplifies revenue and margin estimates. Additionally, for both pure-play XaaS companies and those that sell hybrid products (combining on-premise and/or on-device software and XaaS elements),

Products should deliver **long-term value**, with rewards and incentives aligned with **performance metrics**.

adding new features and functionality can typically require a rethink over profitability. It's essential to clearly define a product offering as either pure cloud or hybrid, to understand the revenue recognition and cost accounting implications.

Changes to service and product offerings (e.g., moving from a license to as-a-service) can create new performance obligations — or change existing ones, which calls for processes and controls to identify and evaluate such shifts. XaaS providers should also understand related services, such as post-contract customer support for on-premise or on-device software offered within a hybrid model.

Compensation agreements

Compensation arrangements, including commission, bonus and shares, may have been designed around the company's licensing model. Operating as a XaaS provider may also change the evaluation of supply chain performance and channel partner rewards, with a shift towards nurturing long-term customer delight and relationships and away from short-term sales. Any changes to compensation should be made early in the transition process to avoid accounting issues and employee and channel partner dissatisfaction.

In a hybrid cloud model, there are separate software license elements where revenue is generally recognized at point-of-sale rather than over the subscription period. Even in pure cloud offerings, companies should consider the appropriate revenue recognition for implementation services and any variable, usage-based fees.

Adopting new metrics for the XaaS model

Transitioning to a SaaS business model will likely frequently require companies to re-evaluate their operating and performance metrics, with traditional, licensing-based measurements becoming less relevant. The subscription based XaaS model elevates the importance of evaluating customer experience, as customers' decisions to renew or cancel their services have a lasting impact on revenues.

Transitional growing pains are likely, as companies combine on-premise licensing with subscription-based SaaS products. During this changeover period, they should keep investors accurately informed about the balance between these two revenue sources, and how that impacts performance metrics.

At the same time, metrics (for sales team members and partners) and their compensation structure should focus on retention and expansion of customers.

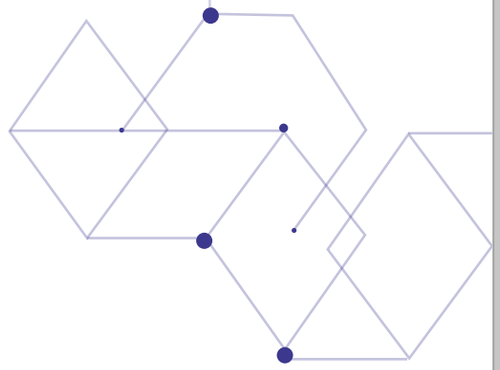
Major shift to asset-light, subscription-based models

The recent pandemic has prompted companies in all sectors to consider asset-light strategies to fuel growth and strengthen financial performance, leading to improved shareholder returns and higher valuations.

An asset-light model involves transferring capabilities, such as people, process and technology, to third-party owners in order to transition from fixed to variable cost structures, enhance agility and shift resources to focus on core capabilities.

A subscription-based model, with lower set-up and implementation costs, is an attractive operational and investment option for organizations considering shifting to remote or hybrid workforces. Today's customer needs are volatile and influenced heavily by convenience, requiring companies to constantly upgrade and refine products and services. XaaS offers the speed and flexibility to adapt to fast-changing markets, as value is not tied to physical asset ownership.

> XaaS providers should also understand related services, such as post-contract customer support for on-premise or on-device software offered within a hybrid model.



Business models

Proliferation of the XaaS model

Everything-as-a-Service **(XaaS)** is **evolving at pace**, as customers look to adopt **cloud enabled technologies** across a wide range of services.

‘Everything-as-a-Service’ (XaaS) is evolving at pace, as customers look to adopt cloud-enabled technologies across a wide range of services. Our research shows that customers are eager for models that support the following goals:

- **Organization-wide cost reduction**
- **Transitioning on-premise software and hardware from significant capital expenditure to operating expense**
- **Business agility, ease and scalability**
- **Version-less, many-to-many collaboration**
- **More innovation, with advanced development tools and add-on marketplaces**
- **Focus on outcomes and outcome-based pricing**

Initial core XaaS offerings included software (SaaS), platform (PaaS) and infrastructure (IaaS). However, the growing commoditization of business services, supported by technological advances, has accelerated the development of XaaS, leading to new 'as-a-service' models, as shown in the chart below highlights:

XaaS Offering	Description
Software-as-a-Service (SaaS)	— Users can access software and licensing online via subscription — Companies don't have to develop software from scratch
Platform-as-a-Service (PaaS)	— Provider hosts cloud computing platform accessed online, enabling users to develop, utilize and maintain applications, software, and other engineering projects — Users can build products on the cloud-hosted platform, rather than buying/storing hardware
Infrastructure-as-a-Service (IaaS)	— Provider hosts IT infrastructure such as storage, server and networking resources, delivered to users on-demand via virtual machines accessed online — Enables users to scale IT resources up and down in line with demand, and limits need for on-premise hardware
Analytics-as-a-Service (AaaS)	— Provider provisions analytics software and operations to users through cloud-delivered technologies — Enables users to track key business metrics and gain on-demand insights
Desktop-as-a-Service (DaaS)	— Provider hosts virtual desktop infrastructure, allowing users to log into their company's virtual desktop — Lets employees access servers, files and software from anywhere

XaaS Offering	Description
Functions-as-a-Service (FaaS)	— Provider hosts cloud platform in which users can develop, use and maintain application functionalities online, and leverage specific functions or outcomes without having to develop/run on-premise — Allows users to build apps and code with action sequences in response to events
Storage-as-a-Service (STaaS)	— Provider hosts digital storage space where users can offload data onto a third-party, cloud-hosted infrastructure — Enables data transfers and frees up additional on-premise storage space
Containers-as-a-Service CaaS)	— Provider offers 'containers' to store and package software code — Users can store code libraries without having to build a container
Database-as-a-Service (DBaaS)	— Users can create a personalized database in the cloud, to organize, filter and store customer data — Users no longer need to develop their own databases
Authentication-as-a-Service (AUaaS)	— Users gain control over access to information across devices and networks, gaining greater governance
Blockchain-as-a-Service (BaaS)	— Users can build, use and maintain their own blockchain apps, contracts and functions on the blockchain infrastructure developed by the provider — Frees up resources that would otherwise be developing in-house blockchain

XaaS Offering	Description
Device-as-a-Service (DVaaS)	— Users access mobile computing devices (laptops, desktops, smartphones) through subscription-based service — Users able to outsource device management and more easily upgrade to new technologies
Network-as-a-Service (NaaS)	— Providers deliver networking infrastructure and connectivity to users through the cloud — Companies can develop and use their networks without physical hardware onsite, as well as tailor networks to meet their own security needs
Automation-as-a-Service (AMaaS)	— Users access cloud-based RPA services to fulfill automation solutions — Helps organizations implement scalable automation projects and test use cases for automation opportunities
Data Integration-as-a-Service (DIaaS)	— Provider delivers connectivity to systems, files and apps through an integration solution hosted over the cloud — Avoids need to manage and upgrade integration hardware on-premises

How the business model is evolving

Today's XaaS customers want greater choice over what they buy, how they pay, and when and where they use products and services. Above all they seek flexibility to change their purchases and scale up and down, at short notice, to suit their business ambitions. Consequently, traditional models of SaaS, IaaS and PaaS are evolving and expanding, driven by new technology platforms.

When considering the appropriate operating model and pricing strategy to deliver XaaS, providers should understand evolving consumer demands and market conditions in order to enhance revenue. This means determining products and bundles, customer segments and specific needs, channels to market (including partners and incentives), and multiple subscription and consumption-based revenue models.

Traditional business models

Key dimensions / Revenue model	Perpetual licensing	Term licensing	Subscription	Consumption	Outcome/ value-based	Professional services	Freemium	Ecosystem	Marketplaces
Ownership/ right to use	Perpetual	Limited time	Limited time	Limited time and usage	Limited time and service	Limited time and service	Limited time	Limited time	Time and membership limited
Payment	Up-front	Up-front or ratable	Ratable/hybrid	Variable (usage)/tiered pricing	Variable (value delivered)	Variable (time and materials)	0 upfront/ variable (usage)	Ratable	Upfront or ratable
Payment timing	Up-front or custom	Periodic	Periodic	Periodic by consumption	Periodic by value/royalty	On delivery	None up front	Upfront and periodic	Upfront and periodic
Unit	Per license or per seat	Per license or per seat	Per subscriber	Per usage	Per business metric	Per project on time and materials	Per license or seat or subscriber	Per license or subscription	Per download

Traditional revenue models

Perpetual licensing	— Device-as-a-Service
Term licensing	— Desktop-as-a-Service — Storage-as-a-Service — Containers-as-a-Service — Database-as-a-Service — Device-as-a-Service — Automation-as-a-Service — Data Integration-as-a-Service

Evolving revenue models

Subscription	— Functions-as-a-Service — Blockchains-as-a-Service
Consumption	— Platform-as-a-Service — Authentication-as-a-Service
Outcome/value based	— Analytics-as-a-Service — Network-as-a-Service
Professional services	— Automation-as-a-Service — Data integration-as-a-Service
Freemium	— Desktop-as-a-Service — Database-as-a-Service
Marketplace	— Software-as-a-Service — Infrastructure-as-a-Service
Ecosystem	— Storage-as-a-Service — Container-as-a-Service

The above tables are illustrative examples of companies that leverage the various revenue models

XaaS transition challenges

Offering a variety of software, communications tools and applications on an as-a-Service, subscription basis, calls for a highly customer-centric organization, with every part of the business aligned around the customer experience. Hurdles to overcome include outmoded, manual data entry and analysis, legacy, unintegrated technology, poor governance and controls, and a highly decentralized structure with a lack of shared services.

High degree of variability in pricing, go-to-market, and customer experience strategies

Target Operating Model Layers

Functional process
Manual data entry, and ad-hoc processes designed to fit a legacy on-premise strategy

Enabling technology
Legacy technologies and environments are not well integrated and have multiple process paths

Performance insights and data
Master data management issues including SKU breakout/explosion, pricing and a single view of the customer

Governance/controls
Controls that are reactive to risk and an over-reliance on manual detective controls

People and organization
Lack of communication from the top-down strategy and organizational buy-in to an overarching change management strategy

Service delivery model
Decentralized and autonomous business functional groups with a lack of shared services

Misalignment between the reporting strategies and existing technology stack, inhibiting meaningful business intelligence

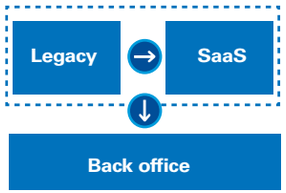
Building a XaaS-first business

We observe **three broad approaches** in the transformation to XaaS, depending upon the organization's unique cultural, technological and structural status and maturity: **evolution/adaptation, revolution/disruption and composable/modular**.

Evolution/adaptation

The organization adapts its operating model and capabilities to shift from legacy products and services.

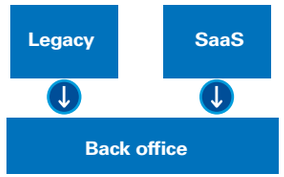
This approach builds upon existing processes, technology and people but can be held back by complexity, resistance to change and reduced agility.



Revolution/disruption

Developing a completely new operating model and capabilities.

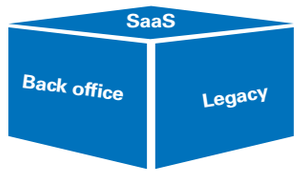
This requires additional investment but provides a clean slate to build an agile, XaaS-first organization.



Composable/modular

Deconstructing the operating model into modular building blocks.

Rearchitecting the business into pieces that can be assembled and connected with flexibility and agility.



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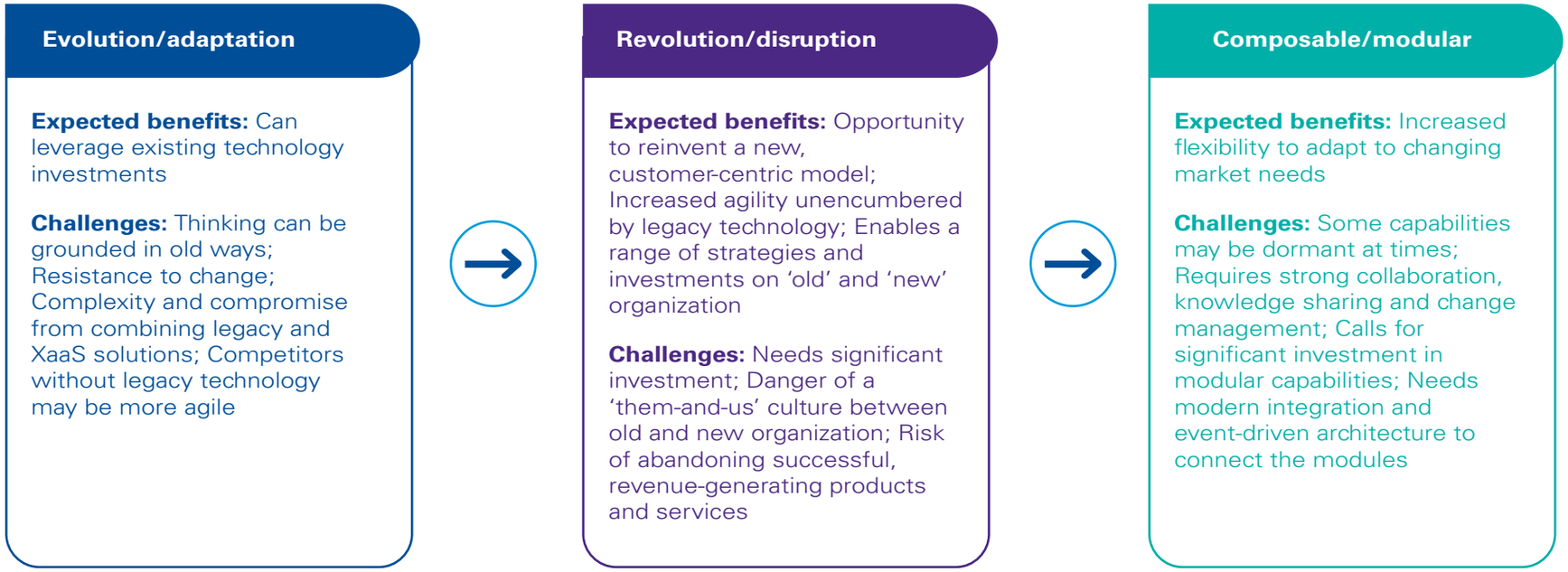


Reimagining the operating model: The XaaS 'iceberg'

As companies with traditional business models rapidly launch cloud-based products and XaaS offerings, they should rethink strategy, culture, engineering, customer experience, go-to-market and operations. Such a transformation is immensely complex, depicted by the following 'iceberg' diagram, showing how many of the challenges are not immediately visible to leadership.

The XaaS transformation iceberg

Strategy
Maintaining continuous competitive differentiation vis-à-vis born SaaS nimble and newer competitors

Culture
Rallying around a culture of continuous innovation, rapid collaboration, and individual and group purpose.

Engineering
Balance throughput, quality, stability and customer satisfaction to build cross-product synergies in a software platform

Customer experience
Relentless focus on compelling experiences and self-service across the broad acquire-to-renewal lifecycle

Go-to-market
Capitalizing on a partner-driven sales model with compelling product offerings priced to capture the complete addressable market

Operations
Data-driven, cost-efficient business, automated KPIs and intelligent telemetry across products and solutions

XaaS and the connected enterprise

What does a flexible, robust XaaS platform look like?

XaaS is all about giving customers flexibility, so they can adapt to fast-changing demands unencumbered by long-term, fixed-price contracts, or software and hardware that can quickly become obsolescent. A connected enterprise gives XaaS providers the power to create such customer-centricity, focusing every critical process, function and relationship of a business on meeting customer expectations.

Being connected helps companies embrace new business/revenue models and routes to market, scale up (or down) rapidly, and via a modular operating model with a configurable architecture.

Platform companies continue to rapidly evolve and disrupt existing revenue models as they seek to gain customers and increase market share

Agility to embrace new business models

- Enable continuous monetization
- Network effect customer and data centric

Rapid scalability

- Scale from small trials to complex
- Support transactional level traceability

Scale client service and support

- Master agreement support for enterprise billing
- Self-service with single view of contracts, entitlements and allowances

Adapt to embrace new revenue models

- Prepaid and postpaid business models
- Multi-sided business model integration
- Simple, flexible pricing and bundling design

360° management of recurring/usage-based revenue streams

- Automated multi-channel payment
- Personalized support for invoice inquiries
- Partner revenue sharing

In this chapter, we will explore how a KPMG Connected Enterprise model can help XaaS organizations build a scalable environment.

A successful operating model is built upon eight connected capabilities

In a recent survey, conducted by Forrester Consulting on behalf of KPMG, two-thirds (67 percent) of XaaS organizations say they're investing in at least six customer-centric capabilities.* The study found that high-maturity XaaS providers demonstrate better execution of a holistic customer-centric enterprise strategy — one that spans multiple capabilities — than low-maturity organizations.**

* Base: 355 professionals involved with customer-centric strategy decisions at organizations providing cloud services

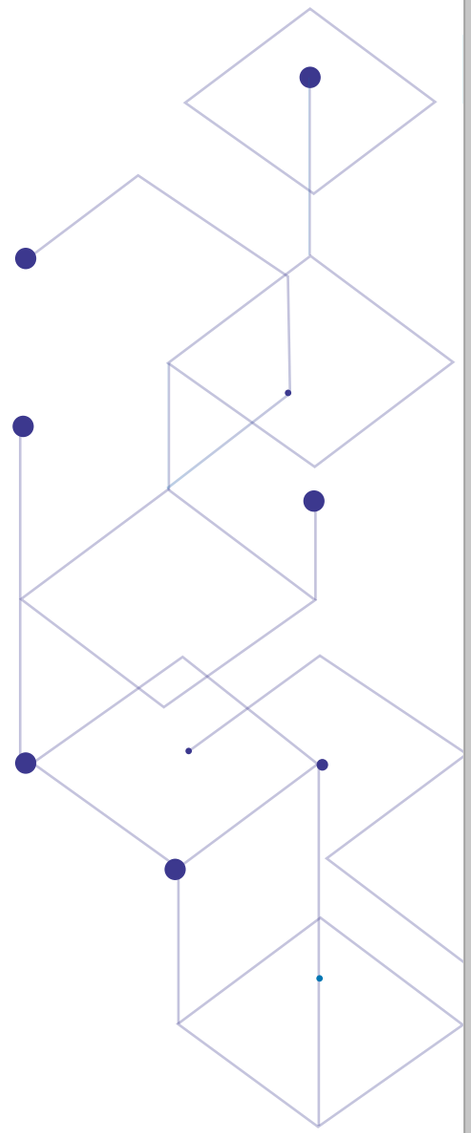
** Base: 173 professionals involved with customer-centric strategy decisions at high-maturity and low-maturity organizations providing cloud services

Source: A commissioned study conducted by Forrester Consulting on behalf of KPMG, April 2021

The eight capabilities of KPMG Connected Enterprise:

Insight-driven strategies and actions	01	Harness data, advanced analytics and actionable insights with a real-time understanding of the customer and the business to shape integrated business decisions.
Innovative products and services	02	Develop compelling customer value propositions on price, products and services to engage the most attractive customers and drive profitable growth.
Experience centricity by design	03	Design seamless, intentional experiences for customers, employees and partners, supporting the customer value propositions and delivering business objectives.
Seamless interactions and commerce	04	Interact and transact with customers and prospects across marketing, sales and service and achieve measurable results.
Responsive operations and supply chain	05	Operate the business with efficiency and agility to fulfill the customer promise in a consistent and profitable way.
Aligned and empowered workforce	06	Build a customer-centric organization and culture that inspires people to deliver on the customer promise and drive up business performance.
Digitally enabled technology architecture	07	Create intelligent and agile services, technologies and platforms, enabling the customer agenda with solutions that are secure, scalable and cost-effective.
Integrated partner and alliance ecosystem	08	Engage, integrate and manage third-parties to increase speed-to-market, reduce costs, mitigate risk and close capability gaps to deliver the customer promise.

In building an effective XaaS business, based around customer experience, providers may be held back by poor product or business processes, which can slow down delivery of services and push up costs, failing to fulfil customer expectations. The composable model uses the connected enterprise framework to deliver a robust, configurable XaaS operating model.



Investment in key digital capabilities helps drive better performance

Compared with their less-mature peers, high-maturity XaaS providers are more likely to successfully:

Base: 173 professionals involved with customer-centric strategy decisions at high-maturity and low-maturity organizations providing cloud services
Source: A commissioned study conducted by Forrester Consulting on behalf of KPMG, April 2021

Case studies

1

Helping partners transition to subscription payments

A global enterprise software company was transforming to a subscription-based model and needed help to review its partners, who were responsible for 80 percent of revenues.

KPMG in the US helped to assess baseline performance and capabilities of existing partners, refine the partner program, metrics, and incentives, and accelerate subscription revenue growth of priority partners.

This enabled the client to hit sales targets, improve partners' quality of service to end customers, and ensure consistent and appropriately incentivized partner management.

2

Making life easier for customers and partners

A cyber security company has grown quickly over the recent years through acquisition. Although revenue has risen, leadership found that internal processes and systems were holding back the ability to make fast and insightful decisions and help reduce fixed costs.

KPMG in the US performed a rapid assessment of the operating model and helped implement a number of quote-to-cash (quoting, contracting and ordering) solutions to streamline the front, middle and back office. Customers and partners now find it easier and swifter to do business, which enhances the overall experience.

3

Driving cloud metrics reporting at a networking company

A major multinational networking company, whose revenue came primarily from hardware, was transforming into an integrated solution, SaaS, cloud, subscription-based provider.

KPMG in the US has been helping the client to achieve its ambition, by defining strategic finance opportunities and developing its business intelligence capability. They also worked with the company to help improve financial reporting metrics, tools, dashboards and forecasting, which is enabling the new business model and bringing greater revenue and cost transparency.

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KPMG Connected Enterprise for XaaS is an insight-led, customer centric approach to digital transformation.

In KPMG professionals' experience, there are a number of key considerations that can help XaaS companies make faster progress on the connected journey:

1. **Keep close to what your customers want.** The ability to think, outside in, is key in building a customer-centric business. Strive to ensure you know and act on what your customers want, need and value; keep continually looking up and outside of the organization and industry to help ensure alignment with the best customer experiences in day-to-day life.
2. **Do things in an agile way.** Break changes down into specific steps, sequence them and implement. Keep standing back to assess whether the change has been successful in a 'test and learn' approach. It's about a series of small changes that together add up to a significant and impactful transformation.
3. **Build in resilience.** Take on today's challenges with resilience and determination, and be prepared to expect the unexpected, fail fast and learn along the way. By developing a connected enterprise architecture, you can find your ability to change course at speed is significantly enhanced.
4. **Keep it human.** While embedding new technologies such as AI and automation are likely to be critical in developing more seamless interactions for customers, remember that you also need to keep the experience 'real.' Great organizations remain defined by the quality and passion of its people and its sense of purpose.
5. **Make use of new technologies.** Continually look at what new technologies are becoming available that could help you serve customers better or connect your business. Experiment with the opportunities enabled/available through cloud, machine learning and advances in data science.

KPMG firms help XaaS providers to evaluate and improve all eight connected capabilities across the enterprise. These capabilities align with the operating model and allow companies to prioritize, shape and execute their digital transformation.

KPMG professionals' experience of working in digital transformation has informed a set of transformation accelerators, including a range of configurable SaaS solutions from leading technology providers.

Five key questions for XaaS providers:

1. Are you connecting customers with compelling value propositions, opportunities and interactions?
2. Are you connecting and empowering your employees to deliver on the customer promise?
3. Are you connecting your front, middle and back offices to execute the customer growth agenda?
4. Are you connecting your ecosystem of business partners to jointly deliver on commitments to customers?
5. Are you connecting to market dynamics and digital signals?

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Contributors

The following team was instrumental in the development of this point of view:

Project Sponsorship

Alex Holt
Global Head of Technology, Media & Telecoms, KPMG International

Connected Enterprise Global TMT Lead

Peter Mercieca
Consulting Industry Leader, Technology, KPMG in the US

XaaS Global Business Architect

Vijay Subramanyam
Principal, Transformation Delivery, KPMG in the US

Global TMT Board Members

Audit — Jana Barsten, Partner, Audit, KPMG in the US

Australia — Levi Watters, Partner, KPMG in Australia

Canada — Anuj Madan, Partner, KPMG in Canada

China — Daniel Chan, Partner, KPMG in China

EMA COE — Mritunjay Kapur, Executive Director, Head of Advisory, KPMG in South Africa

France — Jacques Pierre, Partner, Audit, KPMG in France

Germany — Markus Kreher, Partner, Audit — Finance & Governance Advisory, KPMG in Germany

Ireland — Anna Scally, Partner, KPMG in Ireland

Japan — Keita Yamane, Partner, KPMG in Japan

Singapore — Darren Yong, Executive Director, KPMG in Asia Pacific

Tax — Komal Dhall, Principal, Tax, KPMG in the US

UK — Ian West, Partner, KPMG in the UK

US — Mark Gibson, Partner, Growth & Strategy, KPMG in the US

Contributors

Achinta Khairom
Principal, Advisory, KPMG in the US

Aditya Rath
Partner, KPMG in India

Amardeep Chohan
Director, Advisory, KPMG in the US

Amitabh Chhibber
Director, Advisory, KPMG in the US

Amy Carpenter
Associate Director, KPMG in the US

Anand Sekhar
Managing Director, Advisory, KPMG in the US

Anish Mitra
Associate Director, KPMG in India

Anuranga Dehideniya
Manager, KPMG in Singapore

Bekki Leu
Director, Advisory, KPMG in the US

Devika Deshpande
Associate Director, KPMG in India

Gary Plotkin
Principal, Advisory, KPMG in the US

Gavin Bartlett
Director, Consulting, KPMG in the US

Harman Guron
Manager, Advisory, KPMG in the US

Harry DeRecat
Associate, Advisory, KPMG in the US

Himanshu Mishra
Managing Director, Advisory, KPMG in the US

James Murphy
Principal, Advisory, KPMG in the US

Jessica Odermatt
Senior Associate, Advisory KPMG in the US

K G Purushothaman
Partner, KPMG in India

Konrads Klints
Director, KPMG in Singapore

Kunal Chande
Director, Advisory, KPMG in the US

Malika Adam
Manager, KPMG US Foundation, KPMG in the US

Mansi Joshi
Sector Executive, Asia Pacific KPMG in Australia

Marina Odai
Manager, KPMG in the UK

Mark Levy
Managing Director, Advisory KPMG in the US

Matt Loong
Associate Director, KPMG in Singapore

Matthew Antosy
Director, Advisory, KPMG in the US

Namrata Mehta
Director, KPMG in India

Nikkhil Gill
Managing Director, Advisory, KPMG in the US

Pär Edin, Principal
Advisory, KPMG in the US

Philip Wong
Principal, Advisory, KPMG in the US

Prashant Talwar
Director, Advisory, KPMG in the US

Raman Gilotra
Director, Advisory, KPMG in the US

Richard Hanley
Principal, Advisory, KPMG in the US

Sabrina Zhu
Senior Associate, Advisory, KPMG in the US

Saloni Singhal
Associate Director, KPMG in India

Shahnawaz Alware
Director, Advisory, KPMG in the US

Sony Anthony
Partner, KPMG in India

Sunil Seth
Director, KPMG in India

Suraj Shridhar
Consultant, KPMG in India

Urvashi Roe
Global Director, Sales Enablement, Connected Enterprise, KPMG International

Vivek Sudhakar
Managing Director, Advisory, KPMG in the US

Whitney Keller
Director, Advisory, KPMG in the US

Contacts

Alex Holt
Global Head of Technology,
Media & Telecom,
KPMG International
E: alexanderholt@kpmg.com

Peter Mercieca
Consulting Industry Leader,
Technology,
KPMG in the US
E: pmercieca1@kpmg.com

Vijay Subramanyam
Principal,
Transformation Delivery,
KPMG in the US
E: vijaysubramanyam@kpmg.com

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