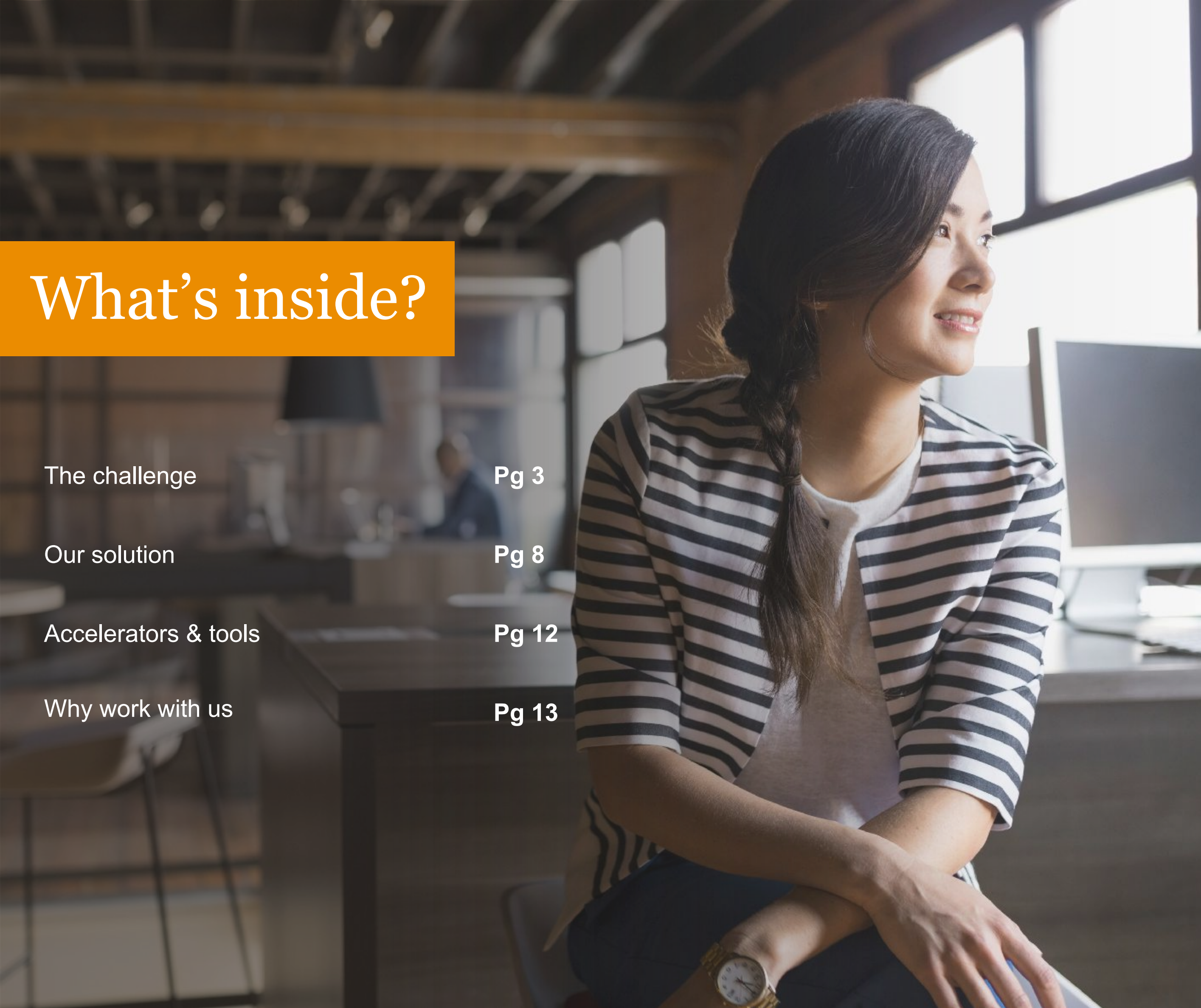


Cloud Financial Optimization

Capture cloud inefficiency and reinvest in the business.





What's inside?

The challenge

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Our solution

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Accelerators & tools

Pg 12

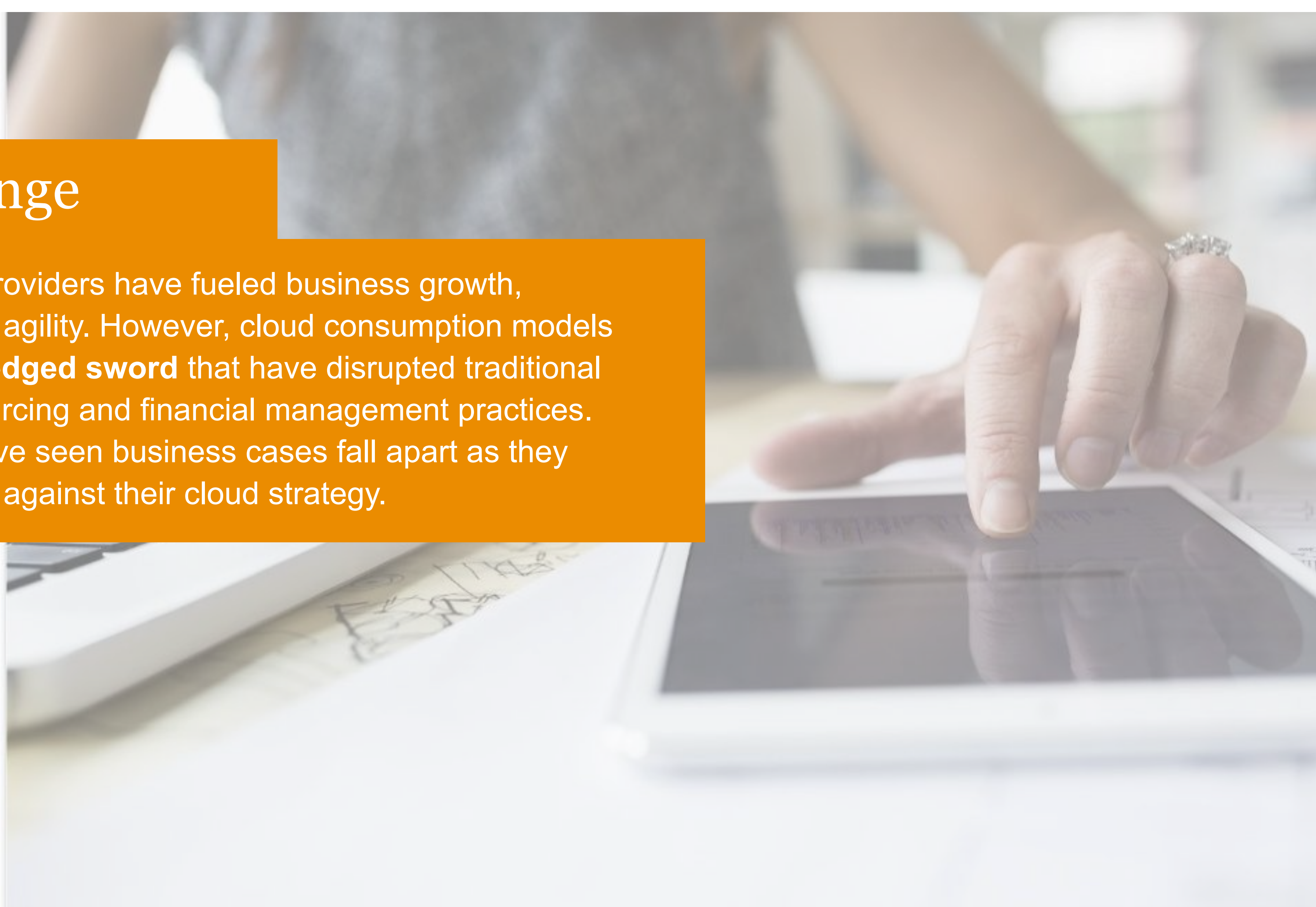
Why work with us

Pg 13



The challenge

Public Cloud providers have fueled business growth, innovation and agility. However, cloud consumption models are a **double-edged sword** that have disrupted traditional technology sourcing and financial management practices. Companies have seen business cases fall apart as they have executed against their cloud strategy.



Main challenges

Did you know...

35% of cloud spend is wasted on inefficiencies ¹

Factors can be:

- Lack of organizational awareness on cloud provider's billing models & pricing structures
- Extreme granularity in cloud provider bills
- Complexities in cloud providers' price list in different regions
- Constant change in cloud provider offerings
- Complex deployment models across multiple Public Clouds
- Ease of resource provisioning
- Lack of standardization between different cloud providers
- Complexity in forecasting demand and managing capacity



Discrepancy between expected and actual cost savings

When surveyed, companies said that **cost savings** is the main driver for Public Cloud adoption however, when asked what are the primary pain points for companies to move to Public Cloud the leader was **cloud costs**.



Other areas of waste ²

53%

of companies monitor their cloud bill.

46%

of companies leverage cloud provider incentives.

57%

of companies monitor their cloud usage.

“

Financial success in the cloud needs new skills, guardrails, tools, and the adoption of a new company culture to mature with the paradigm shift in technology consumption.




What we are hearing

Companies need to make changes across four dimensions to begin meeting the goals of cost reduction and sustained efficiency




Process & Controls

- Lack of organizational awareness on cloud provider's billing models & pricing structures
- Managing enterprise accounts and access to the public cloud



Cloud Architecture

- Constant change in cloud provider offerings
- Choosing the right storage options
- Leveraging managed resources (SaaS / Paas)



People & Organization

- Constant change in cloud provider offerings
- Choosing the right storage options
- Leveraging managed resources (SaaS / Paas)



Enabling Tools

- Ease of resource provisioning
- Complexity in forecasting demand and managing capacity
- Complex deployment models across multiple Public Clouds



Are you asking the right questions?

TECHNOLOGY LEADERS

- How are you empowering application-team accountability for cloud spend?
- Is your architecture sized and optimized for the cloud?
- How do you weave a mindset of efficiency into the fabric of the design process?
- How can you evolve the conversation from savings to business value?

FINANCE LEADERS

- How are you driving budget accountability?
- How will you identify where you are wasting cloud spend and capture those savings?
- What impact is cloud having on your accounting and tax positions?
- How accurately are you forecasting cloud spend and gaining visibility into unit cost?

SOURCING LEADERS

- Are you positioned for and taking advantage of all available provider discounts?
- How are you governing spend when purchase orders no longer serve as a control to limit consumption?
- How are you collaborating with Finance and Technology teams in managing spend?



Our solution

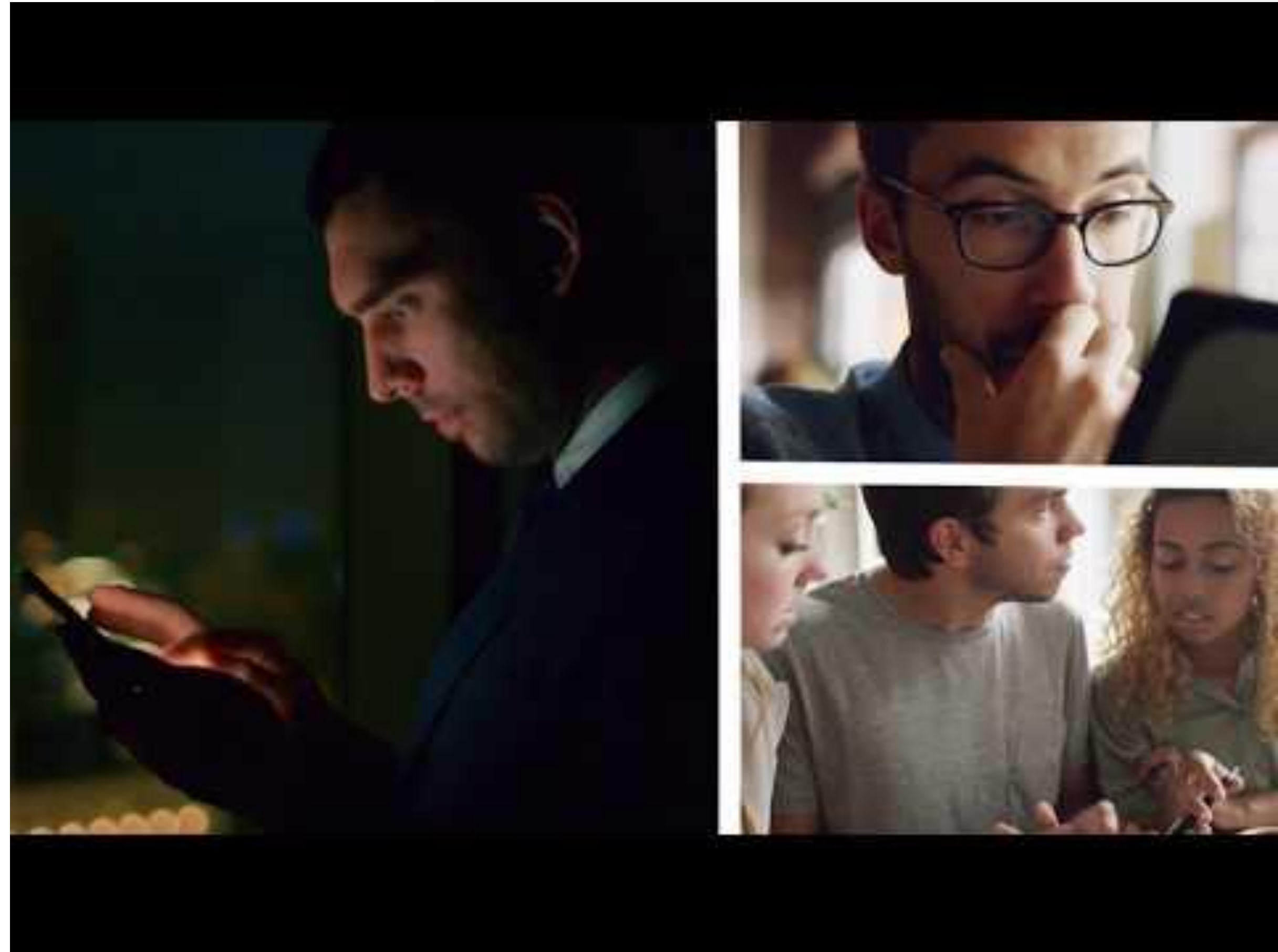
Our solution

PwC's Cloud Financial Optimization (CFO)

Our CFO offering leverages our expertise across sourcing excellence, financial effectiveness, and cloud architecture to help you identify, action and avoid cloud usage inefficiency.

The result?

Powered by digital accelerators, within 4 weeks, we can assess your cloud efficiency across people, process, architecture and tools to provide both a savings and capability maturity roadmap, so you can potentially drive your costs down and focus on what really matters.



One solution that addresses *all domains* for sustained efficiency



Process & Controls

Define and implement the processes / workflows needed for cost efficiency

Establish automated controls

Setup notification workflows for anomalies and unusual spikes

Create and implement tagging standards for cost allocation

Establish cloud incentive models with cost showback / chargeback

Define strategy and process for Reserved Instance purchases

Define the budget and forecasting process for cloud spend

Implement unit economics to measure cloud cost and profitability on individual unit level

Analyze and benchmark enterprise agreement with the cloud provider



Cloud Architecture

Define architecture standards, e.g. which regions, VM types, storage classes, resource generations, etc. to use based on use cases

Analyze services to help identify which ones could benefit from more cloud-native and managed services, such as serverless or other PaaS / SaaS (instead of IaaS)

Implement strategy for usage of Spot Instances based on use cases



People & Organization

Establish a Cloud Efficiency Office / Center of Excellence

Define and train the roles needed for cloud financial management and optimization

Establish periodic meetings with cloud practitioners to share leading practices in the area of cloud efficiency

Establish periodic review of cloud offerings



Enabling Tools

Implement the appropriate tools for cost insights and recommendations

Leverage automation tools and rule engines

Integrate cloud insight tools for cost allocation and chargeback models

Establish dashboards and reports, addressing various target groups from practitioners to executives

Bring gamification to cloud efficiency by scoring various team's efficiency posture in a leaderboard for competition

Our solution

Our **Cloud Financial Optimization** offering blends our world class capabilities in Finance Effectiveness, Sourcing Excellence, and Cloud Architecture, while reinvesting in competitive differentiation to help you:

- **Forecast cloud costs**
- **Remove cloud waste**
- **Sustain cloud efficiencies**



Key offerings

01 Cloud Forecaster

Determine the total cost of ownership to migrate and host workloads in the cloud.

02 Cloud Optimizer

Identify waste reduction and optimization opportunities across the current cloud landscape.

03 Cloud Efficiency Office

Sustain cloud efficiencies through automation, architecture, controls and a flexible operating model.

Cloud Optimizer

Unlocking Liquidity and Sustaining Efficiency

Cloud Optimizer is a packaged service to rapidly identify cost reduction opportunities and make that recovered cash available to other parts of the business.

Built on PwC's history of financial distinction and deep industry experience, Cloud Optimizer provides the **insight to recapture wasted spend and reinvest it back into your organization for greater return.**

On average, we have helped our clients **identify and realize savings on cloud spend of 10-30%.**

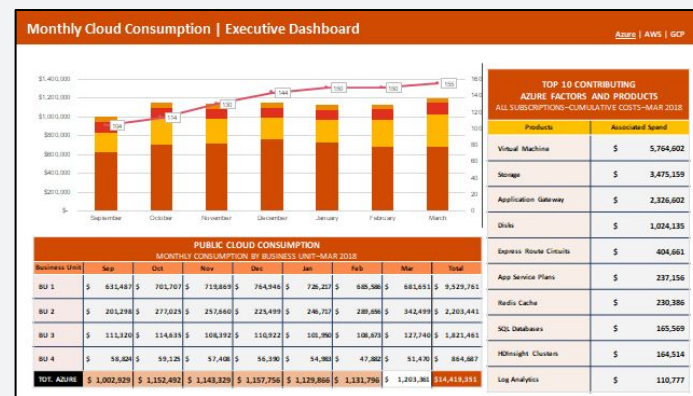
4- week approach

Outputs

Outcomes

Understand Usage

Create visibility into actual cloud consumption across teams, develop a pilot cost model to enable demand-based forecasting



Detailed analysis of cloud costs & optimization opportunities using templated, native reporting tools

- Enhanced financial accountability across teams
- Improved accuracy of cloud cost forecasts
- Visibility into unit economics and value creation

Gain Control

Baseline technology and process efficiency, identify savings opportunities

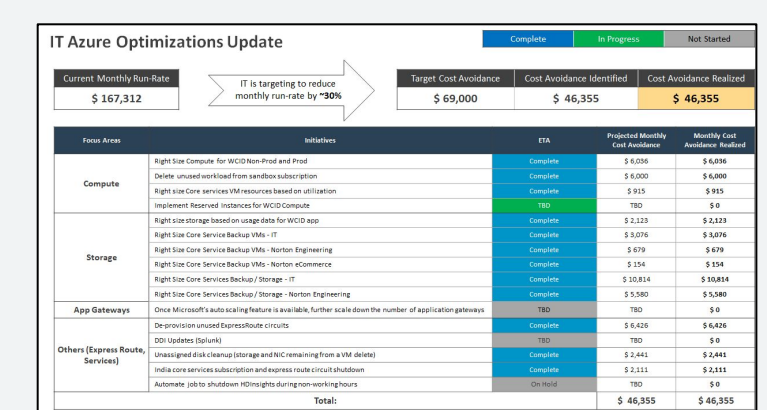
Process & Controls	3.8	Cloud Architecture	2.9	People & Organization	2.8	Enabling Tools	3.7
Logging Policy	3	Logging Retention	3	Cloud 255 users/20%	5	Cloud Financial Reports and Dashboards	5
Resource Provider	5	Labels/Resource Identifiers Usage	4	Global Network Challenge	5	Logging Compliance Tool	5
Resource Pricing	2	Resource Provisioning	5	Cloud Pricing	5	Logging Tool	5
Resource Management	3	Resource Allocation	3	Cloud Configuration	5	Logging and Audit Logs	5
Resource Control Policies	3	Resource Provisioning Compliance	3	Cloud Network Manager Relationship	5	Network Traffic Analysis Platform Tool	5
Resource Usage Monitoring	4	Resource Provisioning	4	Cloud Network Manager Relationship	5	Cloud Configuration Tool	5
		Cost of Cloud to Unit Metric	2			Configuration Tool	5
		Access App Service Plans for SQL DBs	2			CloudWatch - Alarm Check Tool	5
		Cloud SQL, Oracle DBs	2			Configuration Platform	5
		SQL Storage for SQL Databases	2				
		Cloud SQL, Oracle DBs	2				
		Cloud SQL, Oracle DBs	2				
		Cloud SQL, Oracle DBs	2				
		Cloud SQL, Oracle DBs	2				
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		Cloud SQL, Oracle DBs	2				
		Cloud SQL, Oracle DBs	2				

A holistic view of cloud efficiency, including use of technology, process governance and teaming

- Lightweight cloud governance & controls reporting
- Alignment to leading practice efficiency guardrails
- Collaborative engagement model with other teams

Plan for Optimization

Confirm optimization savings potential and business impact of value realization activities



Prioritized cost savings recommendations with savings potential and implementation effort

- Tangible savings opportunities
- Enhanced insight into expected return on cloud investments

Accelerators & Tools

Proven accelerators

1 Cloud Efficiency Scorecard. Internal benchmarking of cloud optimization maturity.

Process & Controls	3.8	Cloud Architecture	2.9	People & Organization	2.8	Enabling Tools	3.7	
Techniques	Score	Weight	Techniques	Score	Weight	Techniques	Score	Weight
Tagging Policy	5	3	Right-sizing Resources	3	1	Cloud Financial Reports and Dashboards	5	1
Resource Baseline	5	1	Least Resource Consumption Usage	4	1	Cloud Financial Champion	1	1
Enterprise Pricing	5	5	Remove Unused Storage	3	1	Cloud Training	2	1
Account Management	4	3	Spot Instances	3	1	Cloud Certifications	1	1
Reserved Virtual Machine	3	1	Across Hosting Locations Competition	1	1	Cloud Technical Account Manager Relationship	3	1
Unused Virtual Machines	4	3	Container Platforms	4	2	Reserved Virtual Machine Planning Tool	5	1
			Ratio of Paid-to-Used services	2	3	Unit Economics Tool	1	1
			Amazon App Service Plans for Web Apps	4	3	Outlier Detection Tool	5	1
			Use S3A Elastic Policy	2	3	Chargeback / Show Back Tool	1	1
			AWS Storage for VPC Endpoints	3	1	Orchestration Platform	1	1
			Elasticity Policies	4	1			
			Controlled Change of Provisioned IOPS	2	1			
			Incremental Backups	3	3			
			Auto Scaling	4	3			

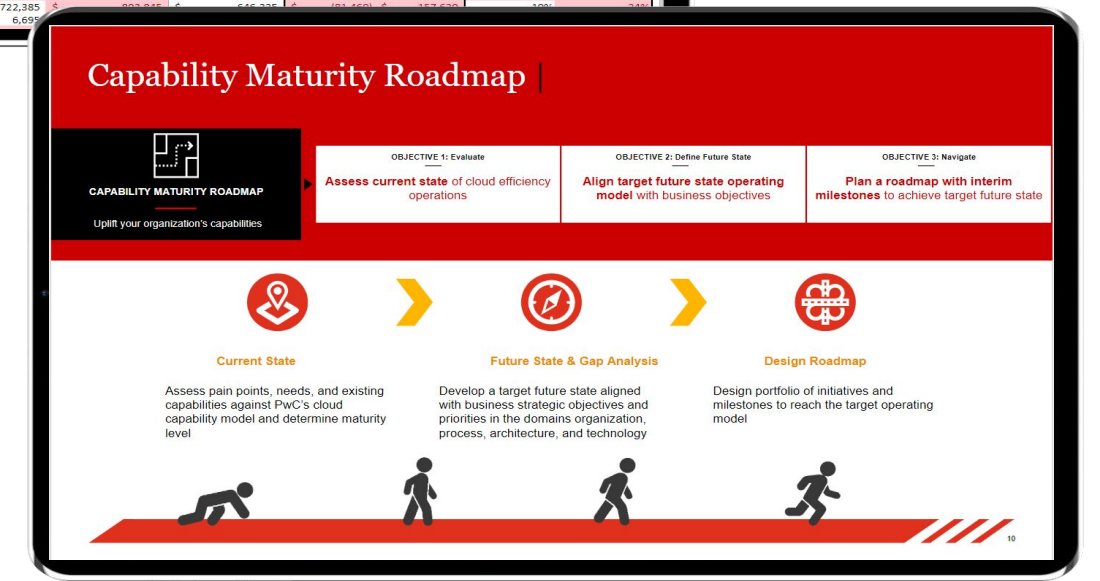
2 Cloud Financial Management. Detailed analysis of cloud costs and cloud optimization recommendations.

Component	5/4/2020	5/5/2020	5/6/2020	5/7/2020	5/8/2020	5/9/2020
Core	\$1,754.74	\$1,746.94	\$1,762.53	\$1,896.16	\$1,805.36	\$1,717.19
Compute Cluster	\$1,489.94	\$1,477.34	\$1,414.13	\$1,345.70	\$1,455.91	\$1,519.19
HDF Cluster	\$1,242.41	\$1,242.13	\$1,241.95	\$1,241.92	\$1,241.84	\$1,241.84
Enterprise Cluster	\$843.09	\$842.47	\$842.65	\$842.67	\$842.72	\$842.72
OpenLDAP	\$284.91	\$284.83	\$285.01	\$284.76	\$284.93	\$284.93
Interactive Cluster	\$190.79	\$190.20	\$190.21	\$190.21	\$190.21	\$190.21
Ephemeral Cluster	\$108.62	\$108.51	\$108.51	\$107.31	\$105.30	\$105.30
Apache NiFi Kafka	\$38.77	\$38.77	\$38.77	\$38.77	\$38.77	\$38.77
Cloudbreak Verification	\$38.68	\$38.68	\$38.69	\$38.68	\$38.69	\$38.69
Knox Cluster	\$0.23	\$0.22	\$0.22	\$0.22	\$0.22	\$0.22
Total	\$5,972.07	\$5,970.08	\$5,920.68	\$5,990.39	\$6,043.97	\$6,211.62

3 Cloud Spending Alerts Methodology. Recurring analysis of cloud financial and usage data to identify spending anomalies.

Application Team	AWS Service	2019-17	2019-18	2019-19	2019-20	2019-21	2019-22
Application A	EC2	\$ 165,766	\$ 166,110	\$ 165,687	\$ 164,456	\$ 165,379	\$ 168,473
	S3*	\$ 64	\$ 68	\$ 62	\$ 68	\$ 68	\$ 73
	RDS*	\$ 7,407	\$ 7,030	\$ 7,450	\$ 7,406	\$ 7,714	\$ 8,027
Application B	EC2	\$ 22,580	\$ 22,580	\$ 21,973	\$ 21,960	\$ 21,985	\$ 21,494
	S3*	\$ 26,643	\$ 26,862	\$ 26,455	\$ 25,878	\$ 25,320	\$ 24,803
	RDS*	\$ 22,580	\$ 22,580	\$ 21,973	\$ 21,960	\$ 21,985	\$ 21,494
Application C	EC2	\$ 240,419	\$ 264,492	\$ 259,167	\$ 266,865	\$ 266,393	\$ 261,203
	S3*	\$ 161,788	\$ 164,224	\$ 196,797	\$ 199,624	\$ 210,798	\$ 212,025
	RDS*	\$ 1,660	\$ 1,628	\$ 1,702	\$ 1,706	\$ 1,692	\$ 1,665
Application D	EC2	\$ 84,522	\$ 84,607	\$ 84,822	\$ 81,536	\$ 76,481	\$ 71,746
	S3*	\$ 500	\$ 347	\$ 556	\$ 544	\$ 537	\$ 537
	RDS*	\$ 5,761	\$ 5,699	\$ 5,587	\$ 5,441	\$ 5,180	\$ 4,039

4 Cloud Capability Maturity Roadmap. Plot out a crawl-walk-run plan to uplift your organizational capabilities





Why work with us & next steps

Why work with us?

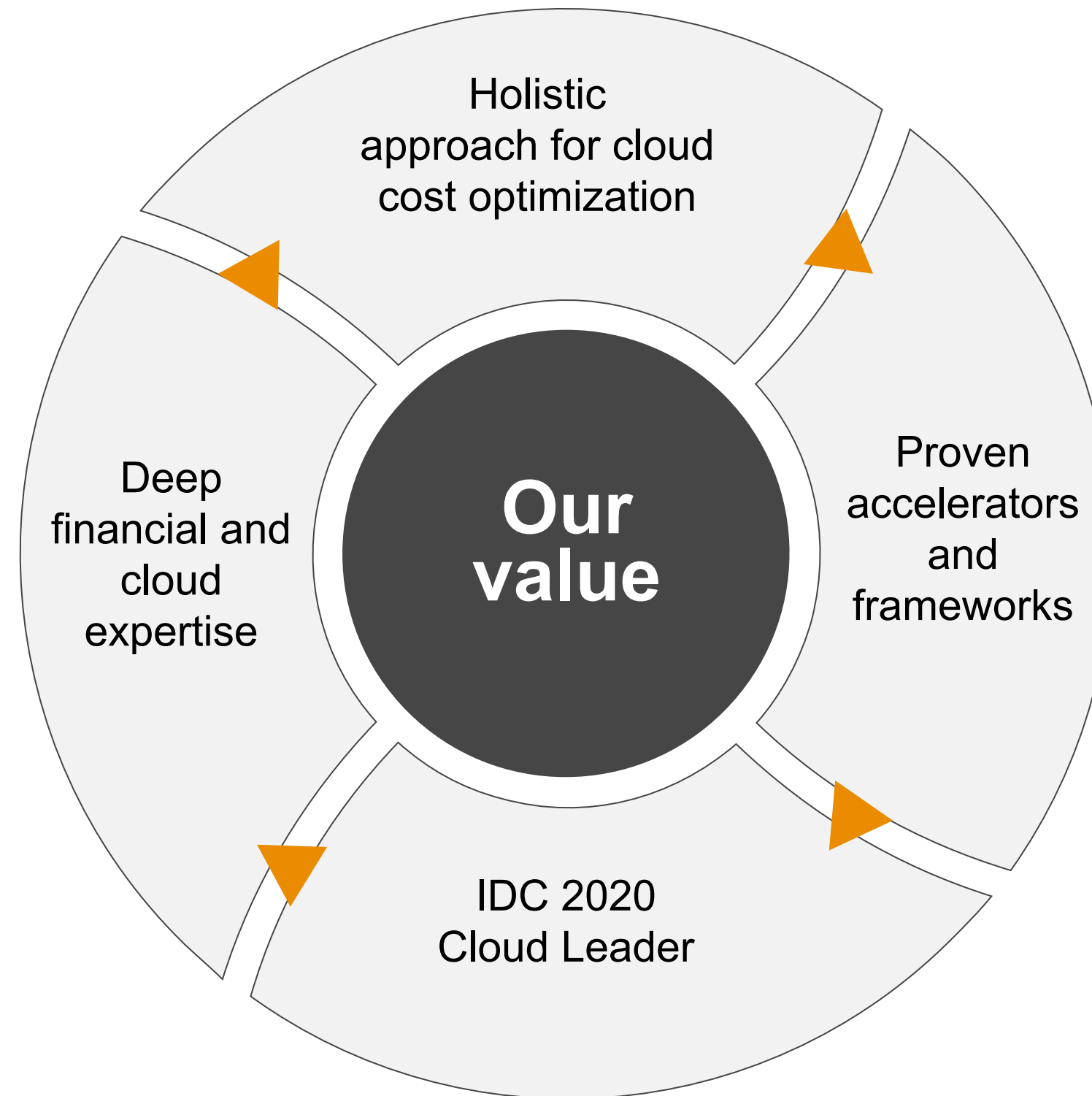
Holistic approach for cloud cost optimization

Our holistic approach covers four domains for sustained efficiency and cost reduction:

- Process & Controls
- Cloud Architecture
- People and Organization
- Enabling Tools

Deep financial and cloud expertise

- Our expertise in **financial and operational excellence**, along with our **deep knowledge in cloud**, provides unique capabilities for cloud costs effectiveness
- **Over 3,500 cloud practitioners** across PwC's global network
- **A cloud innovation lab** that is geared towards advancing knowledge, leading practices, and insights
- **Over 800 cloud engagements** performed over the past 12 months at over 550 clients.
- **Over 40% of clients** engaged PwC for additional cloud services



Proven accelerators and frameworks

- **Cloud Efficiency Scorecard:** PwC's cloud efficiency scorecard helps to identify weakness across the four assessment domains and provides recommendations to improve cloud spend.
- **Optimization Techniques:** An extensive library of methods to improve cloud spend for all major cloud service provider. The techniques are based on PwC and industry leading practice
- **Strategic Microsoft Alliance:** As a GSI and strategic partner we collaborate on a variety of Azure cloud financial management tools

IDC 2020 Cloud Leader

PwC named a Leader in Worldwide Cloud Professional Services by IDC MarketScape, 2020

- "Buyers rate PwC highly for its innovation capabilities and its overall prospects. IDC notes PwC's employee strategy and the breadth of its offerings around applications-centric platforms. PwC's approach to cloud is about solving business problems in a way that they are supported and enabled by technology, but not driven by technology alone."

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