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IT EXECUTIVE INSIGHT
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Supercharge Financial Performance With Amazon Web Services

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EXECUTIVE SUMMARY

An analysis of Hackett's Cloud Services Study showed that organizations with workloads on Amazon Web Services (AWS) achieved an annualized average of 4.2X better financial performance than comparable organizations.[1] The analysis further showed the number of workloads migrated to the cloud and the amount of time on the cloud have a strong relationship with financial performance.

These include:

- Annualized increases in EBITDA of 5% to 7% and enterprise value (EV) of 8% to 12%, and earnings per share up to 10% for companies with higher and earlier cloud adoption (percentage of infrastructure in the cloud and duration in the cloud).
- Top performers are, on average, one year further into their cloud journeys and achieved 128% higher EBITDA when compared to the peer group.
- Outperformance of median EBITDA growth was heavily concentrated in industries with a greater adherence to cloud best practices. These industries were: Banking, media and entertainment, healthcare, and telecommunications.
- Cloud best practices utilized by these industries include increased levels of planning and forecasting, measurement and accountability, centralized cloud financial operations, and optimized cloud migration methodologies (see "Appendix" for details).
- Top performers balance the velocity of cloud adoption with their hands-on experience of utilizing cloud best practices.

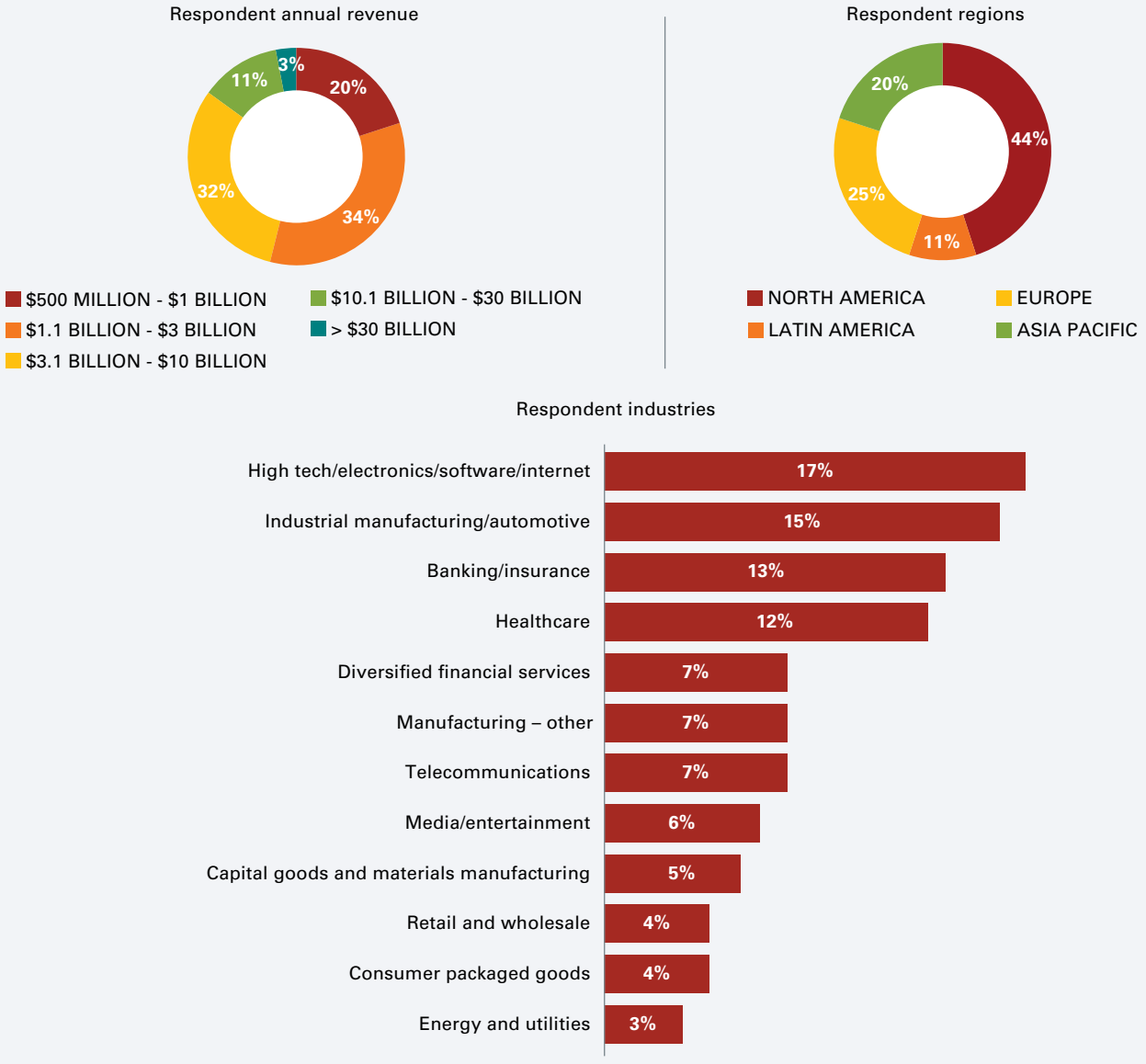
[1] See "Appendix" for comparison of Cloud Services Study participant financial performance to market indices.

About the Study

The Hackett Group conducted its global Cloud Services Study of more than 1,000 organizations from October through December 2021. The purpose of the study was to evaluate the business value of migrating from on-premises hosting to cloud-hosted infrastructure, and the Cloud Financial Management (CFM) practices that help organizations maximize that value. In addition, we wanted to understand the relationships between duration (i.e., length of time in the cloud), saturation (i.e., percentage of infrastructure in the cloud), the velocity of cloud adoption, and adherence to cloud best practices with financial performance. The study was commissioned by AWS. The analysis and perspectives in this report are solely those of The Hackett Group. This data was collected from organizations that have had applications in the cloud for at least 12 months.

Study respondents included technology executives, infrastructure and operations directors, IT architects, and IT engineers. Respondents were interviewed over the phone, answered questions about their overall cloud migrations, CFM practices, and provided details on up to three individual applications migrated to the cloud. See **Fig. 1** for details on respondents' organization sizes, locations, and industries.

FIG. 1 Survey respondent demographics



Source: Cloud Services Study, The Hackett Group, 2022

The first report, "The Business Value of Migration to Amazon Web Services," revealed that migrating on-premises infrastructure to AWS helped companies achieve quantifiable business value in the areas of resiliency, agility, cost savings, and staff productivity. These include 20% technology infrastructure cost savings, 43% faster time to market, 66% increase in staff productivity, and 45% decrease in security incidents. For comparison purposes, the report also showed the achievement of the study's top performers, designated based on their weighted-average score across 22 key performance indicators (KPIs), and how they compared to the improvements for overall respondents. (See "Appendix" for details.)

The second report, "Cloud Financial Management Maximizes Business Value on Amazon Web Services," investigated the correlation between CFM practice adoption and performance. This report revealed CFM best practices that many top-performing enterprises adopt to achieve better business outcomes. These include planning and forecasting best practices that led to a 35% increase in cloud spend forecast accuracy; and cost optimization best practices that led to 35% greater savings on cloud costs. To provide maximum contrast, the analysis compared the actions of top performers to non-top performers (referred to as the "peer group," defined as all respondents excluding top performers).

This third report analyzes the relationship between publicly available financial performance and the results from Hackett's Cloud Services Study.

INTRODUCTION

It is well understood that cloud can help companies reduce infrastructure technology costs and increase agility to innovate faster. This study utilized several statistical methodologies, including pre-post intervention, year-over-year (YoY) post-significance, and interrupted time series, to quantify the broader impacts that cloud adoption has on financial performance metrics.[2,3,4] The analysis of the study participants' financial performance and cloud migration results revealed strong relationships among significantly improved financial performance and the velocity of cloud adoption, duration in the cloud, and overall cloud saturation. Additionally, the analysis compared top performers to the peer group and cross-industry performance, and examined cloud migration and cloud management best practices associated with improved financial performance.

Financial performance can be impacted by macroeconomic conditions, microeconomic factors at individual companies, the internal and geopolitical landscapes, competition, leadership, execution, etc.[5]

Technology is one of these factors, but digital transformation has changed the role of technology, where it is no longer just a cost center. It is the engine of the business and cloud is the supercharger.

Hackett's Cloud Services Study showed that organizations with workloads on AWS achieved an annualized average 4.2X better financial performance across EBITDA, EV-to-sales, revenue per employee, and selling, general and administrative (SG&A) as a percentage of revenue than companies in comparable major indices.

The following are four significant factors that are strongly related to financial performance:

- Cloud duration
- Cloud saturation
- Velocity of cloud adoption
- Adhering to cloud management best practices

[2] Pre-post Intervention: A before-and-after method of analysis that measures outcomes in a group of participants before introducing an intervention, and then again afterward.

[3] Year-over-year post-significance: A method of statistical analysis involving the annualized YoY change and statistical significance of that change.

[4] Interrupted time series: A method of statistical analysis involving tracking a long-term period before and after a point of intervention to assess the intervention's effects.

[5] See "Appendix" for comparison of Cloud Services Study participant financial performance to market indices.

CLOUD DURATION ANALYSIS OVERVIEW

To analyze the relationship of duration in the cloud to financial performance, we separated duration into three groups: One to three years, three to six years, and greater than six years, and compared pre-cloud migration financial performance to post-cloud migration (i.e., the beginning of cloud migration) financial performance.

EBITDA and cloud duration

First, let's look at earnings before interest, taxes, depreciation, and amortization (EBITDA). EBITDA is commonly cited in financial analysis to measure profit trends, and to compare company and industry average performance.

Surveyed companies, further along in their cloud journeys, posted higher EBITDA growth YoY when compared to companies that had been in the cloud for shorter durations. Most significantly, the peak velocity of the rate of EBITDA growth occurs between years three and four, where we see a three-fold increase in the rate of growth **(Fig. 2)**.

FIG. 2 Cloud duration and EBITDA performance

Financial metric	Cloud duration (years since beginning of cloud migration)	Year-over-year percent change
EBITDA	1 to 3	1.8%
	3 to 6	5.4%
	6+	7.1%

Source: Cloud Services Study, The Hackett Group, 2022

Generally, due to how cloud costs are accounted for, one would hypothesize that migrating to the cloud would reduce EBITDA. However, when looking beyond simple costs, the data reveals the opposite. What a simple cost comparison does not consider are the benefits of throughput, efficiency, value generated, time to market, security, etc., of moving workloads to the cloud (see The Hackett Group's "The Business Value of Migration to Amazon Web Services"). Our data shows that the longer a company is in the cloud, the greater the value it could realize due to these benefits. For example, our data shows that companies that have been in the cloud for over six years have an approximate annualized EBITDA growth rate of 7.1%.

EV and cloud duration

Next, let's look at EV. EV, a measure of a company's total value (i.e., market capitalization - cash + debt), increased YoY after respondents migrated to the cloud. As duration in the cloud increases, EV also increases, with the greatest increase occurring between years two and three. Companies that migrated to the cloud for more than six years experienced an approximate annualized growth of 12.2%, or 73.2% over six years **(Fig. 3)**.

FIG. 3 Cloud duration and EV performance

Financial metric	Cloud duration (years since beginning of cloud migration)	Year-over-year percent change
Enterprise value	1 to 3	5.4%
	3 to 6	8.3%
	6+	12.2%

Source: Cloud Services Study, The Hackett Group, 2022

This trend could be an important signal to investors as they look at the various EV/financial metric ratios. This potential signal could be an important relationship for value investors, acquisitive companies, or private equity companies.

One ratio to consider is EV-to-sales, where a higher ratio could be an indicator of significant future growth, something we would expect to see as companies accelerate their digital transformations.

Revenue per employee and cloud duration

Another metric we looked at was the average revenue per employee **(Fig. 4)**. Revenue per employee increased YoY after respondents migrated to the cloud. As duration in the cloud increased, revenue per employee also increased, with the greatest increase again occurring around year three. Companies that migrated to the cloud six years ago experienced an approximate revenue per employee annual growth of 13.8% or 82.8% over the six years.

FIG. 4 Cloud duration and revenue per employee performance

Financial metric	Cloud duration (years since beginning of cloud migration)	Year-over-year percent change
Revenue per employee	1 to 3	7.1%
	3 to 6	11.3%
	6+	13.8%

Source: Cloud Services Study, The Hackett Group, 2022

Additionally, when we looked at where employees were spending their time, we found that they were driving digital transformation. The Hackett Group's Cloud Services Study found that the number of employees across the entire enterprise assigned to strategic initiatives increased by 3% for each year in the cloud, which leads to greater delivery of value, including both savings and revenue.

The cloud is the catalyst for digital transformation. As companies increase the maturity of their cloud operations, it allows for three things: 1) Increased allocation of technology resources to business value-added activities; 2) Increased efficiency of business resources; and 3) Increased value delivered by business resources (see The Hackett Group's "The Business Value of Migration to Amazon Web Services").

CLOUD SATURATION ANALYSIS OVERVIEW

To analyze the relationship of cloud saturation to financial performance, we separated saturation into four groups: ≤ 25%, 26% to 50%, 51% to 75%, and 76% to 100% in the cloud, and compared YoY financial performance post- to pre-cloud migration.

EBITDA and cloud saturation

The financial metric that has the most positive relationship to the level of cloud saturation is EBITDA. Compared to pre-cloud migration EBITDA growth, annualized YoY is significantly higher for every level of cloud saturation (i.e., the average increase in EBITDA growth for companies that have been in the cloud for at least 12 months at all levels of cloud saturation was 4.6% per year). Companies that are at 75%+ saturation have the highest YoY EBITDA growth at 9.2% **(Fig. 5)**.

FIG. 5 Cloud saturation and EBITDA performance

Financial metric	Cloud saturation	Year-over-year percent change
EBITDA	≤ 25%	3.9%
	26% to 50%	3.9%
	51% to 75%	4.1%
	76% to 100%	9.2%

Source: Cloud Services Study, The Hackett Group, 2022

Net sales and cloud saturation

EBITDA is not the only financial metric that has a strong relationship with the level of cloud saturation. Compared to pre-cloud migration, annualized YoY net sales also improve overall, and shows significant improvement at > 75% saturation **(Fig. 6)**.

FIG. 6 Cloud saturation and net sales performance

Financial metric	Cloud saturation	Year-over-year percent change
Net sales	≤ 25%	0.8%
	26% to 50%	1.5%
	51% to 75%	0.8%
	76% to 100%	3.9%

Source: Cloud Services Study, The Hackett Group, 2022

SG&A as a percentage of sales and cloud saturation

We also saw a strong relationship between annualized YoY changes in SG&A as a percentage of sales and cloud saturation post-migration, compared to pre-migration. As an increase in saturation is also usually tied to longer durations, we saw an initial increase of SG&A as a percentage of sales when cloud saturation is < 50% **(Fig. 7)**. We expected to see this increase as companies that are nascent in their cloud migration journeys are not only managing their new cloud environments but are also managing their legacy on-premises environments. As time passes and companies increase the cloud usage, they also retire their on-premises workloads and environments, and eliminate potential duplication of costs. Additionally, as companies increase the usage of the cloud, they are learning how to better manage cloud environments, and adopt cloud management best practices.

FIG. 7 Cloud saturation and SG&A as a percentage of sales performance

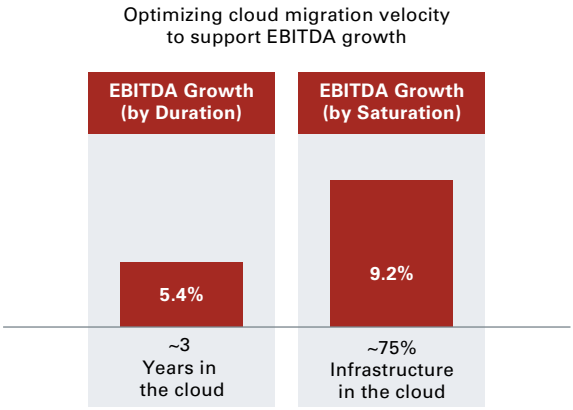
Financial metric	Cloud saturation	Year-over-year percent change
SG&A as a % of sales	≤ 25%	0.7%
	26% to 50%	0.3%
	51% to 75%	-0.3%
	76% to 100%	-1.3%

Source: Cloud Services Study, The Hackett Group, 2022

VELOCITY OF CLOUD ADOPTION ANALYSIS

EBITDA is one measure of a company's profitability. A company with higher EBITDA is generally considered to be more profitable than a company with lower EBITDA. As our study has found, both duration and saturation have a strong relationship with increased EBITDA performance. The key question is identifying the optimal point for annualized YoY EBITDA growth when combining duration and saturation. **Based on our study, the optimal point appears to be between years three and four and at approximately 75% saturation (Fig. 8)**. It was at this point that organizations began to experience an accelerated pace of improvements in financial performance. Achieving this level of saturation in 3 to 4 years is certainly an aggressive goal, but we have found that companies that adopt cloud migration and management best practices, regardless of shorter or longer durations, are able to ultimately realize the benefits of the cloud.

FIG. 8 Cloud duration, saturation and EBITDA performance



Optimal Point: Reaching 75% saturation by year 3 has a strong relationship with EBITDA growth

Source: Cloud Services Study, The Hackett Group, 2022

CLOUD'S VIRTUOUS CYCLE

Economists often speak of virtuous cycles. Virtuous cycles consist of recurring events that increase the beneficial effect of the next event. This particular virtuous cycle stems from companies having lived and learned experience in managing and reaping both the technology and business benefits of the cloud over a period of time. When combined with the commitment to utilizing accelerators (i.e., the cloud), increased value is generated, which, in turn, generates increased profitability, and the ability to further invest in digital transformations, and again, increased value is generated, and so on.

Our analysis demonstrates the relationship between cloud saturation, duration, velocity of adoption, and strong financial performance. Companies that aggressively implement best practices for both cloud migration and cloud management are able to take advantage of this virtuous cycle and reap the performance and cost benefits.

TOP PERFORMER ANALYSIS OVERVIEW

We designated the top decile (10%) of the study population as "top performers" to understand what is possible with the cloud. The top decile was calculated based on the weighted-average score across 22 post-migration KPIs. (See Fig. 12 in the "Appendix" for details.)

Top performers

Top performers posted an approximate 9.4% EBITDA YoY growth post-migration, compared to the peer group which posted an approximate 4.0% EBITDA growth **(Fig. 9)**.

FIG. 9 Peer group and top performer cloud duration and EBITDA performance

		EBITDA growth comparison	
Performance group	**Avg. cloud duration** (years)	**Pre-migration YoY growth**	**Post-migration YoY growth**
Peer group	**4**	**0.0%**	**4.0%**
Top performers	**5**	**1.6%**	**9.4%**

Source: Cloud Services Study, The Hackett Group, 2022

On average, both the peer group and top performers experienced increased annualized YoY EBITDA growth post-cloud migration. However, the growth observed in top performers underscores the value that adopting best practices provides. It is also worth noting that top performers have on average five years in the cloud compared to four years for the peer group. Considering this in combination with our findings regarding the relationship among duration in the cloud, cloud saturation, and EBITDA growth underscores that utilizing best practices, early and often, will establish a foundation for accelerating value realization.

Cloud best practices

As discussed in both Hackett reports, "The Business Value of Migration to Amazon Web Services," and "Cloud Financial Management Maximizes Business Value on Amazon Web Services" adopting cloud best practices is critical to optimizing the value of cloud. As a part of this report, we identified industries that more closely adhered to cloud best practices.

These industries included:

- Banking
- Media and entertainment
- Healthcare
- Telecommunications

These industries significantly outpaced other industries in both adherence to best practices and in greater than average EBITDA growth.

Cloud best practices utilized by these industries included:

- Increased level of planning and forecasting, which improves forecasting accuracy by 35%
- Consistent measurement and accountability of cloud service-level agreements, increasing cloud performance 74%
- Centralized cloud financial operations, which increases infrastructure savings by 38%
- Selecting the optimal migration methodology, particularly refactoring and rearchitecting strategic workloads, increasing innovation by 28% and agility by 60%

A cloud journey

Let's explore one company's cloud journey (i.e., a top performer in Hackett's Cloud Services Study). Several years ago, this company, a large international non-bank financial institution, was facing severe challenges associated with keeping its infrastructure hardware and software up to date, including significant technical debt, high infrastructure maintenance costs, regulatory compliance, and security concerns.

This company spent the next eight to nine months conducting research on cloud migration, management, best practices, and developing cloud strategy. The strategy was focused on delivering business results (e.g., innovation, throughput, quality). Due to the relationship of

trust that IT had with its business partners, the company rapidly moved ahead with the implementation of the strategy and over the course of the next three years moved approximately 80% of its workloads to the cloud.

The implementation was rapid but allowed time for both IT and its business partners to learn and grow; and the results are telling. By developing a migration methodology that focused on rearchitecting and refactoring its strategic workloads, going serverless, and utilizing cloud managed services, IT's operational resource requirements have been reduced by 60%, which the company has generally repurposed to focus on business innovation. During that same period of time, its YoY EBITDA increased by 16%.

Strategic implications

In the modern business landscape, migration to the cloud is an integral enabler of enterprise digital transformation. Without the cloud, companies will lack the value accelerator required by businesses to be agile, innovative, and efficient at scale in highly secure environments. However, just migrating to the cloud is not enough. Developing and updating migration strategies, and understanding how to manage and optimize cloud environments are critical to realizing the business promise of the cloud.

And these benefits are not just notional IT-related benefits. The benefits associated with the cloud contribute to the top and bottom lines, and everything in the middle. Cost, revenue, profitability, and EV are all impacted by how, how quickly, and how much the cloud is utilized. Companies that recognize the strategic nature of the cloud, and manage accordingly, will reap these benefits.

APPENDIX

Cloud Services Study participant's financial performance compared to market indices

Utilizing FactSet, Cloud Services Study participant's financial performance (i.e., YoY growth) was compared to four indices that broadly represent the demographics of this study's participants **(Fig. 10)**. The indices included were the S&P MidCap 400, MSCI Global Stock Market, iShares Global 100, and the S&P International Small Cap.

FIG. 10 Cloud Study participant five-year average annual financial performance improvement comparison to comparable major indices

	EBITDA	Enterprise value to sales	Revenue per employee	SG&A as a % of revenue
Cloud Study participants	5.7%	5.8%	4.0%	-1.0%
S&P MidCap 400	0.3%	4.5%	-0.1%	1.5%
S&P International Small Cap	-0.3%	1.6%	-1.0%	0.5%
MSCI Global Stock Market	0.8%	5.4%	0.5%	1.7%
iShares Global 100	2.8%	7.2%	0.1%	2.4%

Red = < average performance
Orange = average performance
Light green = > average performance
Green = top performance

Source: FactSet and The Hackett Group research

We compared the five-year financial performance of study participants and the performance of the aggregated companies in each index across EBITDA, EV-to-sales, revenue per employee, and SG&A as a percentage of revenue. In fifteen of sixteen metrics (i.e., four metrics x four indices), cloud participants outperformed the performance of each index.

KPIs determining top-performer status

Top-performing organizations in the Cloud Services Study (referred to in this report's text and figures as "top performers") achieved a top-10% (decile) weighted-average score across 22 KPIs, based on their direct responses to survey questions and on calculated metrics.

The KPIs used for this analysis are listed in **Fig. 11**. Each was weighted equally, and scores were based on post-migration values only. Where more than one application is indicated, scores were averaged across all AWS-migrated applications submitted for analysis by respondents.

FIG. 11 KPIs used to determine top performers

Performance indicator category	Performance metric
General performance	Percentage of company/business unit's technology programs and initiatives that achieve anticipated return on investment
	Average forecast accuracy for company/business unit's cloud spend
	Average employee satisfaction rating for the migrated application(s)
	Average customer satisfaction rating for the migrated application(s)
	Change in number of issues related to response time of the application(s)
Cost savings & productivity	IT infrastructure spend as a percentage of current year annual revenue
	Number of virtual machines (VMs) managed per server administrator
	Total terabytes of storage managed per storage administrator
	Percentage of infrastructure staff focused on day-to-day operations activities such as purchasing, repairs, installation, upgrades, testing, and monitoring (versus strategic activities such as capacity planning, budgeting, roadmapping and other activities)
	Migrated application(s) infrastructure spend as a percentage of current year annual revenue
	Percentage of application development team's effort directed toward developing new features and functionality (versus minor enhancements, updates, and break-fixes)
Resiliency/security	Number of critical incidents per billion of current year annual revenue
	Number of outages per billion of current year annual revenue
	Hours of unplanned downtime experienced during 12-month period
	Number of security-related incidents per billion of current year annual revenue
	Mean time to detect or identify security incidents
	Percentage of infrastructure SLAs consistently met
Agility	Average frequency of production releases for the application(s)
	Average time for a production release for the application(s)
	Average time to market for new features for the application(s)
	Length of time to produce actionable insights from when data is made available for the application(s)
	Percentage of projects/applications using agile/DevOps methodologies

Source: Cloud Services Study, The Hackett Group, 2022

Cloud migration methodologies: KPIs

FIG. 12 Cloud migration KPIs and post-migration results by migration methodology

Value category	Key performance indicator	Rehost/replatform			Rearchitect/refactor		
		Before migration	After migration	% change	Before migration	After migration	% change
Staff productivity	Development staff focused on creating new features and functionality (innovation)	50%	64%	28%	50%	67%	34%
	Infrastructure staff focused on infrastructure planning, architecture, orchestration and innovation	49%	53%	8%	50%	60%	20%
Resiliency	Critical infrastructure-related incidents per month*	1.5	0.8	-47%	1.3	0.6	-54%
	Unplanned outages in a 12-month period*	2.1	1.0	-52%	1.3	0.5	-62%
Agility	Time to market for new application features (workdays)	57.8	31.5	-46%	78.9	30.0	-62%
	Time to actionable insight from when application data is made available (hours)	110.0	63.8	-42%	38.0	24.0	-37%

*Per 1,000 connected devices

Source: Cloud Services Study, The Hackett Group, 2022

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Mr. Fuller has over 25 years of management consulting and IT experience, primarily working in financial services, utilities and energy, and consumer product goods. He has had hands-on experience in designing and implementing IT operating models, optimizing cloud migration and operations, aligning IT with its business partners, and in the development of highly efficient and effective IT organizations.

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