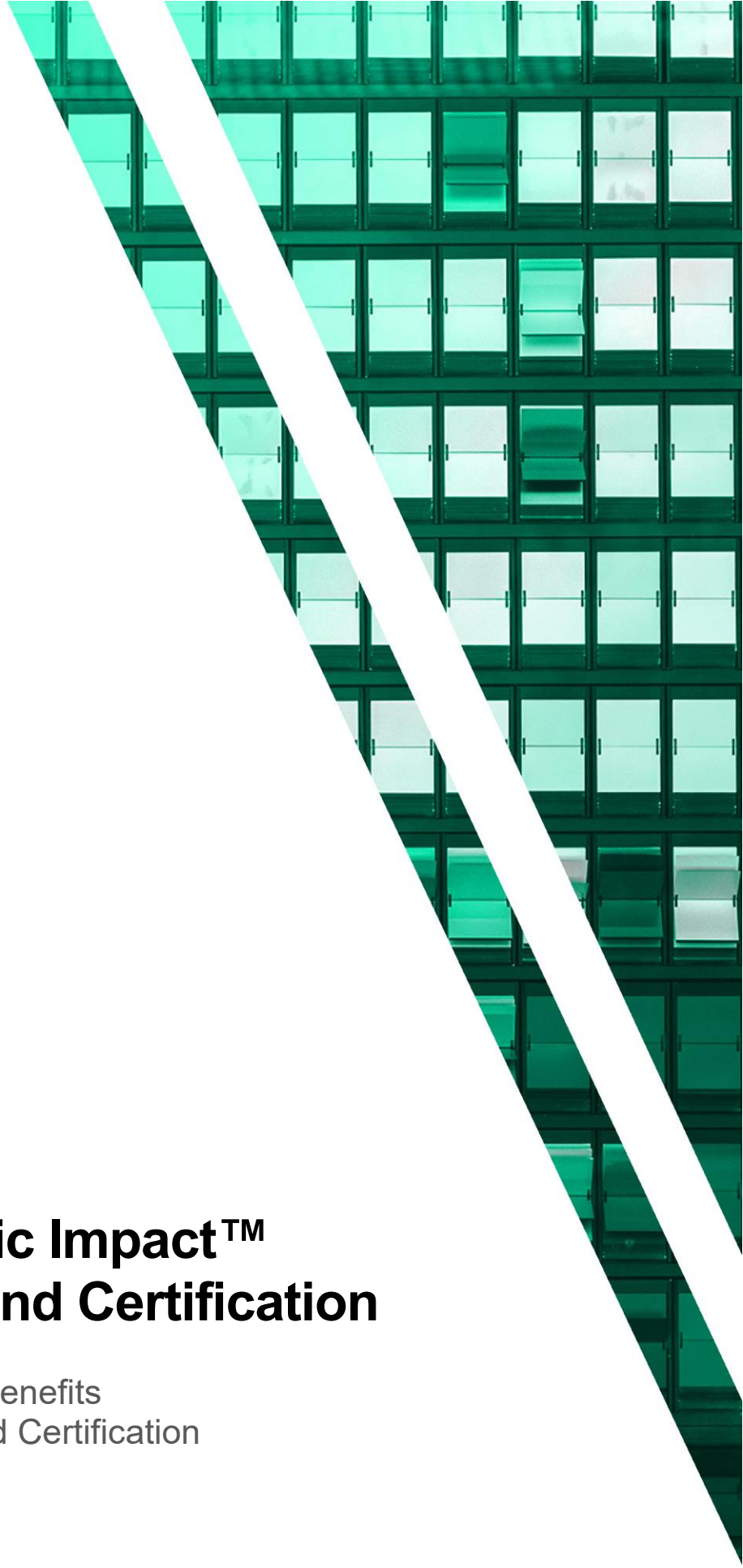
FORRESTER®



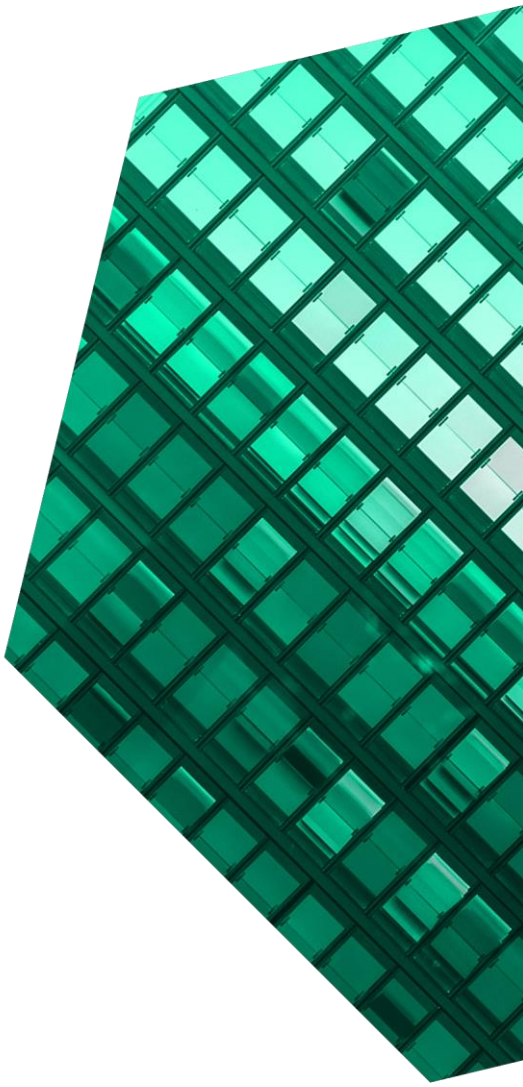
The Total Economic Impact™ Of AWS Training And Certification

Cost Savings And Business Benefits Enabled By AWS Training And Certification

MAY 2022

Table Of Contents

Consulting Team: Veronica Iles
Kara Luk



Executive Summary

As cloud usage grows, companies face a talent shortage. Many technology investments are often framed as a build versus buy analysis. AWS Training and Certification enables companies to build talent in addition to hiring it. Training that enables employees is a critical part of any company's ability to continuously transform and compete in today's business environment.[1]

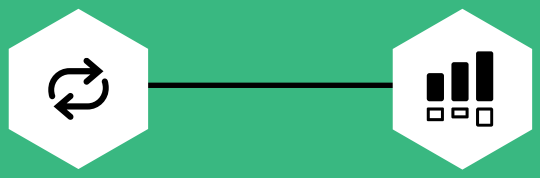
AWS offers learners a path to cloud expertise based on roles or solutions. It also validates cloud expertise with certifications to build credibility and confidence.

AWS commissioned Forrester Consulting to conduct a Total Economic Impact™ (TEI) study and examine the potential return on investment (ROI) enterprises may realize by investing in AWS Training and Certification.[2] The purpose of this study is to provide readers with a framework to evaluate the potential financial impact of AWS Training and Certification.

To better understand the benefits, costs, and risks associated with this investment, Forrester interviewed eight decision-makers at seven enterprise-sized organizations across APJ, AMER, and EMEA (including LATAM and MEA) with experience using AWS Training and Certification. For the purposes of this study, Forrester aggregated the interviewees' experiences and combined the results into a single composite organization.

Prior to investing in AWS Training and Certification, the interviewees' organizations had traditional workforces with limited cloud knowledge or expertise; struggled to hire cloud talent; and had stakeholders who were wary of a cloud migration. With some education available through legacy learning platforms, decision-makers understood they needed to translate legacy skill sets by upskilling existing talent to fill new and growing cloud skills demands and certify individuals as an indicator of skills attainment.

KEY STATISTICS



Return on investment (ROI)
234%*

Net present value (NPV)
$5.83M

** Please note that all references to ROI in this study are strictly related to the value of using the AWS Training and Certification services and do not include the additional benefits of moving to the cloud in general.*

KEY FINDINGS

Quantified benefits. Risk-adjusted present value (PV) quantified benefits from investing in AWS Training and Certification include:

- **Filled 20% to 30% of skilled hire roles by upskilling existing employees.** Through AWS Training and Certification, the interviewees' organizations empowered employees to develop relevant cloud skills and placed those employees in emerging cloud-related roles. By filling open roles with upskilled employees, the organizations avoided costs associated with hiring and the higher salaries that experienced cloud talent demand in the market**.** Over three years and a cumulative total of 213 roles filled by promotion, the avoided hiring is worth more than $5.3 million to the composite organization.

- **Increased retention of learners by 10% to 35%.** Decision-makers in AMER and EMEA noticed that employees who participated in learning with AWS felt increased loyalty towards their organization, higher morale, more engaged, and a sense of ownership, resulting in reduced turnover rates and longer tenure. Over three years, the improved learner retention is worth $815,000 to the composite organization.
- **Increased innovation using cloud technologies by 88%.** The rate of innovation increased for the interviewees' organizations as learners applied theory, gained confidence in their abilities, and shared lessons learned with peers, enabling developers to create a proof of concept (POC) for new features or applications in one week, down from 10 weeks. After three years and a cumulative total of 176 POC projects, the shorter development cycle is worth $986,000 to the composite organization.
- **Decreased learner ramp up time by 20% to 30%, eliminating weeks of onboarding time.** Upskilled employees required time to learn the technical skills, but were much quicker to deliver value given their institutional knowledge. Over three years and with promotions filling a cumulative total of 213 roles, onboarding efficiencies are worth more than $822,000 to the composite organization.
- **Increased application migration rates by 30% to 50%.** Learners migrated applications more efficiently after course completion. From their training, they identified automation possibilities, avoided manual rework, and more easily and quickly overcame challenges. Over three years and a cumulative total of 36 migrated applications, the shorter migration cycle is worth $417,000 to the composite organization.

Unquantified benefits. Benefits not quantified by this study include:

- Cost savings from faster cloud migration due to earlier independence from on-premises infrastructure.
- Improved cloud optimization from better trained decision-makers, IT leaders, architects, developers, and engineers.
- Reduced risk and improved security.
- Higher availability and resiliency.
- More applications and better fit candidates.

Costs. Risk-adjusted PV costs include:

- **Training and Certification fees.** Over three years, the composite organization incurs under $1.2 million in external costs related to the AWS Training and Certification investment.
- **Time costs for learner participation in AWS Training and Certification.** Learner time dedicated to participating in training courses, finishing labs, and studying for and taking exams are considered opportunity costs to the composite organization. Over three years, learners' labor costs total under $1.3 million for the composite organization.
- **Program setup and management.** The interviewees' organizations required administrative support for AWS Learning Needs Analysis and ongoing progress tracking and program management. Over three years, these efforts total less than $38,000 of internal labor costs for the composite organization.

The decision-maker interviews and financial analysis found that a composite organization experiences benefits of $8.32 million over three years versus costs of $2.49 million, adding up to a net present value (NPV) of $5.83 million and an ROI of 234%*.

**Please note that all references to ROI in this study are strictly related to the value of using the AWS Training and Certification services and do not include the additional benefits of moving to the cloud in general.*

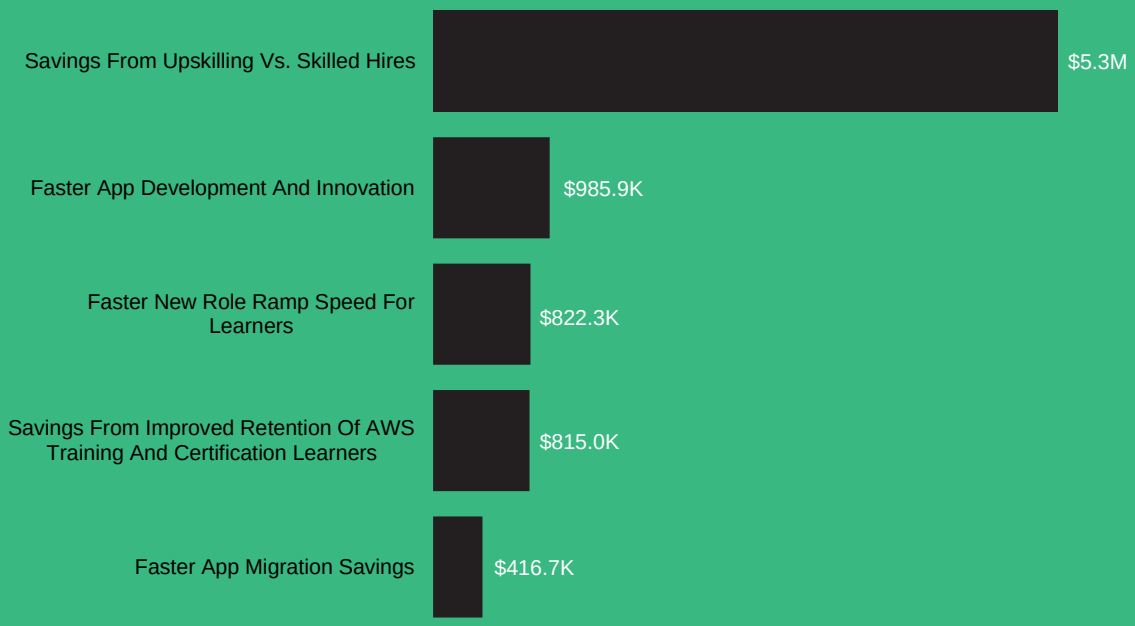
ROI
234%

BENEFITS PV
$8.32M

NPV
$5.83M

PAYBACK
<6 months

Benefits (Three-Year)



“We have to make sure that our people are not only the best and brightest, but that they’re also the most relevant. Automation and innovation come from good strong teams, good attitudes, and the right skills. The easier you make it for people to be able to do their jobs, the more time they have on their hands to explore new opportunities.”

— VP of infrastructure and operations, public sector

TEI FRAMEWORK AND METHODOLOGY

From the information provided in the interviews, Forrester constructed a Total Economic Impact™ framework for those organizations considering an investment in AWS Training and Certification.

The objective of the framework is to identify the cost, benefit, flexibility, and risk factors that affect the investment decision. Forrester took a multistep approach to evaluate the impact that AWS Training and Certification can have on an organization.

DISCLOSURES

Readers should be aware of the following:

This study is commissioned by AWS and delivered by Forrester Consulting. It is not meant to be used as a competitive analysis.

Forrester makes no assumptions as to the potential ROI that other organizations will receive. Forrester strongly advises that readers use their own estimates within the framework provided in the study to determine the appropriateness of an investment in Training and Certification.

AWS reviewed and provided feedback to Forrester, but Forrester maintains editorial control over the study and its findings and does not accept changes to the study that contradict Forrester's findings or obscure the meaning of the study.

AWS provided the customer names for the interviews but did not participate in the interviews.

The AWS Training And Certification Customer Journey

Drivers leading to the AWS Training And Certification investment

Interviewed Decision-Makers

Interviewee	Industry	Region	Size
Expert in IT change management	Financial services	APJ	$1 billion revenue 12,000 employees
General manager, group IT	Professional services	APJ	$8.3 billion revenue 54,000 employees
Program manager	Financial services	AMER headquarters, global operations	$21 billion revenue 52,000 employees
Skills analyst	Financial services	AMER	$6.5 billion revenue 22,500 employees
Head of enterprise and group projects	Financial services	EMEA	$5.1 billion revenue 5,400 employees
Director of business and technology solutions	Real estate	EMEA	$5.5 billion revenue 8,500 employees
Learning and development manager	Public sector	EMEA headquarters, global operations	$4.3 billion revenue 32,000 employees
VP of infrastructure and operations			

KEY CHALLENGES

Before investing in AWS Training and Certification, the interviewees noted their organizations used traditional on-premises infrastructures and leveraged legacy-trained support teams for their management. Each of the interviewees' organizations were in the early stages of their cloud transformation journeys. Their goals in using cloud technologies were to increase their rate of experimentation and innovation to deliver value to their customers at a faster rate. However, in adopting cloud, the company decision-makers recognized their dearth in cloud-trained individuals. They considered two solutions: Either 1) hire individuals with cloud skills or 2) train existing employees on cloud skills.

Many of the interviewed decision-makers established learning and development environments at their organizations that offered cloud education. However, these offerings were informal online learning marketplaces with a mix of external or internal general training providers.

The interviewees noted how their organizations struggled with common challenges, including:

- **Their traditional workforce lacked cloud skills and competencies.** Internally conducted surveys intended to determine baseline competencies identified that there were only a few existing employees knowledgeable on the cloud and that their level of expertise was minimal. Decision-makers were concerned that, without knowledge, experience, or qualifications among existing talent, cloud migration would be difficult, if not impossible.

- **Low supply of cloud-savvy talent led to high demand and above-market salaries.** Decision-makers found that hiring cloud talent was challenging because it is in high demand and, therefore, very expensive. This high demand is painfully obvious on job search sites like LinkedIn.com, which currently lists 378,000 "cloud computing" jobs, and Indeed.com, posting 58,000 "cloud computing" jobs.[4] Decision-makers were faced with a choice: Hire new employees with cloud skills or invest in the existing team to develop new skills.
- **An insufficient understanding of cloud impeded cloud adoption and caused delays.** Some stakeholders were reticent to adopt public cloud out of concern that it was less secure. The program manager at a financial services organization shared, "We were moving to cloud and there were lots of people who had no previous cloud knowledge and it [caused] a reluctance because they were nervous that it wasn't safe." Changing the culture by educating their tech leaders and the entire organization was necessary to embrace migration ambitions.
- **University programs lacked cloud training, creating the cloud skills gap.** Forrester analyst, Tracy Woo writes: "A very small number of universities offer official cloud programs or courses that leverage cloud technologies — only about a hundred US universities offer cloud courses, with each providing only a limited selection. Computer science or information systems degrees often lack a focus on cloud experience around basic development."[5] The director of business and technology solutions at a real estate company echoed this sentiment: "There is a real skills problem in the cloud. This is due to the fact that university courses are not adapted to these new needs, to these new technologies. This presupposes that in university engineering courses, they have faculty that is already acculturated to the cloud."
- **Increasing demand for cloud transformation required more skilled resources**. The interviewees from the public sector organization noted their organization had success in making small cloud deployments. Subsequently, demand was rising across the organization for additional cloud capabilities. However, with only a few cloud-capable resources, the organization was unable to scale to these other departments. The VP of infrastructure and operations said: "Once more teams started to look at cloud, there was a big maturity curve in getting not just the infrastructure team that support the delivery and operational areas of cloud, but also the development teams, to be adequately trained as well. So, our biggest challenge was scalability [of skills]."

"Companies today have no choice but to invest in the training of their employees. The successes are simple. We no longer have technological obsolescence; the security of the information system has increased; and we design solutions that are significantly more reliable, resilient, and flexible."

Director of business and technology solutions, real estate

WHY AWS?

The limited talent pool required interviewees and their organizations to use alternative measures, such as training the existing workforce. Although there were many solutions for training and cloud skills, these decision-makers chose AWS for training and certification because:

- **AWS is the master of its platform.** When interviewees were evaluating training options, they identified that the best way to educate their workforce on AWS was to use AWS Training and Certification. In doing so, they had access to AWS product experts who were well-informed on AWS products. The director of business and technology solutions at a real estate company said, “We chose AWS because we use the AWS platform, and we wanted a professional training course with experts who master this platform. “
- **They had a strong relationship with AWS.** Many customers had a history of good experiences working with the AWS account teams. The program manager at a financial services company said: “We’d had a lot of positive results working with the AWS accounts teams, and that opened the door to have a conversation about the AWS Training and Certification offering. [The company] has always had a good relationship with AWS, and there’s always been a lot of support from AWS.”
- **AWS used a data-driven approach.** AWS would tailor learning plans for each organization based on the AWS Learning Needs Analysis. It focused on areas of development that best supported business objectives. The AWS representative helped identify specific roles needed in a cloud first environment and charted paths for learners to get there.

“We had our resident trainer speak with our subject matter experts, learn about how we do things with AWS, and then he incorporated that back into the courses he was teaching. We certainly felt like people who were going to those courses were very positive about that experience because they actually were able to bring what they learned back into their job.”

Program manager, financial services

INVESTMENT OBJECTIVES

The interviewees' organizations searched for a solution that could:

- **Upskill and reskill existing talent to fill new and growing cloud skills demands.** The interviewees highlighted the number one goal of their organizations' investment in AWS Training and Certification was to upskill their existing workforce to help support their cloud investments.
- **Drive certifications as an indicator of skills attainment, cloud knowledge, and employee recognition.** Interviewees noted that certifications were a key objective, especially early in the cloud journey. Interviewee sentiment was that the higher the number of certified employees, the greater success for the organizations' cloud migration and transformational initiatives.
- **Follow the Skills Guild plan.** Interviewees noted that five of the seven organizations in this study participated in the AWS Skills Guild, which is a formal training framework and skills enablement program AWS offers.[6] As part of the Skills Guild, the interviewees' organizations received a tailored plan designed around each organization's initiatives, skills and certification requirements, and business goals.

"Our goal is to develop talent through the proactive identification of knowledge, the development of the defined learning plan, and the evolution of the agile principles to give attention to the current and future needs of the organization with the speed and quality required."

Skills analyst, financial services

"We partnered with AWS to run a Skills Guild program. We branded it Learning To Work, and one of the goals for that program is to get as many people as possible certified in either practitioner, associate, professional, or specialty levels. Now, we're measuring the number of people who get certified month-on-month."

Learning and development manager , public sector

COMPOSITE ORGANIZATION

Based on the interviews, Forrester constructed a TEI framework, a composite company, and a ROI analysis that illustrates the areas financially affected. The composite organization is representative of the eight decision-makers from seven organizations that Forrester interviewed and is used to present the aggregate financial analysis in the next section. Forrester uses a composite organization to create a singular consolidated output based on findings from organizations that may have varying use cases and KPIs. The composite organization has the following characteristics:

Description of composite. The global, multibillion-dollar organization provides services to consumers. The organization has 20,000 employees distributed 50% in AMER, 30% in APJ, and 20% in EMEA. The organization has historically operated with traditional on-premises infrastructure and began the cloud journey within the last year. It has adopted a hybrid cloud strategy and intends to be operating 100% in the cloud in five years.

Leaders at the composite organization realize quickly that there is a skills gap — their traditional workforce has little to no understanding of the cloud. Investments in workforce preparation are a key imperative to ensure the success of the cloud transformation. Evaluation of the hiring environment reveals high demand of cloud skills and low supply, creating a dilemma where hiring cloud resources is challenging and expensive.

Deployment characteristics. The composite completes an AWS Learning Needs Analysis and creates a data-driven approach to learning. The learning plan starts small with its training program targeted at 150 learners in Year 1, 250 in Year 2, and 400 in Year 3. Training is offered to roles beyond IT to the 1,000 employees that may benefit from cloud training.

Certification goals. The composite sets goals to have 15% of learners receive associate-level or foundational certifications each year and that 5% receive professional-level or specialty-level certifications.

Key assumptions

- **$5 billion revenue**
- **20,000 total employees**
- **1,000 cloud-related employees**

“We have carried out training for IT people, but also for marketing, legal, and purchasing, so that everyone can understand at their level what the cloud is and how can the cloud help improve business.”

Director of business and technology solutions, real estate

Forrester’s Perspective: The Employees That You Want Working For You Want To Grow

Purpose workers, or employees who are satisfied and secure in their jobs; inspired and enthusiastic about the work they do; and generally burst with energy, enthusiasm, and creativity, spend more time than their colleagues trying to improve their work performance through learning and deliberate development.[7]

Analysis Of Benefits

Quantified benefit data as applied to the composite

Total Benefits

Ref.	Benefit	Year 1	Year 2	Year 3	Total	Present Value
Atr	Savings from upskilling vs. skilled hires	$934,748	$1,962,971	$3,738,992	$6,636,711	$5,281,221
Btr	Savings from improved retention of AWS TRAINING AND CERTIFICATION learners	$76,338	$254,459	$712,486	$1,043,283	$814,996
Ctr	Faster app development and innovation	$285,012	$393,588	$534,398	$1,212,998	$985,882
Dtr	Faster new role ramp speed for learners	$86,346	$271,990	$690,768	$1,049,104	$822,266
Etr	Faster app migration savings	$60,653	$161,741	$303,264	$525,658	$416,656
	Total benefits (risk-adjusted)	$1,443,097	$3,044,749	$5,979,908	$10,467,753	$8,321,021

SAVINGS FROM UPSKILLING VS. SKILLED HIRES

Evidence and data. Interviewees noted their organizations experienced the most significant quantified benefit in the financial impact of upskilling employees instead of hiring externally or supplementing with external consultancy services. In general, most interviewees noted their organizations preferred to promote and upskill internally, especially if tangential skill sets existed within the existing workforce. With the help of AWS, interviewees' organizations empowered employees to develop relevant cloud skills and placed those employees in emerging cloud-related roles.

When the organizations filled open roles with current upskilled employees, they avoided costs associated with hiring (e.g., external recruiters, internal HR team, career events, etc.) and avoided the cost of offering competitive salaries that an experienced cloud individual would demand.

Interviewee Voices: Evolving Hiring Practice Preferences

"Within [the company], there is a lot of focus on career mobility. We look internally to fill as many posts as possible, depending on skill sets."

— Program manager, financial services

"We knew [the cloud] is a specialized area and we knew there's a lack of people with [cloud] skill sets. Because of this, we knew we couldn't just hire the way we normally hire; we would have to do something different. So, we leveraged AWS Training and Certification."

— Expert in IT change management, financial services

"Our mindset around hiring practices has changed significantly as a result of the learning and development. If you look back to when we first started migrating to cloud, we would look to the street for skills and talent to hire. What we found was that we could develop our own internal people far faster than hiring a person from outside."

— VP of infrastructure and operations, public sector

Modeling and assumptions. Forrester assumes the following for the composite organization:

- Hiring and recruiting costs for an externally skilled hire average $4,000.
- The global blended annual cost of an externally skilled hire is $117,600.
- The global blended annual cost of an upskilled internal employee is $83,133.
- The composite organization has 150 unique learners in Year 1, 250 in Year 2, and 400 in Year 3.
- After participating in training, 20% of unique learners apply their skills to open positions that would otherwise be filled externally in Year 1, 25% in Year 2, and 30% in Year 3. This equates to 30 headcounts in Year 1, 63 in Year 2, and 120 in Year 3. The ability to fill open roles with upskilled employees increases over the three-year period as the culture of learning creates a more cloud-educated workforce and confidence in upskilled and reskilled employees grows from proven successes.
- The value derived from upskilling existing employees rather than hiring is 90% attributed to AWS Training and Certification. This attribution is high to represent that, without AWS Training and Certification, the composite organization isn't able to upskill its existing workforce enough to satisfy cloud requirements.

Risks. Forrester recognizes that these results may not be representative of all experiences, and the benefit will vary between organizations depending on:

- Actual hiring and recruiting costs. These may be higher for certain regions, skill sets, and recruiting techniques.
- Actual burdened costs of both internal and external hires. These are based on location, industry, level of experience, and job role.
- The actual rate at which an organization fills open roles with upskilled internal employees, which varies by sector. In sectors where there's less talent to lean on, the demand for tech usage is high and the surrounding external talent pool is low. For example, for a highly tech-savvy financial services firm that number may lean more towards 40% trained and 60% hired. For a place where tech skills are low or external talent is higher, that number may lean towards 20% trained and 80% hired.
- This benefit could apply similarly for outsourced skilled labor, rather than skilled hires. In the case of outsourced labor, the difference between an internal resource and an outsourced resource may be even greater than modeled here.
- The financial model assumes that there is a unique cohort of learners each year. However, it is reasonable that one employee might participate in multiple learning courses over several years, and there would be carry over benefits in subsequent years.
- The financial model considers whole years of impact. It should be noted that the 63 roles filled with upskilled resources will not be filled on Day 1 of Year 2 and, therefore, some of the benefit value may be recognized in subsequent years. A more granular calculation might consider at which point in the year the new hire is avoided and allocate the impact appropriately over a rolling twelve-month period.
- **Results.** To account for these risks, Forrester adjusted this benefit downward by 10%, yielding a three-year, risk-adjusted total PV (discounted at 10%) of $5.28 million.[8]

Over three years, upskilled employees fill **20% to 30%** of skilled hire positions

Savings From Upskilling Vs. Skilled Hires					
Ref.	**Metric**	**Source**	**Year 1**	**Year 2**	**Year 3**
A1	Hiring and recruiting costs per new hire	Assumption	$4,000	$4,000	$4,000
A2	Blended annual cost of skilled hire	Composite	$117,600	$117,600	$117,600
A3	Blended annual cost of upskilled internal employee	Composite	$83,133	$83,133	$83,133
A4	Marginal savings for using upskilled employees vs. hiring skilled hire	A1+A2-A3	$38,467	$38,467	$38,467
A5	Total AWS training and certification learners	Composite	150	250	400
A6	Percent of learners replacing skilled hires	Interviews	20%	25%	30%
A7	Number of roles filled by upskilling internal employees	A5*A6	30	63	120
A8	Attribution to AWS TRAINING AND CERTIFICATION	Assumption	90%	90%	90%
At	Savings from upskilling vs. skilled hire	A4*A7*A8	$1,038,609	$2,181,079	$4,154,436
	Risk adjustment	↓10%			
Atr	Savings from upskilling vs. skilled hire (risk-adjusted)		$934,748	$1,962,971	$3,738,992
	Three-year total: $6,636,712			**Three-year present value: $5,281,221**	

SAVINGS FROM IMPROVED RETENTION OF AWS TRAINING AND CERTIFICATION LEARNERS

Evidence and data. The interviewed decision-makers realized that newly trained and certified employees might be quickly poached for their new in-demand skill sets and certifications. To prevent attrition, decision-makers identified that creating a culture of learning, focusing on employee experience, and providing further career-advancing opportunities to employees were key to retention.

The learning and development manager at a public sector company said: “We want to invest in our people. As we continue to invest in our engineers and developers and our business services team, they’ll see that we value them, that we want them to stay with the company, and we want to help them develop. That’s one of the reasons why we continue to offer as many learning opportunities as we can and support their development — whether it’s upskilling or cross-skilling, we want to be sure that they know they can grow within the company.”

Decision-makers in AMER and EMEA noticed that employees that participated in learning with AWS felt increased loyalty towards their organization, along with higher morale, engagement, and sense of ownership, resulting in reduced turnover rates and longer tenure.

The program manager at a financial services organization said: “Certainly, for the US employees, training and certification for our associates has made them more likely to stay because they are upskilled and they have ensured mobility and promotion. It’s been an overall positive to retaining our employees.”

However, one interviewee in APJ and one in Latin America noted that turnover rates for their learners were higher, given the regions’ incredibly high demand for the skill sets AWS Training and Certification enables.

Interviewee Voices: Creating A Culture Of Learning

“Upskilling has become an imperative to maintain relevance in the market, and we consider upskilling as an investment because it increases morale, loyalty, and motivation; improves employee engagement; and creates a sense of ownership. We utilize existing knowledge, and we cultivate a healthy culture.”

— Skills analyst, financial services

“[Training has impacted] not only retention, but also the enjoyment and satisfaction with the work that they’re doing. If you invest in the resources that you have, you are really helping them to upskill, continue their journey, and maintain their relevancy in technology. Culturally, that’s a huge, huge plus.”

— VP of infrastructure and operations, public sector

“Today, we have employees who have gone from a mode where they supported infrastructure to a mode where they become innovative leaders.”

— Director of business and technology solutions, real estate

Modeling and assumptions. Forrester assumes the following for the composite organization:

- The composite organization has 150 unique learners in Year 1, 250 in Year 2, and 400 in Year 3.
- The average global turnover rate for all employees is 35%.
- The average tenure of an employee at the composite organization is 4.2 years.
- Leaners who participate in AWS Training and Certification have an average increase in tenure of 10% in Year 1, 20% in Year 2, and 35% in Year 3. This compounds impact over three years

as investments in company culture have a rippling and growing effect.

- The marginal savings of $38,467 is the difference between the blended annual cost of a skilled hire plus hiring and recruiting costs less the blended annual cost of upskilled internal employee.
- Forrester attributes 10% of this value to the AWS Training and Certification investment. Countless factors contribute to the retention rates of the employees. Additionally, the attribution considers the difference in retention behavior recognized between global markets.

Improvement to learner retention after AWS Training and Certification:

10% to 35%

Risks. Forrester recognizes that these results may not be representative of all experiences, and the benefit will vary between organizations depending on:

- The region where employees are located and the demand of skill sets in their respective markets.
- Actual marginal savings related to retention, depending on which regions employees are located.
- The ability of the organization to create a culture that keeps employees engaged and happy after they participate in AWS Training and Certification. Newly trained staff may leave the company for higher paid positions, increasing churn. Organizations might mitigate this by starting with highly motivated employees who communicate well, enjoy learning about new technologies, and prefer their day-to-day tasks to evolve over time.[9]

Results. To account for these risks, Forrester adjusted this benefit downward by 10%, yielding a three-year, risk-adjusted total PV of $815,000.

Savings From Improved Retention Of AWS Training And Certification Learners

Ref.	Metric	Source	Year 1	Year 2	Year 3
B1	Number of AWS Training and Certification learners	Composite	150	250	400
B2	Annual turnover rate	Composite	35%	35%	35%
B3	Average tenure of employees before AWS Training and Certification (years)	Industry data	4.2	4.2	4.2
B4	Improvement to tenure for AWS learners	Interviews	10%	20%	35%
B5	Additional years with the company for AWS learners (rounded)	B3*B4	0.42	0.84	1.47
B6	Marginal savings for using upskilled employees vs. hiring skilled hire	A4	$38,467	$38,467	$38,467
B7	Avoided costs of replacing learners with skilled hires	B1*B2*B5*B6	$848,197	$2,827,325	$7,916,509
B8	Attribution to AWS Training and Certification	Assumption	10%	10%	10%
Bt	Savings from improved retention of AWS Training and Certification learners	B7*B8	$84,820	$282,732	$791,651
	Risk adjustment	↓10%			
Btr	Savings from improved retention of AWS Training and Certification learners (risk-adjusted)		$76,338	$254,459	$712,486
	Three-year total: $1,043,283			**Three-year present value: $814,996**	

FASTER APP DEVELOPMENT AND INNOVATION

Evidence and data. Decision-makers noted that, as learning programs progressed and the count of learners grew, learners became more comfortable applying theories through hands-on application. The skills analyst at a financial services organization shared: “After training, [learners] have more knowledge and tools with which to innovate. It’s getting easier for them to innovate and do new things after training.”

The rate of innovation increased for the interviewees’ organizations as learners applied theory, gained confidence in their abilities, and shared their lessons with peers. The program manager at a financial services organization noted this waterfall effect, saying: “We had a goal of getting 10% of our associates cloud certified. We had looked at other companies, and 10% is seen as a tipping point that has a waterfall effect in terms of their skills and then transferring skills and essentially getting at least some foundation of cloud in an enterprise.”

As a result, interviewees saw an uptick in efficiency, more experimentation, and a lift in applications developed. Developers learned new techniques, applied automations, and shared their learnings with peers, accelerating the time to development for applications and new releases.

Modeling and assumptions. Forrester assumes the following for the composite organization:

- The composite innovates rapidly in the first three years by enabling learners to “play” with their new skills. In Year 1, developers create four new features or applications a month. The team of learners develops 48 applications in Year 1, 58 in Year 2, and 70 in Year 3.
- Before developing AWS skill sets with Training and Certification, an application POC takes 10 weeks of developer time.

Interviewee Voices: Applying Lessons To Real Life Innovation

“The more knowledgeable our engineers and developers are in using AWS technologies and tools, the more efficient they can be. And the more efficient they are, the more work gets done. The more work gets done, the faster we release products, services, and support the products and services from the back end. So, if we have more knowledgeable people, it just means we have more effective products.”

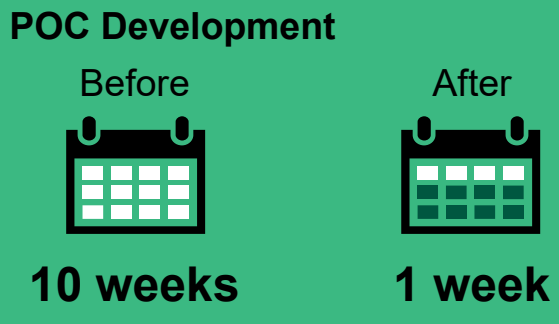
— Learning and development manager, public sector

“As we have groups skilling up, they inevitably start to train other groups or they become a center where those who are trained can start to share their knowledge with others.”

— Program manager, financial services

“We gained about 30% or even 40% in terms of project execution. To build a project, we go about twice as fast today. In addition, our solutions are much more reliable in production.”

— Director of business and technology solutions, real estate



- As learners apply their new skills and practice theories, the speed to develop a POC increases by 70% in Year 1, 80% in Year 2, and 88% in Year 3, essentially allowing developers to create a POC in a matter of days, rather than weeks.
- The blended weekly cost of developers and architects is $1,885.
- Forrester attributes 50% of this benefit value directly to the AWS Training and Certification investment. Other factors include ease of access to services, developers' prior understanding of the environment, development of formal IT processes, and access to sandboxes and development tools.

Risks. Forrester recognizes that these results may not be representative of all experiences, and the benefit will vary between organizations depending on:

- The rate of innovation, which will vary by organization, developer capacity, and prioritization on new feature development. The definition of application or feature release will vary by organization and readers should adjust C1 and C2 to reflect their organization's delivery metrics.
- Baseline time required to develop an application before AWS Training and Certification. This will vary by software development practices, definition of POC, and innovation appetite.
- Increased ability to innovate after AWS Training and Certification, which is affected by innovation culture and the actual rate at which learning value compounds when applied.
- Concentration on skill development. By starting with low stakes innovation efforts, organizations can concentrate on skill development. If decision-makers are focused on establishing a business case, start with a new application with large business impact and a definitive start and end to the project.

Results. To account for these risks, Forrester adjusted this benefit downward by 10%, yielding a three-year, risk-adjusted total PV of $986,000.

Faster App Development And Innovation

Ref.	Metric	Source	Year 1	Year 2	Year 3
C1	Number of new applications developed	Interviews	48	58	70
C2	Weeks to create one POC before AWS T&C	Interviews	10	10	10
C3	Increased ability to innovate after AWS T&C	Interviews	70%	80%	88%
C4	Weeks to create one POC after AWS T&C (rounded)	C2*(1-C3)	3	2	1
C5	Blended weekly cost of developers and architects	$98,000/52 weeks	$1,885	$1,885	$1,885
C6	Attribution to AWS T&C	Assumption	50%	50%	50%
Ct	Faster app development and innovation	C1*(C2-C4) *C5*C6	$316,680	$437,320	$593,775
	Risk adjustment	↓10%			
Ctr	Faster app development and innovation (risk-adjusted)		$285,012	$393,588	$534,398
	Three-year total: $1,212,998			**Three-year present value: $985,882**	

FASTER NEW ROLE RAMP SPEED FOR LEARNERS

Evidence and data. Employees need to have the right skills and business knowledge to perform their jobs and to support business objectives. When decision-makers hired external cloud talent or outsourced services, the new workforce ramped quickly from a technical perspective, but experienced a steeper learning curve to understand priorities, processes, and the company ecosystem. Conversely, upskilled employees required time to learn the technical skills, but delivered value quicker given their enduring business acumen.

Modeling and assumptions. Forrester assumes the following for the composite organization:

- The composite fills 30 roles by upskilling internal employees in Year 1, 63 in Year 2, and 120 in Year 3.
- If these roles are filled with an external hire, the number of weeks to onboard the new hire into the company is 12 weeks.
- Given the institutional knowledge of upskilled employees, they ramp into the new cloud-related roles 20% more quickly than their external counterparts in Year 1, 25% in Year 2, and 30% in Year 3. The compounding effect results from the culture of learning, sharing of learnings, and the growing base of cloud-educated employees.
- The blended weekly cost of learners is $1,599.

Institutional knowledge leads to **20% to 30%** faster ramp for upskilled employees.

Risks. Forrester recognizes that these results may not be representative of all experiences, and the benefit will vary between organizations depending on:

- The actual rate at which an organization fills open roles with upskilled internal employees. This will vary by sector.
- Actual ramp time of new hires based on individual abilities.
- Actual burdened costs of both internal and external hires. This will vary by location, industry, level of experience, and job role.

Results. To account for these risks, Forrester adjusted this benefit downward by 10%, yielding a three-year, risk-adjusted total PV of $822,000.

Interviewee Voices: Learners Retain Institutional Knowledge

"Existing staff have institutional knowledge that newcomers don't. It's more powerful if you cross-train existing staff, because they're more productive and hands on."

— Head of enterprise and group projects, financial services

"The key benefit of upskilling the existing staff is their institutional knowledge and the culture. They understand the business. But trying to get somebody new, even though they might have the technical skills, to understand the overall [company] ecosystem, environment, procedures, and policies takes time. So, it makes more sense to invest in people who already know what they need to do rather than bringing fresh people who know just the technical pieces."

— Head of enterprise and group projects, financial services

Faster New Role Ramp Speed For Learners

Ref.	Metric	Source	Year 1	Year 2	Year 3
D1	Number of roles filled by upskilling internal employees	A7	30	63	120
D2	Number of weeks to ramp to cloud-related capacity without AWS T&C	Interviews	12	12	12
D3	Ramp time acceleration after participating in AWS T&C	Interviews	20%	25%	30%
D4	Number of weeks of ramp avoided for learners (rounded)	D2*D3	2	3	4
D5	Blended weekly cost of learners	$83,133/52 weeks	$1,599	$1,599	$1,599
Dt	Faster new role ramp speed for learners	D1*D4*D5	$95,940	$302,211	$767,520
	Risk adjustment	↓10%			
Dtr	Faster new role ramp speed for learners (risk-adjusted)		$86,346	$271,990	$690,768
	Three-year total: $1,049,104			**Three-year present value: $822,266**	

FASTER APP MIGRATION SAVINGS

Evidence and data. The interviewees described organizations that were excited to embrace the cloud and that had set ambitious goals for their cloud transformations. The program manager at a financial services organization said: "We have many applications that we want to migrate from on-premises to the cloud. Our goal is to have 75% of applications migrated to cloud by 2024." Without cloud-trained IT resources, these goals were at risk of being postponed. After the training sessions and applying their learnings, the program manager said, "We're on track to achieve those goals."

Customers found that, once their teams participated in AWS Training and Certification courses, they were able to apply their learnings to the cloud migration projects that aided their migration efforts. The expert in IT change management at a financial services organization described: "Our first migration wave was 12 weeks and very chaotic. It was stressful and we were scrambling. We didn't know what we didn't know. Whereas we finished the second wave over a weekend. When we did a retrospective, the comments were that we are working better, not necessarily working faster, but there were less surprises and the team knows what's about to happen next."

Over three years, the migration teams had more continuity and shared applied learnings with other employees who benefitted from their experience without needing to attend an AWS Training and Certification course.

Accelerated speed of app migration:

30% to 50%

Interviewee Voices: Learners Directly Impact Cloud Transformation

"The cloud migration project is the most important priority at this moment for IT and, after being trained, many employees began to actively participate in the project. This has guaranteed the project's continuity and success, and we've seen a positive impact on cloud-based versus on-premises applications."

— Skills analyst, financial services

"As an organization, we acknowledge that training employees is the number one step that's going to set us up for success."

— Expert in IT change management, financial services

"There are more people who understand AWS because of the training, so the migration speed to cloud is accelerated and staff can use AWS smoothly."

— General manager, group IT, professional services

"I can say that we're meeting our app migration goals and the technologists are becoming more cloud aware and cloud knowledgeable. That's in a large part due to the Training and Certification program that we're running with AWS."

— Program manager, financial services

"As we've gone on this journey with AWS, our infrastructure for support and ability to disseminate knowledge has increased. At the start, everything was new and slow. But then we started to establish standards of how we do things, security and automation features come in. We've seen an acceleration in the number of apps that are being migrated from those initial stages."

— Program manager, financial services

Modeling and assumptions. Forrester assumes the following for the composite organization:

- The composite has 60 business applications that it migrates to AWS before it reaches its goal of 100% cloud.
- In Year 1, the composite migrates 10% or six applications to AWS. In Year 2, the composite migrates an additional 12 applications and reaches a cumulative migration threshold of 30%. In Year 3, the composite migrates 18 applications and reaches a 60% migration threshold.
- The composite has a migration team of eight employees.
- Prior to using AWS Training and Certification programs, the migration effort of a single application takes 30 days.
- After the migration team participates in the AWS Training and Certification program, the team reduces the number of days to migrate an app by 30% in Year 1, 40% in Year 2, and 50% in Year 3.
- The average cost of a migration team member is $80,900 annually or $312 per day.
- Forrester attributes 50% of the benefit's value to the AWS Training and Certification investment. This attribution takes into consideration other factors contributing to improvements in migration speed like size, type, and source of application, as well as efficiencies gained from repetition of a task regardless of training.

Risks. Forrester recognizes that these results may not be representative of all experiences, and the benefit will vary between organizations depending on:

- The number of applications migrated onto AWS
- The size, prior experience, and relative costs of migration team.
- The number of days to migrate an application prior to the Training and Certification courses (or baseline).

Results. To account for these risks, Forrester adjusted this benefit downward by 10%, yielding a three-year, risk-adjusted total PV of $417,000.

Faster App Migration Savings

Ref.	Metric	Source	Year 1	Year 2	Year 3
E1	Total number of business applications for full multiyear cloud migration	Composite	60	60	60
E2	Percent of applications migrated to the cloud over three years (cumulative)	Interviews	10%	30%	60%
E3	Number of applications migrated per year	(E1*E2)-PY	6	12	18
E4	Days to migrate per application without AWS T&C	Six work weeks	30	30	30
E5	Accelerated speed of migration	Interviews	30%	40%	50%
E6	Number of days avoided per application migration	E4*E5	9	12	15
E7	Size of migration team	Composite	8	8	8
E8	Blended daily cost of migration team	$80,900/2,080 hours * 8 hours	$312	$312	$312
E9	Attribution to AWS T&C	Assumption	50%	50%	50%
Et	Faster app migration savings	E3*E6*E7*E8* E9	$67,392	$179,712	$336,960
	Risk adjustment	↓10%			
Etr	Faster app migration savings (risk-adjusted)		$60,653	$161,741	$303,264
	Three-year total: $525,658			**Three-year present value: $416,656**	

UNQUANTIFIED BENEFITS

Additional benefits that customers experienced but were not quantified for this study include:

- **Cost savings from faster cloud migration due to earlier independence from on-premises infrastructure.** This study was not intended to evaluate savings from moving from a traditional infrastructure to the cloud, but to quantify the marginal impact that AWS Training and Certifications drives for an organization on the cloud migration journey. The interviewed decision-makers noted that, because they had more highly trained staff after AWS Training and Certification investment, they migrated to the cloud more quickly and realized cloud-driven savings sooner than they would have without the training.
- **Improved cloud optimization from better trained decision-makers, IT leaders, architects, developers, and engineers.** Cloud usage can lead to lowered infrastructure costs. However, if not used optimally, cloud spend can overrun. Decision-makers noted that, with the skills learned through AWS Training and Certification, cloud architects, engineers and developers better understood and optimized the cloud environments, decreasing waste and driving savings for their organizations.
- **Reduced risk and improved security.** Decision-makers also indicated a sense of reduced risk due to the cloud training from AWS Training and Certification. The head of enterprise and group projects at a financial services organization said: "When they're trained, the risk of delivery reduces. But if somebody's not trained, the risk of delivery increases."

"I don't know how to say it in dollars, but we are sure that we're going to see those savings from moving to the cloud more quickly."

Skills analyst, financial services

"Once we have migrated our applications and are running on the cloud, we expect to see a reduction in costs and increase in productivity."

Expert in IT change management, financial services

"In terms of our cost in the cloud, there are automated systems that shut down unused instances that can cost quite a lot. And we've put controls in place that will shut those down if they're not being used. So, [education from AWS] is saving us lots of money in terms of our cost in the cloud."

Director of business and technology solutions, real estate

- **Higher availability and resiliency.** The program manager at a financial services organization noted: “I certainly know that there’s been cases where downtime has decreased. Resiliency and observability are big topics at the moment in terms of always ensuring that if something fails, there’s other points that can pick up that slack. So, I know that that has improved hugely.”
- **More applications and better fit candidates.** Many of the decision-makers tout their AWS Training and Certification opportunities as a perk of working at their companies. In doing so, they have received more interested applicants who are better fit for the posted roles. The expert in IT change management at a financial services organization described: “We have additional hiring strategies. You could say we want the best talent in the market working for our organization. With the help of AWS, we have hosted events to attract these candidates.”

“The implications of a security breach would have huge financial implications. So, safety in the cloud is key. Although it’s not a cost you can capture, that’s one of the biggest benefits for us.”

Program manager, financial services

“[AWS Training and Certification] has a lot of impact on employability. Today, to recruit, it's very simple because the employees who join us know that they will learn and we will support their growth. This is what employees are looking for today. We are a ‘great place to work’ and employees feel good with us.”

Director of business and technology solutions, real estate

FLEXIBILITY

The value of flexibility is unique to each customer. There are multiple scenarios in which a customer might implement AWS Training and Certification and later realize additional uses and future business opportunities, including:

- **Exploring alternative paths to hiring talent.** Two decision-makers identified that their organizations could be more flexible with hiring after investing in AWS Training and Certification. Instead of focusing on hiring senior cloud professionals, they chose to lean on internships and entry-level employees with longer ramp times but lower costs. They also looked to hire individuals with tangentially related skills and more junior developers with an appetite for change and interest in learning.
- **Transferable cloud skills to support hybrid cloud strategy.** Much of the education AWS Training and Certification provides has application across other public and private clouds. Learners with AWS can apply much of the theory to support other areas of cloud development and a hybrid cloud strategy. The skills analyst for a financial services organization said, "We have improved technical skills in AWS, but it also opens the mind to acquire knowledge in other cloud tools easier."

Flexibility could also be quantified when evaluated as part of a specific project (described in more detail in Appendix A).

"When I think about all the things that we're doing externally to put ourselves in the public eye and attract talent, having AWS there has 100% played a part. It's given us more credibility."

Expert in IT change management, financial services

"We quickly zeroed in on not only upskilling our own employees, but also bringing in more entry-level talent. We started hiring more university graduates, we started providing more internships, and we even formed our own apprenticeship program for the cloud, which kicked off formally this year."

VP of infrastructure and operations, public sector

Analysis Of Costs

Quantified cost data as applied to the composite

Total Costs							
Ref.	**Cost**	**Initial**	**Year 1**	**Year 2**	**Year 3**	**Total**	**Present Value**
Ftr	AWS Training and Certification fees	$0	$275,275	$458,650	$733,500	$1,467,425	$1,180,389
Gtr	Cost of learner time dedicated to AWS Training and Certification	$0	$299,376	$496,249	$787,490	$1,583,115	$1,273,936
Htr	AWS Training and Certification program setup and ongoing management	$12,672	$2,112	$14,784	$14,784	$44,352	$37,918
	Total costs (risk-adjusted)	$12,672	$576,763	$969,683	$1,535,774	$3,094,892	$2,492,243

AWS TRAINING AND CERTIFICATION FEES

Evidence and data. Customers incurred costs for the AWS training courses and certifications. Learners also took advantage of the more than 500 free digital courses AWS offers.

Interviewees' organizations had unique training plans, tailored to fit their needs and paid fees to AWS based on their training course mix.

Interviewees' organizations purchased vouchers for certifications as well as received complimentary vouchers from AWS. Depending on the level of the certification, costs per certification were in the low hundreds of dollars.

Modeling and assumptions. Forrester assumes the following for the composite organization:

- The composite has 150 unique learners in Year 1, 250 in Year 2, and 400 in Year 3.
- Each learner participates in one three-day course.
- The cost of a three-day course is $1,800 per person. To create a conservative cost estimate, the costs applied to the composite are list price for North America and have not been adjusted to reflect a global footprint, discounting, or itemized by type of course offering.
- Of the learners who participate in a three-day course, 23 will go forward to become associate- or foundational-level certified in Year 1, 38 in Year 2, and 60 in Year 3.
- The average cost of associate- and foundational-level certifications is $125.
- Of the learners who participate in a three-day course, 8 will go forward to become professional- or specialty-level certified in Year 1, 13 in Year 2, and 20 in Year 3.
- The average cost of professional- and specialty-level certifications is $300.

Risks. Forrester recognizes that these results may not be representative of all experiences, and the cost will vary between organizations depending on:

- Prices for AWS Training and Certification, which vary depending on delivery mechanism of class, number of learners, location of learners, contract negotiations, and overall scope of AWS and customer relationship.

The best way to estimate fees for AWS Training and Certification is to speak directly with an AWS representative.

Results. To account for these risks, Forrester adjusted this cost upward by 0%, yielding a three-year, risk-adjusted total PV (discounted at 10%) of $1.18 million.

AWS Training and Certification Fees

Ref.	Metric	Source	Initial	Year 1	Year 2	Year 3
F1	Number of AWS users participating in training	Composite		150	250	400
F2	Average number of courses per learner	Composite		1	1	1
F3	Average cost per three-day course per learner	Interviews		$1,800	$1,800	$1,800
F4	Subtotal: Training costs	F1*F2*F3		$270,000	$450,000	$720,000
F5	Number of associate- and foundational-level certifications awarded	15% of F1		23	38	60
F6	Average associate- and foundational-level certification cost	Interviews		$125	$125	$125
F7	Number of professional- and specialty-level certifications awarded	5% of F1		8	13	20
F8	Professional- and specialty-level certification cost	Interviews		$300	$300	$300
F9	Subtotal: Certification costs	F5*F6+F7*F8		$5,275	$8,650	$13,500
Ft	AWS Training and Certification fees	F4+F9	$0	$275,275	$458,650	$733,500
	Risk adjustment	0%				
Ftr	AWS Training and Certification fees (risk-adjusted)		$0	$275,275	$458,650	$733,500
	Three-year total: $1,467,425			**Three-year present value: $1,180,389**		

COST OF LEARNER TIME DEDICATED TO AWS TRAINING AND CERTIFICATION

Evidence and data. The most significant cost to the interviewees' organizations was time spent learning, studying, and sitting for exams.

- **Time spent participating in training classes.** Depending on content and the delivery mechanism, decision-makers cited that learners participated in courses that ranged between 30 minutes to three days.
- **Time spent finishing labs.** Beyond the three-day course, learners also frequently had to finish labs outside of the training, ranging from three to eight hours of additional study time. Some organizations offered "office hours" for learners to apply and discuss the learning material.
- **Time spent studying for and taking exams.** To prepare for a certification exam, learners dedicated an average of 85 hours of study time each for the associate- and professional-level exams. The examination lengths varied depending on certification level. For example, the AWS Certified Developer exam is 130 minutes.

Modeling and assumptions. Forrester assumes the following for the composite organization:

- The number of unique learners participating in training is 150 in Year 1, 250 in Year 2, and 400 in Year 3.
- The composite's learners participate in three-day courses, and learners spend one hour each day outside of the course finishing assignments and reviewing materials.
- The composite assumes a learner participates in one three-day course.
- Of the learners who participate in a three-day course, 23 will go forward to become associate- or foundational-level certified in Year 1, 38 in Year 2, and 60 in Year 3.
- The blended global hourly cost of a learner is $40.
- Each learner will dedicate an additional 85 hours to certification preparation and examination.
- Of the learners who participate in a three-day course, 8 will go forward to become professional- or specialty-level certified in Year 1, 13 in Year 2, and 20 in Year 3.
- Each experienced learner will dedicate an additional 85 hours to professional or specialty certification preparation and examination.
- The experienced learners (those who pursue professional- or specialty-level certifications) are more technical than their general learner peers and have a blended global hourly cost of $47.

Risks. Forrester recognizes that these results may not be representative of all experiences, and the benefit will vary between organizations depending on:

- Number of learners participating in courses.
- The content level of courses, delivery mechanism, and frequency of course offerings.
- Study time, which will depend on the learner and experience level.
- Additional time for coaching, lunch and learns, drinks, and social hours after the trainings.
- Opportunity costs, which may include additional factors like lost production or lost revenues.
- Incurred expenses related to classroom rentals, learner and teacher travel time, papers and materials, food and lodging, and rewards and recognition.

Results. To account for these risks, Forrester adjusted this cost upward by 10%, yielding a three-year, risk-adjusted total PV of $1.27 million.

Cost Of Learner Time Dedicated To AWS Training and Certification

Ref.	Metric	Source	Initial	Year 1	Year 2	Year 3
G1	Number of learners	Composite		150	250	400
G2	Hours spent on learning per course	Interviews		27	27	27
G3	Average number of courses per learner	Composite		1	1	1
G4	Blended hourly burdened cost of learners	$83,133/2,080 hours		$40	$40	$40
G5	Subtotal: Time dedicated to learning	G1*G2*G3*G4	$0	$162,000	$270,000	$432,000
G6	Number of associate-level certifications awarded	F5		23	38	60
G7	Hours spent on associate-level certification preparedness and examinations	Interviews		85	85	85
G8	Blended hourly burdened cost of learners	$83,133/2,080 hours		$40	$40	$40
G9	Number of professional-level certifications awarded	F7		8	13	20
G10	Additional hours spent on professional-level certification preparedness and examinations	Interviews		85	85	85
G11	Blended hourly cost of experienced learners	$98,000/2,080 hours		$47	$47	$47
G12	Subtotal: Time dedicated to certifications	(G6*G7*G8) + (G9*G10*G11)	$0	$110,160	$181,135	$283,900
Gt	Cost of learner time dedicated to AWS Training and Certification	G5+G12	$0	$272,160	$451,135	$715,900
	Risk adjustment	↑10%				
Gtr	Cost of learner time dedicated to AWS Training and Certification (risk-adjusted)		$0	$299,376	$496,249	$787,490
	Three-year total: $1,583,115			**Three-year present value: $1,273,936**		

AWS TRAINING AND CERTIFICATION PROGRAM SETUP AND ONGOING MANAGEMENT

Evidence and data. The interviewees' organizations incurred the following internal costs related to the setup and ongoing management of their AWS Training and Certification programs:

Learning Needs Analysis participation and administration. The Learning Needs Analysis (LNA) is a free self-assessment survey that helped interviewees identify their organizations' cloud skills gaps and set a benchmark for existing skills capacity. The AWS team analyzed the survey results to create a data-driven training strategy unique to each organization's needs and goals.

- Interviewees' organizations surveyed a representative population of their workforce prior to their AWS Learning and Certification journeys. Each were surveyed again annually to measure progress. On average, 50% of the cloud-related employees participated in the survey and dedicated 25 minutes each to completing the survey.
- Interviewees noted that a learning and development manager or administrator was responsible for fielding the LNA and working with AWS on interpreting and communicating results.
- Interviewees cited between 1.5 and three months of elapsed time spent on preparation for the Training and Certification plan development.

Ongoing progress tracking and program management. The interviewees noted there were additional duties to support the AWS Learning and Certification program. Often performed by an existing resource from HR, these tasks included:

- Tracking learning participants, and the number and type of courses attended.
- Collecting successful certification information from learners. Some of the interviewees' organizations had learners pay out of pocket for their AWS certifications and then refunded them after the certification was successfully attained.
- Reaching out to learners and asking them to complete their profiles with self-reported certifications and skills.
- Building a framework for measuring the effectiveness of the training.
- Fielding and interpreting surveys focused on general satisfaction of learner experience and using feedback to improve the courses.

> **"We take regular survey feedback after all of our courses, and the general feedback has been quite positive for the virtual training."**
>
> *Program manager, financial services*

Modeling and assumptions. Forrester assumes the following for the composite organization:

- The composite has 1,000 cloud-related employees and 50% of those employees participate in the Learning Needs Analysis survey. The survey takes each employee approximately 25 minutes to complete. The survey is conducted before the learning journey begins and again in Years 2 and 3.
- A learning and development manager facilitates the LNA, dedicating approximately 80 hours to the efforts each time the survey is conducted.
- The learning and development manager also spends approximately 4 hours per month on manually tracking learning and certification activities for the organization.
- The blended global hourly cost of learners and the learning and development manager is $40.

Risks. Forrester recognizes that these results may not be representative of all experiences, and the benefit will vary between organizations depending on:

- Size of employee population that participates in the LNA and actual time required for individuals to complete the survey.
- Actual time dedicated by a learning and development manager to program management. An effective training plan will require ongoing administration efforts outside of the learning and certification efforts themselves, but the extent will vary.
- Burdened costs of individual employees, which is highly dependent on location, role, and experience.

Results. To account for these risks, Forrester adjusted this cost upward by 10%, yielding a three-year, risk-adjusted total PV of $38,000.

Forrester's Perspective: How To Establish A Best-In-Class Cloud Training Program

In the report "Mind The Cloud Skills Gap," Forrester analyst Tracy Woo provides advice on approaches to building the talent and teams enterprises need for success. She suggests seven tenets that every training program should embrace:

- Start small.
- Train infrastructure admins to code.
- Perform low-stakes testing.
- Use innovation labs to change speed and process expectations.
- Choose depth over breadth.
- Enhance with analytics and optimization.
- Pick the right leader.

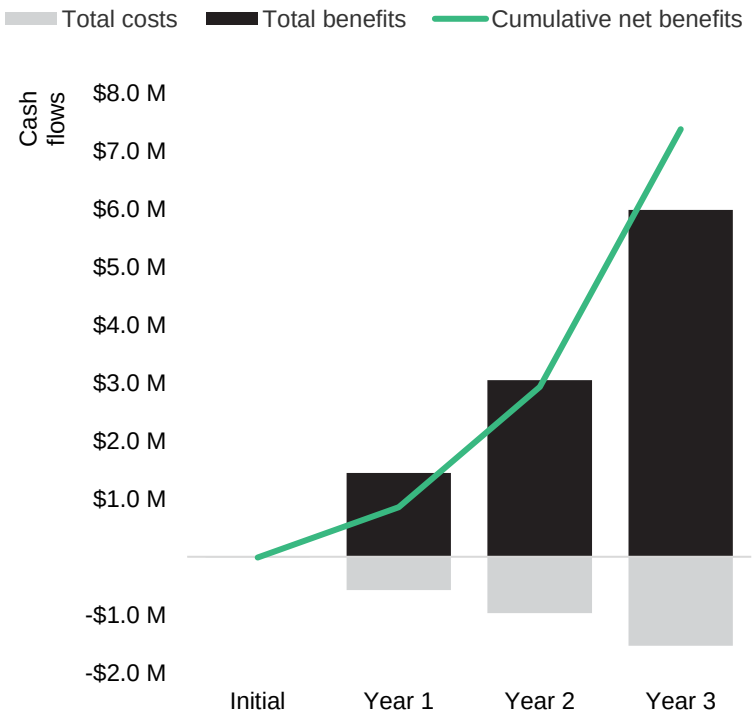
AWS Training And Certification Program Setup And Ongoing Management

Ref.	Metric	Source	Initial	Year 1	Year 2	Year 3
H1	Hours dedicated to Learning Needs Analysis survey	Interviews	208	0	208	208
H2	Blended hourly burdened cost of learners	$83,133/2,080 hours	$40	$40	$40	$40
H3	Hours dedicated to Learning Needs Analysis planning and management	Interviews	80		80	80
H4	Hours dedicated to ongoing AWS T&C tracking	Interviews		48	48	48
H5	Blended hourly cost of learning and development manager	$83,133/2,080 hours	$40	$40	$40	$40
Ht	AWS Training and Certification program setup and ongoing management	H1*H2+ (H3+H4) *H5	$11,520	$1,920	$13,440	$13,440
	Risk adjustment	↑10%				
Htr	AWS Training and Certification program setup and ongoing management (risk-adjusted)		$12,672	$2,112	$14,784	$14,784
	Three-year total: $44,352			**Three-year present value: $37,918**		

Financial Summary

CONSOLIDATED THREE-YEAR RISK-ADJUSTED METRICS

Cash Flow Chart (Risk-Adjusted)



The financial results calculated in the Benefits and Costs sections can be used to determine the ROI, NPV, and payback period for the composite organization's investment. Forrester assumes a yearly discount rate of 10% for this analysis.

These risk-adjusted ROI, NPV, and payback period values are determined by applying risk-adjustment factors to the unadjusted results in each Benefit and Cost section.

Cash Flow Analysis (Risk-Adjusted Estimates)

	Initial	Year 1	Year 2	Year 3	Total	Present Value
Total costs	($12,672)	($576,763)	($969,683)	($1,535,774)	($3,094,892)	($2,492,243)
Total benefits	$0	$1,443,097	$3,044,749	$5,979,908	$10,467,753	$8,321,021
Net benefits	($12,672)	$866,334	$2,075,066	$4,444,134	$7,372,862	$5,828,778
ROI						234%
Payback period (months)						<6

Appendix A: Total Economic Impact

Total Economic Impact is a methodology developed by Forrester Research that enhances a company's technology decision-making processes and assists vendors in communicating the value proposition of their products and services to clients. The TEI methodology helps companies demonstrate, justify, and realize the tangible value of IT initiatives to both senior management and other key business stakeholders.

TOTAL ECONOMIC IMPACT APPROACH

Benefits represent the value delivered to the business by the product. The TEI methodology places equal weight on the measure of benefits and the measure of costs, allowing for a full examination of the effect of the technology on the entire organization.

Costs consider all expenses necessary to deliver the proposed value, or benefits, of the product. The cost category within TEI captures incremental costs over the existing environment for ongoing costs associated with the solution.

Flexibility represents the strategic value that can be obtained for some future additional investment building on top of the initial investment already made. Having the ability to capture that benefit has a PV that can be estimated.

Risks measure the uncertainty of benefit and cost estimates given: 1) the likelihood that estimates will meet original projections and 2) the likelihood that estimates will be tracked over time. TEI risk factors are based on "triangular distribution."

The initial investment column contains costs incurred at "time 0" or at the beginning of Year 1 that are not discounted. All other cash flows are discounted using the discount rate at the end of the year. PV calculations are calculated for each total cost and benefit estimate. NPV calculations in the summary tables are the sum of the initial investment and the discounted cash flows in each year. Sums and present value calculations of the Total Benefits, Total Costs, and Cash Flow tables may not exactly add up, as some rounding may occur.

PRESENT VALUE (PV)

The present or current value of (discounted) cost and benefit estimates given at an interest rate (the discount rate). The PV of costs and benefits feed into the total NPV of cash flows.

NET PRESENT VALUE (NPV)

The present or current value of (discounted) future net cash flows given an interest rate (the discount rate). A positive project NPV normally indicates that the investment should be made, unless other projects have higher NPVs.

RETURN ON INVESTMENT (ROI)

A project's expected return in percentage terms. ROI is calculated by dividing net benefits (benefits less costs) by costs.

DISCOUNT RATE

The interest rate used in cash flow analysis to take into account the time value of money. Organizations typically use discount rates between 8% and 16%.

PAYBACK PERIOD

The breakeven point for an investment. This is the point in time at which net benefits (benefits minus costs) equal initial investment or cost.

Appendix B: Endnotes

[1] Source: Jennifer Rouse, “Build Instead Of Buy: Investing In Training Helps Teams At Emerging Companies To Grow,” Forrester Blogs (https://www.forrester.com/blogs/training-helps-emerging-companies-grow/).

[2] Total Economic Impact is a methodology developed by Forrester Research that enhances a company’s technology decision-making processes and assists vendors in communicating the value proposition of their products and services to clients. The TEI methodology helps companies demonstrate, justify, and realize the tangible value of IT initiatives to both senior management and other key business stakeholders.

[3] Customers were selected by AWS with the following criteria: Between six months and three years of AWS Training and Certification; a strong before and after story; the ability to speak to before and after environments with measurements; a representative use case; a representative size of target audience.

[4] Source: “Mind The Cloud Skills Gap,” Forrester Research, Inc., March 11, 2020; Based on March 2022 data pulled from Indeed.com and LinkedIn.com.

[5] Source: “Mind The Cloud Skills Gap,” Forrester Research, Inc., March 11, 2020.

[6] Organizations looking to participate in the AWS Skills Guild must meet certain requirements in order to qualify for the program, including parameters around executive sponsorship, minimum training requirements, and ongoing level of time commitment to the program. Speak with a representative from AWS to determine eligibility.

[7] Source: “Mind The Cloud Skills Gap,” Forrester Research, Inc., March 11, 2020.

[8] Risk is the third component within the TEI model; it is used as a filter to capture the uncertainty surrounding different cost and benefit estimates. The risk-adjusted values should be taken as "realistic" expectations. In general, risks affect costs by raising them, while eroding potential benefits. TEI consultants use risk adjustment to account for uncertainty, variability, and to generate more conservative cost and benefit estimates and subsequent ROI results. Risk ranges from low to high or approximately 5% to 20%, and very high-risk adjustments are at the discretion of the consultant.

[9] Source: “Mind The Cloud Skills Gap,” Forrester Research, Inc., March 11, 2020.


FORRESTER®