The Future of Cloud in Asia Pacific

The intricacies of the cloud adoption journey and market

August 2021

Contents

Introduction

Cloud technology is playing an even more integral role in the world economy. During the COVID-19 pandemic it has underpinned global supply chains and remote working and it will continue to be an essential asset for organizations in Asia Pacific looking for increased scalability, business continuity and cost efficiency in 2021 and beyond.

Across the region, our customers are increasingly turning to cloud innovations as the basis of their digitalization efforts, in a strategic move to drive real business value and resiliency against the backdrop of a highly dynamic operating environment and distributed workforce. This whitepaper provides an overview on public, private and hybrid cloud adoption by businesses across Asia Pacific by considering their needs, the

benefits sought, and more importantly, the risks encountered on this journey.

Through a mix of market analysis, customer research, and operational experience, Cisco, in partnership with Boston Consulting Group ("BCG"), is pleased to present the findings of our study. The team focused on Australia and New Zealand (ANZ), India, and key ASEAN markets such as, Indonesia, Malaysia, Singapore, and Thailand, but the findings apply to all markets in Asia Pacific.

This whitepaper explores the key market trends and imperatives for businesses to capture the hybrid multi-cloud market and how technology companies such as Cisco can partner with organizations as they move to a hybrid multi-cloud reality.

Research methodology

The research was conducted between December 2020 and February 2021 and includes a qualitative led research methodology, interviewing a mix of partners, customers, industry experts and the relevant Cisco and BCG leads.

The team analyzed more than 10 market reports and eight BCG client experiences and this analysis was validated against Cisco's findings. All of the research and findings were then cross-checked and validated against Cisco's own customer experience database.

Foreword

The future is in the cloud.

As organizations recognize and place greater value on the cloud, it is clear that cloud is here to stay and will be an increasingly integral part their strategy. The demand and adoption of cloud in Asia Pacific is forecast to exceed the rest of the world, with overall cloud spending expected to reach USD200 billion in the region by 2024, according to Gartner, as the effects of COVID-19 linger and businesses look to lay a foundation for increased agility and resilience.

For our new report titled, 'The Future of Cloud', we analyzed cloud usage trends among some 20 Cisco and BCG customers and partners regionally. We examined the needs of different organizations in the region, and drew insights on the benefits, challenges, and risks of different cloud adoption strategies. The report draws on real customer experiences to provide an accessible and digestible overview of the adoption of public, private and hybrid cloud in Asia Pacific.

As organizations continue on their cloud journey, it is important to note that there is no singular, pre-defined route for them. Every organization starts from a different base, with a different set of requirements, resources, and objectives based on its size, industry, location and other features, and they often take different turns to achieve their set outcomes.

Our study highlights that there is no one size fits all experience for implementing the cloud, but there are common trends and challenges which can be identified and summarized, especially in the Asia Pacific region. Today, cloud service providers argue that the cloud is the end in itself, but what is missing from their narrative is how each organization's journey is different and unique. This perspective has been encouraged by cloud service providers, but our experience shows the reality is not so simple. If business and IT leaders are going to make the right choices for their customers and end-users, they must be mindful in how they navigate the cloudification choices in front of them.

Our findings reveal companies are continuously optimizing their mix of public and private cloud environments, but their challenge is how they ensure this shift to cloud technologies is managed efficiently and securely, and in a way appropriate for their business, especially with a distributed workforce at play. Senior technology leaders should be wary of seeing their entire business through a one size fits all lens. It's highly likely that some business functions within the organization will be at different stages of their cloud journey. Many also now face the challenge of how to deliver shared context across teams in a way that enables them to deliver exceptional digital experiences, optimized for cost, security and performance so that they can maximize digital business revenue.

I want to take this opportunity to thank our customers and partners for giving us their valuable time to contribute to this research. We hope you enjoy reading the high-level insights and that this report helps you to define a strategy that takes advantage of public cloud offerings, private cloud services, and traditional on-premise solutions that best suit your transition to the cloud.

Naveen Menon
President, ASEAN,
Cisco

Prasanna Santhanam
Managing Director and Partner, Singapore,
Boston Consulting Group

Key takeaways

1 **Shift to cloud is a challenge, but delivers real business value**

Cloud and the challenge of cloud adoption is a critical issue that all major organizations are seeking to navigate. It is important to understand that cloud is both a technology and a business transformation strategy. Our research has found there is a strong shift underway towards cloud technologies, with business leaders across Asia Pacific understanding and embracing the benefits of cloud and using it to drive business change and to deliver value. Cloudification delivers real business value, enabling organizations to be faster, leaner and better at delivering for their customers.

2 **One size does not fit all**

There is no singular, pre-defined cloud journey route. Every organization starts from a different base, with a different set of requirements, resources, and objectives based on their size, industry, location and other features, and they often take different routes to achieve their objectives. It is critical to acknowledge the unique challenges and opportunities presented by your circumstances – and then be flexible to adapt to the changing customer and regulatory environment, whether that means increasing your public cloud investments, or repatriating workloads and technologies to your own assets and infrastructure.

3 **Five key cloud adoption organization archetypes identified**

The study allowed us to categorize organizations into five primary archetypes. These groupings are based on their cloud adoption stage and cloud technology choices, as well as their operational and commercial imperatives for cloudification. These five organization archetypes are: **Digital Natives**; **Cloud Optimizers**; **Cloud Pragmatists**; **Cautious Adopters** and **Cloud Onlookers**. It will be critical for your organization to determine your own archetype as this will form the basis for your cloud strategy.

4 **Cloud adoption has four distinct stages**

While there is a definite shift towards cloud technologies, organizations are at different stages of their cloud adoption journey. We have identified four distinct stages of cloud adoption, with organizations leveraging a mix of public and private cloud technologies as they seek to balance agility and innovation with variable cost structures. These four stages are: **Initial or Ad-hoc**, **Experiment**, **Scale**, and **Operate@Scale**. Understanding which stage your organization is at is crucial in enabling you to define a strategy that fits your circumstances.

5 **Enterprises will drive the cloud agenda of the future**

It is abundantly clear that cloud is here to stay. However, while cloud service providers have in the past positioned cloud itself as an end-goal for organizations, it is apparent the next chapter of the cloud story will be defined by the users themselves. As cloud plays an increasingly integral role in an organization's digital strategy, business and IT leaders are proactively developing cloudification strategies that prioritize their business goals and needs – and in doing so, having a greater voice in the cloud narrative and agenda.
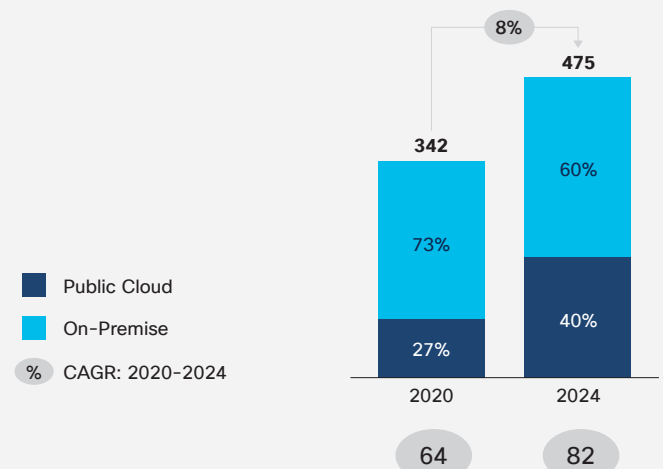
Rapid growth in cloud market

Cloud market today

There is a strong shift towards cloud technologies in Asia Pacific. Overall cloud spending is expected to reach USD200 billion in the region by 2024, with investment into cloud growing at a compound annual growth rate (CAGR) of over 20% since 2018. Cloudification is happening with public as well as private cloud and is both a technology and a business transformation strategy. This trend is expected to continue, with a strong shift towards cloud across all layers of the technology stack.

Across the markets our research has focused on, strong double-digit growth rates are forecast in the hardware categories that drive private and hybrid cloud deployments. ANZ, India and Singapore are the largest markets for IT spend and are expected to drive over USD50 billion of cloud spend by 2024. In Australia for example, it is expected that 50% of total IT spending will be on public cloud services by 2024.

Steady increase in cloud spend as part of APJC IT spend

Overall IT Spend across Applications, Platforms, Infrastructure and Services

8%

342

475

2020
- On-Premise: 73%
- Public Cloud: 27%

2024
- On-Premise: 60%
- Public Cloud: 40%

■ Public Cloud
■ On-Premise
% CAGR: 2020-2024

64   82

Total IT spending by key countries in APJC in 2024 (US$B)[1]

Legend:
- Public Cloud (dark blue)
- On-Premise (light blue)
- % CAGR: 2020-2024

Chart — Total IT spending by key countries in APJC in 2024 (US$B):

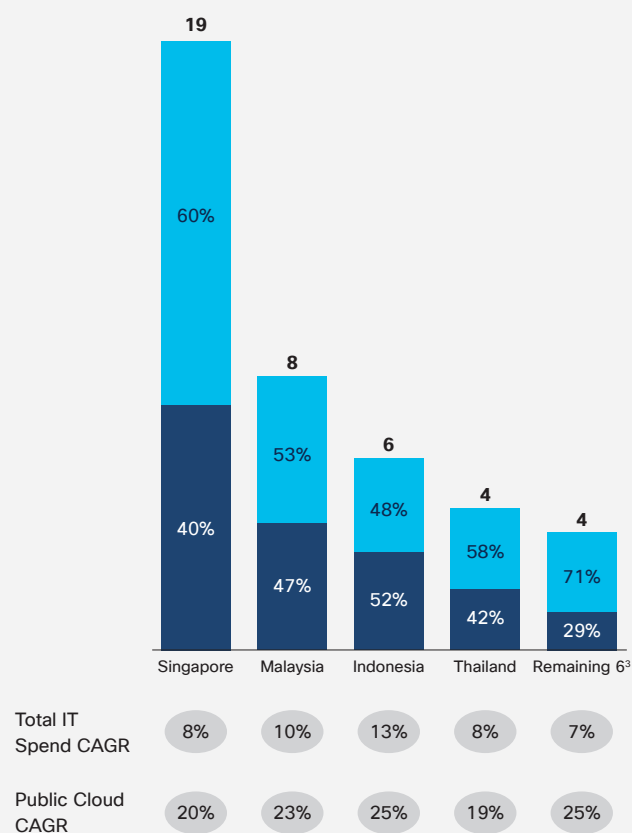| Country	Total	On-Premise %	Public Cloud %
ANZ	57	51%	49%
India	37	62%	38%
Singapore	19	60%	40%
Malaysia	8	53%	47%
Indonesia	6	48%	52%
Thailand	4	58%	42%

	ANZ	India	Singapore	Malaysia	Indonesia	Thailand
Total IT Spend CAGR	8%	12%	8%	10%	13%	8%
Public Cloud CAGR	17%	26%	20%	23%	25%	19%

[1] Excludes Business Consulting, BPO, Client Device Support, Service Desk Managed Services, Managed Workplace Services and Application Managed Services. Breakdown of remaining 75% of overall IT spend in APJC in US$B in 2024: 155 – Japan, 141 – China, 23 – South Korea, 10 – HK, 7 – Taiwan, 7 – Rest of Emerging Asia Pacific. Source: Gartner

Total IT spending by key countries in ASEAN in 2024 (US$B)[2]

Chart — Total IT spending by key countries in ASEAN in 2024 (US$B):

Country	Total	On-Premise %	Public Cloud %
Singapore	19	60%	40%
Malaysia	8	53%	47%
Indonesia	6	48%	52%
Thailand	4	58%	42%
Remaining 6[3]	4	71%	29%

|	Singapore	Malaysia	Indonesia	Thailand	Remaining 6[3]
Total IT Spend CAGR	8%	10%	13%	8%	7%
Public Cloud CAGR	20%	23%	25%	19%	25%

[2] Excludes Business Consulting, BPO, Client Device Support, Service Desk Managed Services, Managed Workplace Services and Application Managed Services.
[3] Includes Brunei, Cambodia, Laos, the Philippines, Myanmar and Vietnam. Source: Gartner

India, Indonesia and Malaysia are key markets where cloud spend is expected to grow at a much faster rate, with a CAGR of 25%; this is quicker than the forecast in developed economies such as ANZ and Singapore.

Growth will be relatively slower in the more developed markets, although they are still expected to grow at 17% and 20% in ANZ and Singapore respectively. India, Indonesia and Malaysia will lead the pack in terms of growth of overall IT spend and investment into public and private cloud services.
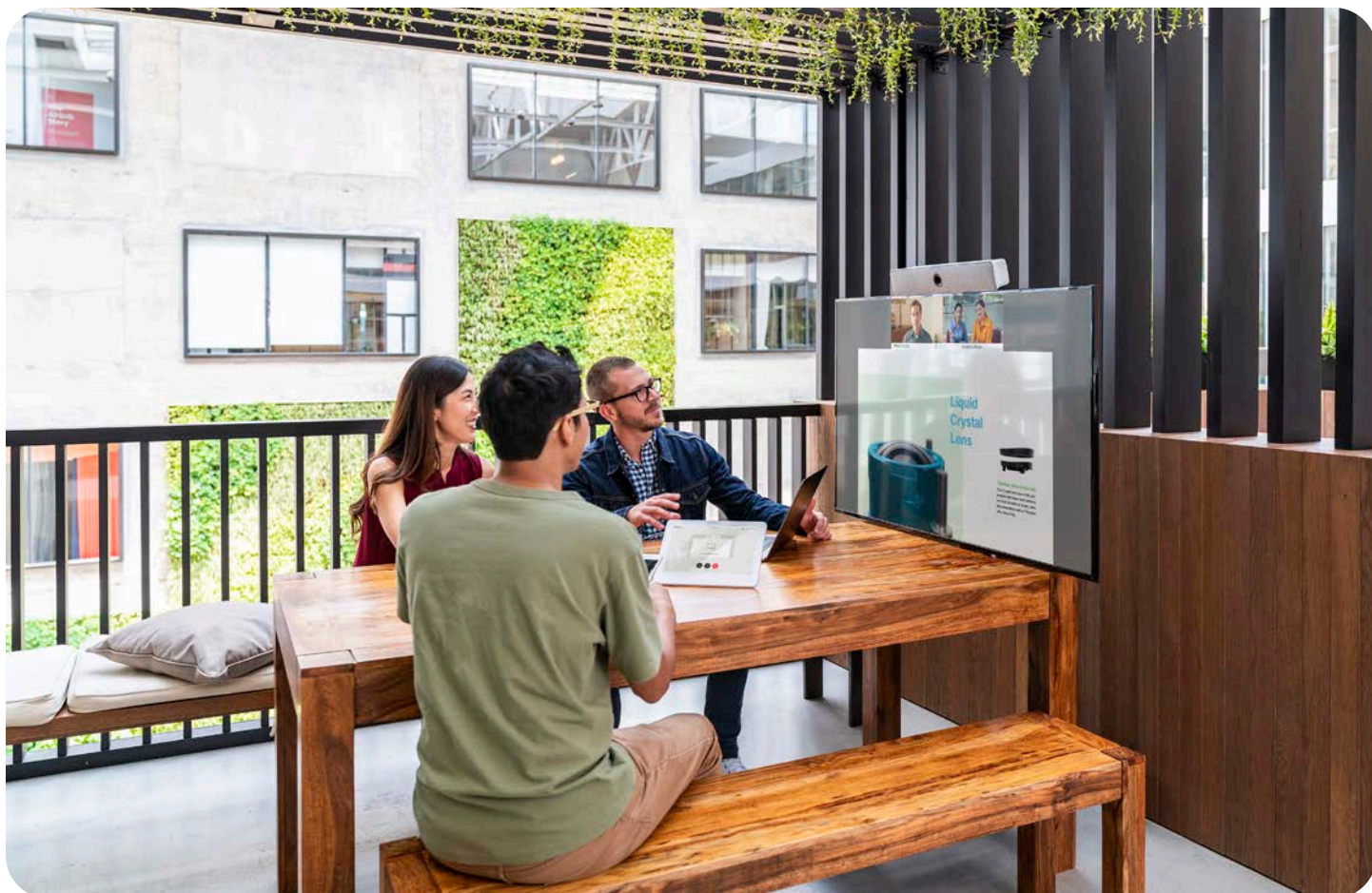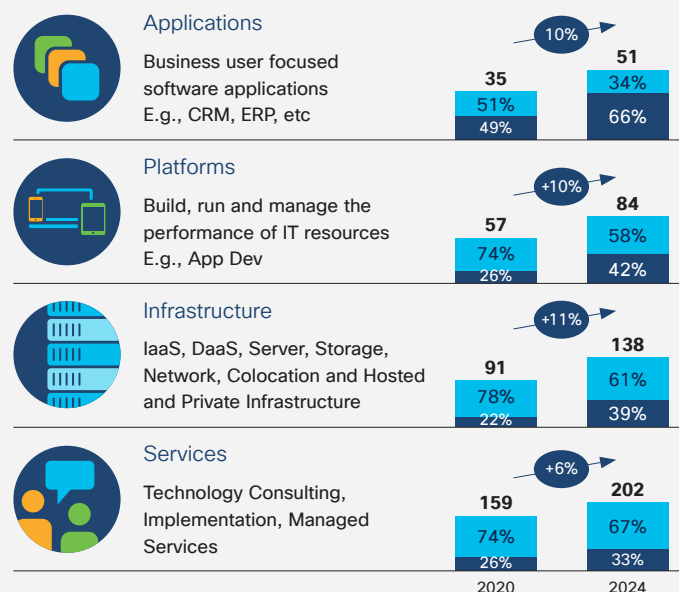
While companies are at different adoption stages, there is a clear priority to embrace public and private cloud environments. Overall IT spend is shifting towards cloud-related services across all layers of the technology stack, as cloudification delivers real value to companies, which will be discussed in the next chapter. There is a steady increase in the percentage of IT spend that is devoted to the cloud.

Shift to cloud happening across all layers of tech stack[4]

Applications
Business user focused software applications E.g., CRM, ERP, etc

35 → 10% → 51
51% / 49%   34% / 66%

Platforms
Build, run and manage the performance of IT resources E.g., App Dev

57 → +10% → 84
74% / 26%   58% / 42%

Infrastructure
IaaS, DaaS, Server, Storage, Network, Colocation and Hosted and Private Infrastructure

91 → +11% → 138
78% / 22%   61% / 39%

Services
Technology Consulting, Implementation, Managed Services

159 → +6% → 202
74% / 26%   67% / 33%

2020   2024

[4] Excludes Business Consulting, BPO, Client Device Support, Service Desk Managed Services, Managed Workplace Services and Application Managed Services. Source: Gartner

Sources:
1. Forecast: Public Cloud Services, Worldwide, 2018-2024, 3Q20 Update (Gartner)
2. Forecast: Cloud Consulting and Implementation Initiatives by Macro-Region and Size of Company (Millions of Constant U.S. Dollars) (Gartner)
3. Forecast: Enterprise Application Software, Worldwide, 2018-2024, April 2020 Update (Gartner)
4. Forecast: Enterprise Infrastructure Software, Worldwide, 2018-2024, April 2020 Update (Gartner)
5. Forecast: External Storage Systems, Worldwide, 2018-2024, April 2020 Update (Gartner)
6. Forecast: Enterprise Network Equipment, Worldwide, 2017-2024, April 2020 Update (Gartner)
7. Forecast: Servers, All Countries, 2018-2024, April 2020 Update (Gartner)
8. Forecast: IT Services, Worldwide, 2018-2024, 2Q20 Update (Gartner)
9. Forecast: Information Security and Risk Management, Worldwide, 2018-2024, 4Q20 Update (Gartner)
10. Market Share All Software Markets, Worldwide, 2019, Apr 2020 (Gartner)

Organizations embracing cloudified offerings in APAC

Cloud is the future, delivering improved outcomes for companies and governments; this view is now widely accepted by leadership teams, across different sectors and territories. Cloudification delivers real business value for these organizations, as cloud technologies enable companies to be faster, leaner and better. Business leaders in the region understand this and see cloud as the foundation for digitalization. Their organizations, particularly large enterprises, are looking for cloudification solutions beyond public cloud offerings due to a complex set of requirements and context. There are a range of reasons for this, including data rules, security, financial costs and flexibility.

Many organizations are turning to cloud technology as it can deliver direct commercial and operational gains, which feeds into realizing business value. There are a number of advantages to companies in adopting cloud and we have identified the following as the main benefits: **Innovation**, **Time to market**, **Efficiency**, **Security** and **Resilience**.

The global COVID-19 pandemic has acted as a catalyst to bolster the demand for cloud services and solutions, particularly around resilience. For example, Desktop as a Service saw significant growth as employees were required to work from home. Technology teams within organizations have had to review their objectives and strategies, as a result of these changing operational requirements.

Customer cloud adoption is delivering real business value

Innovation
The scale and automation of cloud allow companies to be more innovative. Be it incorporating AI, tracking customer experience, combining Application Programming Interfaces (APIs), or using real-time analytics, conceiving new products is easier with cloud.

Time to market
Fast ramp up is possible. With additional automation in development to ensure agile development, for example CI/CD (Continuous Integration/ Continuous Deployment), changes to products can be delivered faster, so time to market and deployment is faster.

Efficient
With the extensive automation of software-defined platforms, cloud-enabled operations are highly efficient.

Secure
Security will only become more important for organizations and the cloud offers real advantages in this area. With abstraction, automation and extensive monitoring, security can be heightened using cloud-based functionality; this includes vulnerability scanning and workload security.

Resilient
The pandemic has required all organizations to review their business continuity and resilience plans. With everything configured as software, cloud makes it easy to rebuild environments or add redundancy, mirroring and off-site back-up – essential elements of good business planning.

Five primary organization archetypes based on cloud adoption

Through our operational experience and research, we identified a series of categories for organizations embarking on the cloudification journey. These categories and their defining features are by their nature broad; they are designed to guide internal leadership and decision-making teams, partners, and suppliers.

Knowing where their organization fits in the spectrum is a critical step in business and IT leaders defining and ensuring the success of their cloud strategy, and ultimately, in achieving their business goals.

The five archetypes on the cloudification journey

We identified five different types of organizations, or archetypes, depending on their business and cloudification characteristics. These are: **digital natives**, **cloud optimizers**, **cloud pragmatists**, **cautious adopters** or **cloud onlookers**. These archetypes help to provide the context behind the cloudification strategy and choices made by different organizations and serve as a good tool and guide for others looking to develop their own cloud roadmaps.

Digital Native – Born in the cloud
Digital Natives are organizations that were born in the cloud and that were built from the ground up on the cloud, with digital driving the company. They are far more agile than traditional companies, responding to market and customer needs in real time. For digital natives, the public cloud has always been the default choice for them, as they look for technology tools and solutions which follow cloud native principles.

Cloud Optimizer – Public cloud first
Cloud Optimizer organizations have undergone significant digital transformations to move from legacy systems to cloud. They are at the forefront of digital transformations for organizations of their size and age and have mature cloud systems in place. In addition, they prioritize digital, consider public cloud as the future and adopt a public-cloud first strategy.

Cloud Pragmatist – Embraces cloud, typically private cloud
The Cloud Pragmatist has adopted cloud technology, but prefers private cloud to public cloud in order to maintain control over data and workloads. Public cloud is used by a small portion of the organization for non-

business critical workloads. Cloud pragmatists prioritize digital, but their focus is on maintaining control over their data, risks and costs. They consider private cloud as a strategic asset.

Cautious Adopter – Adopting cloud tech, but without enterprise-wide strategy

The Cautious Adopter is adopting cloud in project contexts but is hampered by a lack of ability to translate their cloud ambition to an organizational-wide strategy. While digital is becoming a larger part of the agenda for these organizations, the leadership does not yet fully agree on the relative value that cloud can bring to them. Often there is resistance to significant organizational change and leaders may need additional skills to make the most of the benefits offered by cloud. This results in traditional strategic direction to define a cloud vision and the benefits of increased cloud adoption is unclear for the organization.

Cloud Onlooker – Lacks insight, not actively adopting

Cloud Onlooker organizations do not consider cloud as an imperative, but rather as another form of infrastructure, and do not recognize the holistic value it brings. These organizations have no plan to move to the cloud in the future, but leaders could introduce some isolated cloud solutions if that is better than the alternative. They may be looking at cloud options, but do not consider it a strategic advantage. They are also

PTT Thailand
Undertaking an exciting and ambitious digital transformation

PTT is a Thai state-owned SET-listed energy generation and oil and gas company, which owns and operates extensive gas pipelines, LPG terminals, and other energy assets across the country. Employing 5,000 employees and contract staff, the company is continuously investing in its cloud strategy – currently 10% of its data and applications managed on Public Cloud, 10% on Private Cloud, and 80% using traditional on-premise services.

As PTT continues with its digitalization journey it plans to increase its use of Cloud technology to capture business efficiencies, increase its organizational agility, reduce hardware refresh costs, save data center space, and enable opportunities to leverage new technologies – such as Artificial Intelligence (AI) and Blockchain.

likely to lack the strategic direction and understanding of how the benefits and risks of new technologies apply to the organization.

Five primary organization archetypes observed
Based on cloud adoption stage and selection of cloud technology

■ Public Cloud   ■ Private Cloud

Digital Native	Cloud Optimizer	Cloud Pragmatist	Cautious Adopter	Cloud Onlooker
Born in the cloud, with digital driving the business	Prioritizing digital, considering public cloud as the future	Also prioritize digital, considering private cloud as strategic asset	Adopting cloud in few strategic areas, but lack enterprise-wide strategy	Does not consider cloud as strategic advantage, not consciously adopting

Each of these archetypes exhibits a varying degree of business and technology characteristics which can be evaluated across five key dimensions: **Business Agility**, **Risk Tolerance**, **IT Architecture**, **Tech Intensity** and **Engineering**.

These archetypes help provide context around the cloudification strategy and the choices that are being made by different organizations. It can be a powerful tool for the management team of companies to build awareness of their present state and tailor both their external and internal customer engagement approach and proposition accordingly.

Digital Native

Born in the cloud, making it fully embedded in the company

> "
> Cloud is key in the way we create value for our customers. It is foundational to our business
> "

Overview
Digital Natives are organizations that were built from the ground up on the cloud. They are far more agile than traditional companies, responding to market conditions in real-time. Public cloud has always been the default choice for them as they look for technology tools and solutions which follow cloud-native principles

Key characteristics

Agility

Low	High

Risk tolerance

Risk averse	Risk taking

IT architecture

Monolithic	Microservices

Tech intensity

Low	High

Engineering

Low	High

Business priorities and needs
• Rapid product development and deployment to stay ahead of competitors

Tech priorities and needs
• Willing to take risks on new/innovative technology to stay ahead of the market
• Standardization to a certain level, to improve operations maturity, without hampering innovation
• Data analytics on data stored in multiple environments

People priorities and needs
• Knowledge and best practice sharing

Key challenges
• Inconsistencies in application landscape, leading to difficulties in operations
• Impact of large cloud outage

Cloud Optimizer

Taking on a public-cloud first strategy

> " The organization has made great progress towards digital and we need to stay on track into the future "

Overview
Cloud Optimizer organizations have undergone significant digital transformations to move from legacy systems to cloud. They are at the forefront of digital transformations for organizations of their size and age and have mature cloud systems in place

Key characteristics

Agility

Low — High

Risk tolerance

Risk averse — Risk taking

IT architecture

Monolithic — Microservices

Tech intensity

Low — High

Engineering

Low — High

Business priorities and needs
- Use digital as a differentiator to deliver exceptional customer value

Tech priorities and needs
- Increase agility and speed of development with more automation

People priorities and needs
- Promote a culture of cutting-edge digital adoption throughout the organization

Key challenges
- Poor visibility on escalating cloud costs
- Managing legacy workloads, and the potential impact on innovation (e.g., re-build, retire, move to cloud etc.), taking business, cost, tech, regulatory considerations into account
- Inconsistent management of different environments, no standardized policies
- Cloud provider used in one country is not suitable for another

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Cloud Pragmatist

Embracing cloud, taking on some public cloud but also bringing it into the data center

> " Our focus is to maintain control over our data, our risks and our costs "

Overview
The Cloud Pragmatist has adopted cloud technology, but prefers private cloud rather than public cloud in order to maintain control over data and workloads. Public cloud is used by a small portion of the organization for non-business critical workloads

Key characteristics

Agility

Low — High

Risk tolerance

Risk averse — Risk taking

IT architecture

Monolithic — Microservices

Tech intensity

Low — High

Engineering

Low — High

Business priorities and needs
- Innovate where it matters, while relying on proven foundations already in place

Tech priorities and needs
- Integrated operations for both public cloud, private cloud and bare metal workloads
- Deliberate strategy to decide which workloads are running where
- Maintain control over data, including data security
- Reduce risk of operational failure/disasters
- Avoid CSP/Vendor lock-in

People priorities and needs
- Building a common culture within a multispeed IT organization

Key challenges
- High cost of cloud migration
- Security and compliance concerns
- Data regulatory norms
- Impact of major data center or cloud outage

Cautious Adopter

Adopting cloud technology without enterprise-wide strategy

> " We have started to increase our digital focus, but cloud is still a low priority for us "

Overview
The Cautious Adopter is adopting cloud in project contexts, however is hampered by a lack of ability to translate their ambition into a meaningful strategy. While digital is becoming a larger part of the agenda for these organizations, they do not fully understand yet the value that cloud can bring to the organization

Key characteristics

Agility

Low — High

Risk tolerance

Risk averse — Risk taking

IT architecture

Monolithic — Microservices

Tech intensity

Low — High

Engineering

Low — High

Business priorities and needs
• Maintain in step with competitors' digital agendas, not to be outpaced

Tech priorities and needs
• Introduce new (cloud) tech to increase and improve digital customer experiences
• Integrate cloud solutions with existing application landscape
• Reduce IT costs where possible
• Refresh software/hardware in time

People priorities and needs
• Building in-house expertise on new technologies, while not increasing personnel cost

Key challenges
• Organizational change resistance
• Lack of skills to reap benefits of cloud
• Lack of strategic direction to define cloud vision
• Benefit of increased cloud adoption unclear
• Responding to vendor enforced migrations
• Infrastructure team slows down development teams

Cloud Onlookers

Lacking insights in cloud benefits, and hence not actively adopting

> " We want to make sure IT is running along but IT / cloud is not our strategic priority "

Overview
Cloud Onlookers do not consider cloud as an imperative, but rather as another form of infrastructure, and don't see how this brings any value to them. They do not plan to move to cloud in the future, but could introduce some isolated cloud solutions if it's better than the alternatives

Key characteristics

Agility

Low — High

Risk tolerance

Risk averse — Risk taking

IT architecture

Monolithic — Microservices

Tech intensity

Low — High

Engineering

Low — High

Business priorities and needs
• Business priorities are not driving IT priorities, IT is seen as an order taker

Tech priorities and needs
• Tactically respond to new requests, needs and issues from the business
• Manage and operate existing IT estate efficiently
• Refresh software/hardware based on vendor requirements
• Comply with government guidelines

People priorities and needs
• Turnover of personnel, as high performers lack exposure to new technologies

Key challenges
• Lack of strategic direction and understanding of how the benefits and risks of new technologies apply to the organization
• Legacy technology systems and processes
• Insufficient reliability of IT
• Lack of internal capabilities

7 key questions to identify organization archetype

		Digital Native	Cloud Optimizer	Cloud Pragmatist	Cautious Adopter	Cloud Onlooker
1	How important is technology for your business?	Technology defines our business	Technology allows us to differentiate ourselves	Technology allows us to differentiate ourselves	Without technology we will be made redundant	Technology is not very important in our line of business
2	What best describes your engineering departments?	Engineering is part of our corporate culture, we have the best talent	Actively growing the engineering practices, using Agile, DevOps	Actively growing the engineering practices, using Agile, DevOps	Traditional development teams, with some teams adopting agile	We hardly have in-house developers, we rely on existing technology
3	How long does it take you to get new features into production	Between a few days and 2 weeks	2 to 4 weeks	1 to 2 months	2 to 4 months	2 to 6 months
4	What best describes your IT application & platform landscape?	Fully automated self-healing containerized infrastructure	Moving towards new-age platforms with microservices etc	Our monolithic legacy remains, combined with modern architectures	Most remains traditional, but in certain areas we adopt new architectures	We lack a clear architecture vision, based on big monoliths
5	How large is your on-premise footprint, including private cloud?	We have the bare minimum	We still have on-premise servers, but we'd rather move away	We're building out a private cloud, along with the public cloud	Our infrastructure is still on-premise, but already virtualized	Our infrastructure is still on-premise, and lacks big investments
6	What would you choose between innovation and reliability/ compliance?	Innovation is the only way for us	We're ready to take risks if we can differentiate	We accept risks within well-defined boundaries, but not on compliance	Reliability is most important, but ok to experiment in areas	IT is not our way of innovating, that's for others to do
7	Are you open to adopt Open Source?	Yes, we prefer to use Open Source platforms	Yes, when we have an internal team that can support it	Only when supported by enterprise contracts	Preferably not, we don't have the skillsets to support	We would not know how to deal with it

Tailor-made cloud journeys for each organization

Depending on the organization archetype, entities will adopt cloud in different ways, and have a different journey. Each organization's journey to the cloud follows a unique path subject to its context and needs and can be viewed across four stages of adoption.

It is vital to identify sources of business value which are driving cloud adoption. In doing this, leaders can leverage the strong connection between triggers and business value drivers to better understand the context for cloud adoption, define the strategy and ensure a successful implementation.

Of course, there are organizations that do not encounter a trigger, or the trigger is perhaps not significant enough, to propel them to the next stage on the cloud journey. In these situations, external support and counsel can be critical to a management team in driving the organization's cloudification strategy. To avoid operational inefficiencies and unnecessary costs, it is important not to remain in one stage for too long.

Four stages to cloudification

Organizations do not follow a standard timeline and different companies, in different sectors and even business units within the same group, move through the stages on a different timeline. Typically, organizations focus first on cloudifying the front-end and then the back-end, before the rest of the stack.

Organizations may leverage a mix of public and private cloud technologies to cloudify. The mix can vary based on an organization's starting point and context. An organization's cloud adoption can be viewed across four key stages – **Initial or ad-hoc**, **Experiment**, **Scale**, **Operate@Scale**. Although they do not follow a standard timeline, organizations typically require a 'trigger' to move to the next stage; trigger examples include business demand and critical mass in cloud. In this chapter, we look at each stage and the relevant triggers for each phase of the cloud adoption journey.

Initial / Ad-hoc

In the initial phase, the organization is not pursuing cloudified solutions, but these may be introduced on an ad-hoc basis. For example, a business unit or regional team starts using SaaS products within the Marketing department. The IT team may have a specific initiative to improve efficiency or automation, or there could be a migration of a non-business system. Often in the ad-hoc stage, only a small percentage of applications are hosted in the cloud.

The triggers to move from this phase to **Experiment** are normally from the front-end and a result of business demand, or potentially, a flagship internal digital program, such as CX improvement and analytics.

Experiment

In this stage, priority is given to **digital programs which are championed by businesses that leverage cloud solutions** and require **business and IT** to work together (e.g., digital channel solutions, new data lake set-up). The cloud solutions may still be largely in the experimental phase, with a high percentage of solutions still hosted on the premises of the organization. The first transformations often focus on improving the customer experience or leveraging analytics for better insights.

In this stage, the cloudified technology may be managed by program, for a specific outcome, or within a specific domain. The triggers in the **Experiment** phase that drive organizations to move to **Scale**, include critical mass in

Kasikornbank (KBank) Thailand
Taking the first steps on the cloud adoption journey

Kasikornbank (KBank) is one of the largest banking groups in Thailand, and it also has regional expansion plans for ASEAN, China and Japan.

The bank's IT services are largely managed by a subsidiary company, Kasikorn Business-Technology Group (KBTG), which has 1,500 employees including IT Architects, DevOps, and Engineers. This model allows the bank to focus more acutely on its core business, and innovating services for customers.

As part of its next chapter, including its international expansion plans, KBank has set in motion ambitious plans for digitalization, which includes increasing the adoption of cloud technology. Currently, 30 out of 500 of the bank's applications are hosted in the public cloud, and its technology comprises largely of SaaS solutions.

KBank is confident that greater cloud adoption will help its clients access new applications and technologies that can enhance its operations and customer experience.

cloud, or a push for an improved digital agenda from the leadership team. Another typical trigger in this stage is operational experience of multiple incidents and inefficient operations by the organization in the experiment phase. In addition, the move to the Scale stage could also be triggered by an external pressure, such as a vendor enforced migration of core business system.

Scale

In the Scale stage, enterprises have defined an organization-wide cloud approach and strategy. The cloud foundations are in place to simplify and industrialize the use of cloudified technology with the company. Cloudification is now also for core business systems like ERP (enterprise resource planning) and

CRM (customer relationship management) systems. The migration of apps may have started in tranches, with continuous adjustment of strategy alongside feasibility, and other systems being rolled out to support the transformation. At this stage, the organization may have experimented with cloud for a number of years and has a bold set of digital ambitions, which are clearly defined.
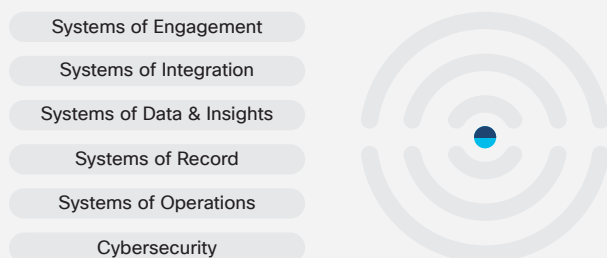
The triggers to move from the **Scale** stage to the **Operate@Scale** stage include planned migration, completion of activities and the operating model being fully set up. The establishment of the appropriate governance and team structures with clear responsibilities is another trigger which shifts an organization to the Operate@Scale stage.

Typically, organizations focus first on cloudifying digital front-ends and data & analytics platforms, before rest of the stack

Level of cloudification

01 Initial/Ad-hoc

At maximum a non-business critical component, which is most often a non-integrated SaaS solution

- Systems of Engagement
- Systems of Integration
- Systems of Data & Insights
- Systems of Record
- Systems of Operations
- Cybersecurity

02 Experiment

First transformations focus on improvement of customer experience or leveraging analytics for better insights. E.g. new mobile app or PowerBI for sales insights

- Systems of Engagement
- Systems of Integration
- Systems of Data & Insights
- Systems of Record
- Systems of Operations
- Cybersecurity

03 Scale

Cloudification continues, now also for core business systems like ERP and CRM systems. Supporting systems follow to support the transformation

- Systems of Engagement
- Systems of Integration
- Systems of Data & Insights
- Systems of Record
- Systems of Operations
- Cybersecurity

04 Operate@Scale

Cloudification continues across the full stack of the business

- Systems of Engagement
- Systems of Integration
- Systems of Data & Insights
- Systems of Record
- Systems of Operations
- Cybersecurity

Operate@Scale

At this stage, the public and private cloud is run like any technology in business as usual, with technology lifecycle and improvement programs at the center of the decision making within the organization. Cloudification continues across the stack. Some organizations may remain in the Experiment stage for a long time, while others will seek to move from that as rapidly as possible. Each organization has a different timeline for reaching the Operate@Scale stage, but this is an objective that all forward-looking management teams are considering when they evaluate their cloud status.

How Cisco supports customers

At Cisco, we support customers as they move to the hybrid multi-cloud reality. We do this through our strong capabilities in the following critical areas:

- **Support and monitor application performance** and provide **cloud migration** assurance.
- **Reduce complexities of managing and optimizing workloads** with a unified view across multiple environments.
- **Platform-agnostic** to easily deploy and manage open-source software.
- **Secures network against advanced threats** and **policy enforcement** with runtime protection.
- **Cloud-native, built-in security platform** providing unified security console with cross product analytics.
- **Automates infrastructure management on-premise and across cloudified environments.**
- **Unified visibility and configuration** of connectivity across environments and full-stack observability.
- **Operate Apache Kafka on Kubernetes** for seamless operations.
- **Deliver consistent performance across Hyper-converged infra** at a distributed scale.

Our findings show that organizations typically start their cloudification journey by focusing first on cloudifying digital front-ends and data and analytics platforms, before the rest of the stack. Depending on its situation, an organization may leverage a mix of public and private cloud technologies to cloudify. The mix can vary based on an organization's starting point and context, and most importantly, there is no standard timeline. Every organization moves from one stage to another in the development of their cloud at a different pace, and as a result of different reasons, or triggers.

Enterprises will shape the future of cloud

To date the cloud story has been shaped by public cloud providers; but the next phase will be defined by the enterprises themselves. Many organizations adopted public cloud as a silver bullet without the necessary planning and preparation and are only now realizing some of the challenges and risks associated with it.

Several organizations have undertaken repatriation of workloads from public cloud to mitigate cost challenges, or to meet regulatory and security requirements. With the advent of Edge and distributed computing, some of the digital natives are now also moving inside the Data Center.

Our research, by reviewing the market overall from a macro perspective and then examining it from the perspective of the customer and their experience, has identified 16 typical hybrid and multi-cloud use cases. These primary use cases have been mapped against the main benefits of adopting the cloud:

16 potential use cases identified in hybrid / multi-cloud space

Innovate	Time to Market	Efficient	Secure	Resilient
SaaS application integration	Self-service and automated infrastructure for developers	Consistent, efficient and automated management	Automated compliance validation	Cross-cloud High Availability and DR
Data integration across clouds	Cloud migration assistance	Cost management and optimization across clouds	Integrated IAM across clouds	
Edge hosting	Advanced PaaS	Workload portability to different clouds	Integrated network security across clouds	
		Multi-cloud networking	Secure app, workloads and data consistently	
		Archiving in cloud		

Optimizing your public and private cloud mix

Our experience shows that companies are continuously optimizing their mix of public and private cloud environments. With the advent of Edge and distributed computing, some of the digital natives are now also moving inside the Data Center. We have identified two typical scenarios for the shift of the mix from public towards private cloud technologies.

The first is what we call **'Cloud repatriation'**. This sees the shifting of existing workloads, which have been on the public cloud to date, to private cloud. The customers we have seen doing this have done it for a number of reasons including regulatory requirements in financial services, cost optimizations, and where there has been very high storage demand, faster innovation and risk management of security concerns.

The second we call **'Growth with private cloud'**. This is where we see the addition of more on-premise cloudification, and an expansion of the footprint to take on existing public cloud workloads. Drivers we have seen for this include expansion into new geographical markets, with limited public cloud presence, strict regulation and the desire to serve customers more effectively, in particular by locating closer to the center of demand at edge locations.

In both examples, it is important to emphasize the types of organizations doing this are not just cautious adopters, but also cloud optimists, cloud pragmatists and digital natives. Digital natives for example, leverage on-premise environments for several reasons including increased resiliency, flexibility and cost effectiveness. They have massive data needs, so having a mix between on-premise and public cloud capacity is cost effective, while also enabling flexibility.

Cloud service providers have in the past pushed the cloud itself as the aspiration and end goal for customers, when in fact, this needs to be personalized and there is no pre-defined journey. They have focused on the benefits of moving to the cloud and underplayed the operational risks.

Full-stack observability

We all know applications have become part of our everyday life and are the primary way we interact with many products and services. Increasing consumer demand for a seamless digital experience with each application interaction – whether shopping online or working remotely – means service providers must ensure every component of their application runs smoothly. This has led to a significant increase in complexity in IT environments.

Multiple teams are often involved in monitoring the performance, optimization and security of a digital experience. By examining each component, such as application services, networks, public cloud, private cloud and databases, the traditional domain-centric monitoring tools can only help you understand some of the insights produced.

Many providers only focus on visibility across a single technology stack, but full-stack observability gives all teams insights and actions that result in improved business and digital customer experiences. Only full-stack observability gives you the ability to move beyond just monitoring to a paradigm shift that delivers shared context across teams and enables organizations to deliver exceptional digital experiences, optimized for cost, security and performance and designed to maximize digital business revenue.

Conclusion

The growth in the cloud market in Asia Pacific is significant. We expect to see double digit growth of investment into cloud deployments across emerging markets and high single figure growth in developed markets.

No company, government department or leadership team starts from the same position. It is critical to begin by acknowledging the unique challenges and opportunities presented by your circumstances. The commonalities in cloud adoption and deployment have proven crucial in helping management teams communicate their strategy with key stakeholders and customers. You must be clear on your objectives and operational reality, to ensure you make the right cloud adoption decisions at the right time.

We have provided an overview of the key requirements and capabilities of hybrid cloud, and the potential size of the opportunity for customers and partners. Cloud is not a one size fits all solution. Organizations

will need to be mindful in navigating the different cloudification choices in front of them. They can do this by developing a clear cloudification strategy that meets their diverse requirements and prioritizes their business interests and objectives. As business and applications rely more every day on the smooth running of highly interdependent systems, understanding the intersecting and overlapping domains will become ever more important. Full-stack observability will bring these different domains together to provide business critical insights.

Every cloudification journey is unique. From the starting point to the mix of public and private cloud technologies, from the timing to the triggers that drive a particular change, each organization's experience with the cloud will be different. At Cisco we look forward to working with leaders to support them and their organizations as they navigate this journey, regardless of the path they choose to take.

Definitions

The US National Institute of Standards and Technology (NIST) defines cloud technologies as a model for enabling ubiquitous, convenient, on-demand network access to a shared pool of configurable computing resources (e.g., networks, servers, storage, applications, and services) that can be rapidly provisioned and released with minimal management effort or service provider interaction[1]. NIST identifies five key characteristics of cloud transformation: on-demand self-service, broad network access, resource pooling, rapid elasticity and measured service.

[1] https://csrc.nist.gov/publications/detail/sp/800-145/final

Public, private, hybrid cloud

Cloud is happening in the public, private and hybrid arena. The **public cloud** is when organizations share the underlying infrastructure and use a cloud service provider. The **private cloud** utilizes a dedicated infrastructure, which can either be owned by a service provider, or the organization themselves.

A **hybrid cloud** is a combination of public and private, which normally sees an organization use infrastructure on their premises, a private cloud, combined with a public cloud. Under a hybrid cloud set-up, data and applications should be able to move between the two environments.

About Boston Consulting Group

Boston Consulting Group partners with leaders in business and society to tackle their most important challenges and capture their greatest opportunities. BCG was the pioneer in business strategy when it was founded in 1963. Today, we work closely with clients to embrace a transformational approach aimed at benefiting all stakeholders—empowering organizations to grow, build sustainable competitive advantage, and drive positive societal impact.

Our diverse, global teams bring deep industry and functional expertise and a range of perspectives that question the status quo and spark change. BCG delivers solutions through leading-edge management consulting, technology and design, and corporate and digital ventures. We work in a uniquely collaborative model across the firm and throughout all levels of the client organization, fueled by the goal of helping our clients thrive and enabling them to make the world a better place.

About Cisco

Cisco (NASDAQ: CSCO) is the worldwide leader in technology that powers the Internet. Cisco inspires new possibilities by reimagining your applications, securing your data, transforming your infrastructure, and empowering your teams for a global and inclusive future.
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