

# 7 CRITICAL SUCCESS FACTORS FOR CLOUD ADOPTION

*An Astadia CloudGPS Whitepaper*

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## EXECUTIVE SUMMARY

Cloud computing surrounds us every day - whether we are overseeing the shipment of millions of packages per day around the world or we are just ordering lunch using the mobile app from the salad joint downstairs.

If you are an executive of any organization or you have a role in the information technology group, you are somewhere on the spectrum of deciding if, how and when to adopt cloud computing. You are or soon will be investing in the promises it offers - reimagined customer experiences, dramatically improved cost models and technological scale that was only achievable by the largest of enterprises.

The journey, however, is not always smooth and there are plenty of challenges that await those who would lead their organizations down this path.

With this whitepaper, we at Astadia highlight 7 Critical Success Factors for Cloud Adoption that you must address. Which of these impacts you the most will be different from those that most impact others.

We have focused our discussion on the following:

- Embark on a Journey, Not a Monolithic Project
- Understand the Cloud Essentials
- Understand the Business Drivers
- Apply the Right People, Processes and Partners
- Develop Appropriate Metrics to Gauge Success
- Choose the Right Cloud Service Provider
- Determine When to Tackle Business Transformation

What are other key factors that you'd recommend to others? We welcome your feedback and encourage your questions. You can reach us at [SuccessFactors@Astadia.com](mailto:SuccessFactors@Astadia.com) and we'll post updates on our blog at [CloudGPS.Astadia.com](http://CloudGPS.Astadia.com).



## INTRODUCTION

Chances are that if you are reading this whitepaper, you have or will soon begin a close relationship with cloud computing. In fact, Gartner indicated in a July 20, 2016 press release that more than “\$1 trillion in IT spending will be directly or indirectly affected by the shift to cloud during the next five years.”

The undeniable impact that “The Cloud” is having throughout the world is the result of three rivers of change merging together – the capabilities of cloud computing, the proliferation of smart computing devices into the hands of end-users and an insatiable appetite and receptive environment for disruptive business transformation.

This may seem like it happened overnight, but the idea of providing IT needs from the modern Internet can be said to have begun in the mid- to late 90s as the application service provider (ASP) paradigm took hold - using the Internet to provide web-based applications without the need to install software on local machines.

Enter Amazon.com in the late 90s, as an online retailer selling books (yes, just books in the beginning). As their success grew into the new millennium, so did their technology demands; and as their needs outstripped their IT capabilities, they were driven to rethink their approach. Benjamin Black, one of the co-authors of the proposal that resulted in Amazon Web Services (AWS), commented to Network World that they sought to abstract and decouple infrastructure from applications. As noted in the article, the fundamental key to AWS today remains the undifferentiated access to incredible infrastructure capabilities to anyone.<sup>1</sup>

Today, an entire cloud ecosystem has emerged with compute, storage, and networking capabilities fueling platform services such as big data and analytics, bringing to life entirely new business models. It is continually evolving to meet the demands and imagination of today’s businesses and customers, governments and constituents, employers and employees. Leading the way are the major public cloud vendors – AWS, Microsoft Azure, Google Cloud Platform, IBM Soft Layer and Oracle Cloud – supported by an ecosystem of thousands of independent software vendors and consulting providers.

The promises of cloud computing – increased performance, lower costs, elasticity (instant scalability up and down), reliability and, yes, impressive security, have resulted in a gold rush of sorts, with massive effort and spending being invested in adopting the cloud throughout organizations.

In many cases, well-intentioned cloud initiatives or “cloud mandates” are issued, directing a full and complete change-over. Clearly there have been successes, but less talked about have been the failures – one recent report indicated that 40% of enterprise workloads moved to the cloud have been pulled back to either on-premise or co-located datacenters.<sup>2</sup>

This does not come as a surprise to the platform change experts of Astadia. For over 25 years, Astadia has been engaged in the practice and discipline of platform change and total lifecycle services. Pre-cloud, the major platform change projects related to moving applications and databases from mainframes to distributed server architectures in the datacenter. In recent years, there has been a growing push to take the remaining mainframe workloads out there (there’s still a significant amount) directly to the cloud.

Astadia’s experience in migrating and modernizing these mission-critical, business-logic-of-record applications has resulted in our rock-solid methodology, best practices and lessons learned that ensure a successful cloud adoption project. We interviewed our gurus, spoke with additional third-party experts and conducted additional research to bring you this paper.

In the pages that follow, you’ll read about 7 Critical Success Factors for Cloud Adoption, including:

- Embark on a Journey, Not a Monolithic Project
- Understand the Cloud Essentials
- Understand the Business Drivers
- Apply the Right People, Processes and Partners
- Develop Appropriate Metrics to Gauge Success
- Choose the Right Cloud Service Provider
- Determine When to Tackle Business Transformation

## 7 CRITICAL SUCCESS FACTORS FOR CLOUD ADOPTION

You should explore these critical success factors to determine how they may apply to your own cloud adoption projects. There are undoubtedly more factors not listed here. We look forward to your feedback and welcome the opportunity to partner with you to ensure your cloud journey is a success, too. Please email us any comments or questions at [SuccessFactors@Astadia.com](mailto:SuccessFactors@Astadia.com) and check out our blog at [CloudGPS.Astadia.com](http://CloudGPS.Astadia.com) for ongoing discussion and updates.

### SUCCESS FACTOR: EMBARK ON A JOURNEY, NOT A MONOLITHIC PROJECT

Adoption of the cloud is still a relatively recent IT initiative. According to research done by the Computing Technology Industry Association (CompTIA), only 6% of companies claim to have been using cloud solutions for more than five years.<sup>3</sup>

Many organizations have adopted cloud-based Software-as-a-Service (SaaS) solutions. Others have adopted a “cloud-first” development paradigm for net-new projects, while still others have focused on migrating part or much of their IT infrastructure to the cloud. Perhaps you are just beginning your journey and learning what the cloud can mean for your business.

Cloud computing is a fast-maturing technology and it is here to stay (caveat: well, at least for 20 - 30 years until the next technological revolution – quantum computing?).

*“By 2020, a corporate ‘no-cloud’ policy will be as rare as a ‘no-Internet’ policy is today.”*

- Gartner; Applying a ‘Cloud-First’ checklist to ensure successful sourcing and business-IT alignment, April 2016

One of the keys to a successful cloud-computing journey is to take small steps rather than assume that your organization must move into the cloud in one fell swoop. Have you heard the adage – “How do you eat an elephant? One bite at a time.” That is especially true here - some applications are more well-suited for the cloud than others. Some are easy to migrate while others are more difficult. Resist the urge to make cloud adoption a monolithic project with a single pass/fail completion or delivery date.

So, where do you begin? It is our recommendation to begin with a thorough assessment of your application portfolio. Good news – there are many automated tools out there to help you monitor, measure and then model possible cloud configurations. The tools we use at Astadia map out dependencies, forecast costs across multiple clouds and provide output needed for a prioritized, phased roadmap for migrating existing workloads to the cloud (for those apps that are assessed to make the move at all – not all workloads could or should be migrated to the cloud).

We also recommend taking a value-based approach to your application rationalization - mapping your identified applications to a quadrant based on value and complexity and knock-out some smaller wins first.

These first steps should also include discussions around governance and security, to include identity and access management, for the entire blended IT eco-system.

It is also prudent to bake in a well-defined continuous feedback loop and deliberate pauses between milestones to refine your strategy as you gain experience and confidence.

Without these precautions, you may embark on your cloud adoption journey only to learn that a migrated application was better left on-premise. If so, you will not be alone:

*“... nearly 40% of organizations with public cloud experience report having moved public cloud workloads back to on-premise, mostly due to security and cost concerns. This underscores the importance of understanding workload requirements prior to making platform decisions to avoid risk and control costs.”*

- IDG; Data Centers in Flux: The IT Optimization Challenge, Q3 – 2016

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One additional note – to be ultimately successful, cloud adoption must have full buy-in and executive sponsorship from the leadership team, including the CEO. We strongly encourage a holistic assessment of the people, culture, business environment, etc., to prepare the organization for all the change and impact that a move to the cloud will bring.

Businesses and organizations are increasingly seeing the benefits of moving applications, database and infrastructure into the cloud. With careful planning and achievable milestones, you will avoid missteps along the way. Your organization will learn from the experience and gain the many benefits that come from cloud adoption.

### SUCCESS FACTOR: UNDERSTAND THE CLOUD ESSENTIALS

New technology that experiences high growth rates will inevitably attract hyperbole. Cloud computing is no exception and almost everyone has their own definition of cloud from “it’s on the Internet” to a full-blown technical explanation of the myriad compute options available from a given cloud service provider.

Fortunately, the National Institute of Standards and Technology (NIST) has provided us with a definition of cloud computing that identifies “five essential characteristics”<sup>4</sup>; these are:

**On-demand self-service.** A consumer [of cloud services] can unilaterally provision computing capabilities, such as server time and network storage, as needed, automatically without requiring human interaction with each service provider.

Read: Get what you want, when you want it, with little fuss.

**Broad network access.** Capabilities are available over the network and accessed through standard mechanisms that promote use by heterogeneous thin or thick client platforms (e.g., mobile phones, tablets, laptops, and workstations).

Read: Anyone, anywhere can access anything you build for them.

**Resource pooling.** The provider’s computing resources are pooled to serve multiple consumers using a multi-tenant model, with different physical and virtual resources dynamically assigned and reassigned according to consumer demand.

Read: It’s the Doritos’ Principle – “go ahead, crunch all you want; we’ll make more.” Economies-of-scale on galactic proportions.

**Rapid elasticity.** Capabilities can be elastically provisioned and released, in some cases automatically, to scale rapidly outward and inward commensurate with demand. To the consumer, the capabilities available for provisioning often appear unlimited and can be appropriated in any quantity at any time.

Read: Get what you want, when you want it... **then give it back.**

**Measured service.** Cloud systems automatically control and optimize resource use by leveraging a metering capability at some level of abstraction appropriate to the type of service (e.g., storage, processing, bandwidth, and active user accounts). Resource usage can be monitored, controlled, and reported, providing transparency for both the provider and consumer of the utilized service.

Read: Get what you want, when you want it, then give it back... **and only pay for what you use.**

So, what does this mean? How should you think about cloud computing? In the introduction, we referenced how Benjamin Black, one of the Amazon.com co-authors of the proposal that created AWS, proposed the idea of abstracting infrastructure and undifferentiating it for all “consumers” (to borrow the term from the NIST definition).

### RECOMMENDED STEPS FOR SUCCESS:



- Assess your infrastructure and applications for cloud readiness
- Assess your business processes for cloud readiness
- Determine which items to move, which to keep, and which to retire.

## 7 CRITICAL SUCCESS FACTORS FOR CLOUD ADOPTION

Now that public cloud service providers exist, you – the consumer of cloud services – can log onto one of the cloud service providers' dashboards and order up X units of compute capacity, Y units of storage capacity and toss in other services and capabilities as needed. Your IT team is not provisioning any of the hardware, building images, etc. and this all happens within minutes vs. the weeks it would normally take in a conventional on-premise scenario.

But, is this cloud computing? Maybe not quite yet. Next, you want to populate this cloud ecosystem you've started with applications and data. You'll start with a proper assessment and likely migrate a handful of workloads to your new environment (commonly referred to as "lift and shift"). They now reside in the cloud, but whether or not it's cloud computing could still be challenged. We don't mean to dissuade you from taking this step, as there could be (not assuredly, but very likely could be) significant cost savings and performance improvements gained from moving existing workloads.

Compare this to the case of applications and services built natively in the cloud or existing workloads that have been re-engineered and re-built to take advantage of the essential cloud computing capabilities discussed above. These "born in the cloud" or "re-born" applications would be characterized by being able to automatically scale up and down rapidly in response to demand, work across multiple regions of the world without additional configuration, and provide and consume other services and micro-services via various integration options. When your applications are fully architected for the cloud, you are truly maximizing the potential of cloud computing.

### SUCCESS FACTOR: UNDERSTAND THE BUSINESS DRIVERS

Cloud computing is a fundamentally new way of providing technology infrastructure and other related components and services needed to propel your business forward. Yet, if this was merely the latest improvements to "speeds and feeds", then it would not be the driving force it has been in transforming businesses and industries around the world. Here are the top business drivers you need to keep in mind – where they rank in importance will vary from one organization to another.

#### Optimizing the Cost Model

A dedicated, owned or leased infrastructure requires an organization to provide the capital investment necessary to design and build the necessary IT ecosystem to meet expected peak demand, even if those peak loads only occur on a seasonal basis. When not running at peak, that excess capacity equals lost value that you can't bank for future use.

In the cloud, you provide for your needs "a la carte"; you pay only for what you need, when you need it and can readily purchase more (or less) based upon current demand. This fractional consumption model opens the door to a far more cost-effective IT infrastructure and is one of the top drivers behind cloud adoption.

You typically pay for your cloud consumption on a fractional basis, as well. Instead of large massive, multi-year deals, you can pay monthly. The cloud service providers do offer some additional cost breaks if you pay in annual increments, but that does not preclude you from adding additional services, as needed. The way this would manifest is to negotiate an annual contract for your base demand and then use incremental payments for additional services needed. It flips the traditional model on its head.

#### Shifting Costs to Invest in Innovation

Even if all cloud did was reduce the costs of maintaining current systems and shift budgets from capital expenditures (CAPEX) to operational expenditures (OPEX), it would be a worthwhile exercise for most IT organizations, but migration to the cloud offers many additional benefits.

#### RECOMMENDED STEPS FOR SUCCESS:



- Make sure you understand the market, strengths, and drivers for each cloud provider
- Evaluate apps for potential replacement with a SaaS-based platform
- Understand application use cases and whether scalability is a requirement



*"IT groups are forced to spend about 80% of their budgets on old, inefficient IT infrastructure and applications, including support, upgrades and patches. This leaves about 20% for innovative new development."*

- Mark Hurd, CEO Oracle, OpenWorld Conference, September 2016

Historically, most IT spending goes towards the maintenance of existing systems. Innovation is forced to get by on whatever money is left in the budget. Yet, innovation is becoming more critical to the long-term survival of an enterprise. Reducing maintenance costs frees up capital and staff to truly partner with the business and focus on innovation, reimagined customer experiences and transformed business processes.

### Fueling Rapid Innovation and Continuous Improvement

One of the most phenomenal impacts of cloud computing is this idea that any student in a dorm, any techie in a garage, or any innovator in the enterprise can reach out and tap into the same unimaginable wealth of technological capability. Access to hardware, networks, distribution, services, etc., is no longer a barrier to entry holding back wildly inventive minds.

In addition to immediate and rapid provisioning of resources, today's cloud development environments, when paired with agile development methodologies, allows for extremely quick building, testing, deployment and improvement of applications and services deployed. It has given rise to the credo of "fail small, fail fast, fail often," an approach that encourages rapid prototyping and testing of small bets to uncover the hidden gems, then making big bets on what works.

### The Revolution of DevOps

Coming along with this technological revolution is the rethinking of how development teams and operations teams work together. Previously, these two disciplines may have operated in their separate silos, with development writing code and "throwing it over the wall" and ops stuck pushing to production and fixing any conflicts.

Modern DevOps targets rapid releases of software and services at a faster pace, without sacrificing high quality, by focusing on an integrated and collaborative approach.

It is our belief that the companies who embrace cloud and DevOps will out innovate their slower-moving competition.

### Competitive Factors

The business imperative for cloud adoption may also be influenced by the competitive environment in your industry. In many industries, the companies that make the best (and earliest) use of cloud computing will gain a competitive advantage, while the competitors who fail to understand the cloud and delay their adoption may find themselves at a long-term disadvantage.

This isn't a phenomenon unique to cloud computing – look back at Blockbuster vs. Netflix (in its rebirthed version of online content streaming); Uber vs the Taxi Industry; Air BNB vs Travel Agencies. Those businesses that adapt to change, those that embrace change – those are the businesses that thrive.

As you assess your industry, some factors to consider include:

- The importance of cost leadership in your industry
- The pace of application development among your competition
- Your customers' changing expectations
- Regulations that apply to your industry

These industry-specific factors can help you determine the appropriate pace of your cloud adoption and whether there are additional compelling business drivers that place your company at risk if you don't act. Don't forget to consider competitive threats coming from external players outside your industry/market.

### Evolution of Security

Many business executives have asked the question, "Is it safe to put my company information assets in the cloud?" It's time to challenge the assumption applications and data in the cloud are at greater risk than keeping those in-house. In fact, many experts think the cloud now offers superior security:

*"Through 2020, public cloud infrastructure as a service (IaaS) workloads will suffer at least 60% fewer security incidents than those in traditional data centers."*

- Jay Heiser, research vice-president, Gartner, January 23, 2017

Of course, no business undertaking is risk-free. You must assess your company's risk tolerance and ensure you and your teams understand the true and current security capabilities of the various cloud solutions you are evaluating. Once you have all the information, you can create the proper security and governance capabilities that span your blended enterprise and cloud IT ecosystem.

## SUCCESS FACTOR: APPLY THE RIGHT PEOPLE, PROCESSES, AND PARTNERS TO CLOUD ADOPTION

In a perfect world, once you've decided that there are benefits to using cloud services, you could suspend your enterprise and business activities for several weeks or months and focus your whole IT team on just that. But in the real world, your sales force can't stop selling, your production lines still need systems associated with shipping and receiving, and customers and suppliers still demand access to their accounts.

Let's take the insurance business, for example. The applications you've built over the years have become ingrained and every policy or claim processed relies on those systems being available. Any significant moves or changes that affect application availability (such as a cloud adoption project gone wrong) will also affect the bottom line of your enterprise. You must keep your enterprise network and its heavily-used applications up-and-running during your cloud adoption.

To minimize the risk of failure, it is important to have the right people, process and partners contributing to your efforts.

### The Right People

Your current IT staff's understanding of the existing environment is tremendously valuable – they know the hardware, the applications, the programming languages, and how it all works together and it is not easily transferred to or picked up by someone else. They have the lessons learned and the well-earned battle scars that have resulted in the production systems.

Extending your IT ecosystem to now include cloud computing capabilities will require some new skills. Existing technologists should be able to come up to speed with training, pilot projects and time. However, only relying on your existing team means that there will be some on the job training, some new lessons to be learned, and some new mistakes to be made.

Of course, the other challenge is time – if your IT team is already fully utilized maintaining the current environment, what will they stop doing, so they can find the time to come up to speed on cloud computing, take on cloud projects and begin to manage and operate the expanded, blended enterprise and cloud ecosystem?

So, what are your options? Here are some thoughts:

**Supplement your existing IT staff for the interim.** That means bringing on some additional help to run your existing environment, keep your team in charge, but allocate a percentage of their time to net-new learning, projects and development. Take measured steps, make your transition and when you start to draw down your existing on-premise footprint and deploy new applications, you can start to draw down your supplemental staff, as well.

### RECOMMENDED STEPS FOR SUCCESS:



- Understand your current development environment and readiness for DevOps
- Understand your Operations Environment and readiness for DevOps
- Understand the current trends in your industry and the effect of rapid application readiness would have on your business
- Understand security requirements and what impact those may have on your cloud configurations, on-going costs, and managed service requirements.

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**Divide and conquer.** If you're familiar with Gartner's Bi-Modal model of IT, this may sound familiar. Assess your IT staff – identify one group to remain focused on the existing platforms (Mode 1) and identify a second group to focus on the new/ cloud platform (Mode 2). Some of your existing staff will be suitable for Mode 2. You'll need to backfill them on the Mode 1 team and you'll likely want to hire to build out the Mode 2 team.

**Buy the transition.** This is not going to be popular with the existing IT team, but you could outsource the bulk of the migration work. In the meantime, you identify who from your existing team will be on the "go forward" operations team and ensure they are cross-trained and ready to assume control after the new environment is up, running and populated with workloads.

Not everyone will make the transition. In this new world, the IT staff of the business no longer handles server hardware, datacenter environments, mainframe platforms, etc. You don't need engineers on 24/7 stand-by. You're buying all of that now with your "infrastructure-as-a-service". This means your "owned" IT staff requirements will change. You could reduce your staffing footprint or you could alter the mix to lean more heavily toward support for proactive innovation, DevOps, monitoring & management, etc.

You'll want to assess your existing staff and understand their skill sets---those that are crucial to the day-to-day operation of the existing enterprise and those that are available to help plan and execute the cloud adoption. Where there are gaps, find a good cloud adoption partner to assist you that understands both traditional enterprise and cloud computing.

### The Right Processes

While your own organization has probably built many internal processes over the years for accomplishing most IT projects, re-platforming applications to the cloud may be new and uncharted territory. The adoption of cloud may also offer the opportunity to change the way you develop software and operate IT within your business.

Historically, there was a chasm between the application development teams and the people responsible for monitoring and managing that application. It is not unusual for the dev team to simply "throw the application over the wall" when it had been tested and ready for deployment. It was then up to the ops team to figure out how to distribute it, how monitor it, and how to troubleshoot it.

DevOps uses a set of processes and methods for spurring collaboration and better communication between the aspects of various disciplines involved in implementing software (e.g. - requirements analysis, architecting, prototyping, iterative or agile development, quality assurance, etc.) Cloud computing can support and enhance agile development, and DevOps in many ways.

By including the "ops" team in the agile development cycle, the requirements and ability to monitor and manage those applications is being worked on at the same time as the application is being created. This gives the operations team a complete view into how the app is being built, the critical components that need to be monitored, and what to do when something "breaks".

New software tools and platforms are available in the market to help automate and streamline development, testing, releasing, and management of software. There are several cloud consultancies and managed service providers that have DevOps expertise and can bring these tools to your cloud adoption project.

### The Right Partners

There are many different types of companies that make up the cloud ecosystem. There are, of course, the cloud service providers (e.g. - Microsoft Azure, Amazon Web Services, Google Cloud Platform, etc.), and there are plenty of other companies that provide additional services such as managed service providers, cloud consultancies, cloud delivery companies, cloud assessment vendors, and any variety of cloud

### RECOMMENDED STEPS FOR SUCCESS:



- Look for a partner that understands your business and the actual value that these solutions are bringing
- Look for a partner that can automate as many of aspects of your migration as possible
- Look for a partner who can support both your on-prem and public cloud environments



specialty companies that it may make sense to partner with.

Not choosing a partner could overtax your existing staff and ultimately put your cloud adoption projects at risk for failure or even reduce the return-on-investment for those that are successful. Choosing the wrong partner could drive up the costs of your adoption projects and reduce your return-on-investment (ROI).

There are numerous service providers, software vendors, and consulting houses waiting to assist you in your adoption projects. But before you contact them, make sure you understand why you are hiring them and what you expect of them. Consider:

**The approach to your existing environment.** Be wary of the cloud consultant company that only wants to talk about moving everything to the cloud (“all-in” option) or limits the discussion to the tactical aspects of moving existing workloads. A great partner will seek to understand your entire, blended IT ecosystem – both enterprise and cloud – and propose prioritized solutions that make sense for the business.

**Experience in the areas that apply to your business.** No outside company will understand the specifics of your custom applications, but a general understanding of the hardware, the operating systems, the middleware, the business climate in which you operate is essential.

**The special ability to come up with innovative, viable solutions.** A cloud consultancy has seen how other IT organizations have adopted the cloud and may be able to help your organization innovate.

**Use of automated tools.** This can help replace some of the manual labor involved in documenting and understanding your applications and their interdependencies for purposes of the cloud assessment.

**Experienced in both On-Prem and Public Cloud Solutions** – There are many applications that are not cloud ready for a number of reasons. Can your partner work with you to support those applications that are staying in addition to those that are moving?

#### RECOMMENDED STEPS FOR SUCCESS:



### SUCCESS FACTOR: DEVELOP APPROPRIATE METRICS FOR GAUGING THE SUCCESS OF YOUR CLOUD ADOPTION

There are numerous reasons your organization may be undertaking the effort to migrate applications to the cloud. Some companies want to transfer their spending from OPEX to CAPEX and will use a sever refresh project as the impetus. Some may be looking at their scalability requirements driven by seasonal or other activities that have forced them to overprovision in the past, and want to take advantage of the cloud’s elasticity. For others, it may be a straight cost decision such as Dev/Test environments which can be turned off when not in use. Whatever your reason is for moving to the cloud, you should have the proper metrics in place to monitor the success of your project.

Some things to keep in mind are:

**Service Availability.** - There is a common misperception that once something is “in the cloud”, there is automatic backup, disaster recovery, and you no longer have to worry about your service going down and losing data. This cannot be further from the truth. When architecting your cloud environment, you must sill design for high availability and DR, including multi-region or at least multi-availability zone designs in the case of AWS. Most cloud providers will only offer a standard availability SLA of 99.99%. This still allows for many hours of downtime in a year. To protect your environment and your customers, you need to take these factors into account. These are not free and will add to the cost of your deployment.

- Understand your true costs before your migration
- Design for High Availability and make sure those costs are included in your estimates
- Continually monitor and optimize to save costs on your deployments.

Make sure that you are tracking this in you planning

**Response Time/Application Performance.** As more and more applications are moving to the cloud, your network connectivity becomes paramount. When designing your new architecture, you will have several options for connecting to your cloud provider i.e. Internet, VPC/Direct Connect/ExpressRoute. How you decide to connect to your cloud provider will have a direct impact on user satisfaction and the overall success of your project. There are several tools available today to help you monitor your application performance and user experience. This will be one of the key metrics to watch for the

**Capacity and Utilization** – One of the many advantages of moving to the cloud is its elasticity. The beauty of the Pay-for-what-you-use model is that you can always get more if you need it, when you need it. To get the most of your cloud deployment, you should always be looking at resource utilization from CPU to Memory, to Disk, and adjust monthly to move for example, to smaller instance sizes if you are only using less than maximum capacities.

**Cost per X.** There are many ways to optimize your costs when working with service providers. Instead of Pay as you go options, you can pay 1 year or even 3 years in advance with some providers which can provide substantial savings (up to 60%) over pay as you go models.

The cloud metrics that you standardize for your organization will help you compare how well your enterprise performs before and after cloud adoption as well as how well your enterprise measures up against other companies in the same or different industries. This could help give your business a way to measure your competitive advantages. It's a big task, so you may want to look to a managed service provider to help monitor, measure and manage your ecosystem.

## SUCCESS FACTOR: CHOOSE THE RIGHT CLOUD SERVICE PROVIDER(S)

As cloud adoption becomes more mainstream, the types of companies and the types of services available in the cloud ecosystem continue to grow and diversify. This ecosystem includes managed service providers, cloud adoption partners, cloud delivery partners, cloud consultancies, cloud integration companies, cloud brokers, cloud advisors, and many other third parties.

Let's look first at the Cloud Service Providers. A cloud service provider is a company that offers Infrastructure as a Service (IaaS), Platform as a Service (PaaS), and/or Software as a Service (SaaS) to other businesses. The most well-known public cloud service providers are Amazon Web Services (AWS), Microsoft Azure, Google Cloud Platform, IBM Soft Layer and Oracle Cloud.

While each of these providers have similar basic IaaS offerings, there are services offered by each one that are unique and may be a better fit for your business:

**Technology.** Does the cloud service provider use technologies that are similar or a good match for your IT infrastructure? Each of the major cloud providers have been releasing new services at an astounding pace. With the plethora of services available from the providers to address such services as databases (structured and unstructured), mail, development environments, big data and analytics platforms, even Desktop as a Service, it is important to understand your current and future needs along with the service offerings and benefits of each provider.

**Agility.** One of the other major considerations of choosing your cloud provider is vendor "lock in". In other words, once you have moved workloads into the cloud, how easy is it to move those workloads to another cloud service provider, or even back on premises, if you have a reason to do so? Some vendors make this much easier to do than others.

**Security.** Ask the potential provider to share their policies and practices for how they secure their networks and the data in them; ask them how they can ensure the integrity of your valuable data. Do you have industry specific data security requirements such as PII, HIPPA, or ITAR? Does the cloud service provider have options for these specific scenarios?

**Pricing.** Different cloud service providers offer different pricing models. Some bill on number of virtual machines, or software licenses, or platforms, etc. Some may give you a fixed price for everything. There are several tools and technologies available to help you understand comparative costing between providers. You will also want to evaluate your possible discounts by looking at paying up front for some of your required infrastructure. Most of the major cloud providers have these options.

**Service level agreements.** Can the provider meet the needs of your operating environments?

Of course, in addition to these Cloud Service Providers, should you use a cloud consulting company to help you analyze your requirements and help you on your journey. There are many reasons to do this. Many of these consulting companies can help you speed your journey to the cloud. They can help you in multiple steps along the journey.

**Assessment** - A cloud consultancy should have automated tools to help you rapidly assess your environment, map dependencies between systems and applications, and build move groups. They will also be able to help you with which applications should stay put.

**Migration** – A Cloud Consultancy should have people, processes and tools to help you rapidly migrate your workloads to the cloud with zero impact to your business and zero downtime. There are also incentives available on occasion from some cloud service providers that enable a consultancy to provide significant discounts to customers to migrate them to their cloud.

**Pricing** – Procuring your Cloud Infrastructure through a cloud consultancy may also provide benefits. By bundling in consulting and operations services, there are often price advantages to procuring your cloud infrastructure through a consulting partner.

**Monitoring/management systems.** While many of the requirements for monitoring and managing a cloud based infrastructure are similar to managing your on-premise infrastructure, there are also some major differences. A managed services provider not only should be responsible for monitoring the stability of your instances, but patching, updates, application performance management, automation, orchestration, and cost optimization are all services that should be available to you. Continuous monitoring of your cloud based spending is of particular importance. With the constant change in available services and pricing, it is paramount to track your usage and always be ready to optimize by changing instance sizes, storage types, or even cloud service providers to maximize savings. By working with a cloud consultancy who can help with both your on-premise and cloud based infrastructure, there are many advantages to be gained.

Researching the Cloud Service Providers may seem like a daunting and confusing task. However, there are clever and useful tools available to help you make the right call.

*"The right tools can find the best fit for your cloud needs for a savings of 40-50%, while also accelerating your time-to-cloud but up to 60%."*

- Adi Rao, Partner Development Manager at Cloudamize

In fact, you are not limited to choosing a single cloud service provider for all your application needs. It may be that the best solution requires using more than one cloud service provider because it takes more than one to meet all your criteria.

Perhaps you use one provider for a given application, but decide to use a different provider for another application. And in many cases, using multiple cloud service providers can offer the advantage of gaining real working experience that can then be used to determine which provider would be the best fit for which future applications that you will decide to move. Working with more than one cloud service provider certainly enhances your bargaining positions with the providers.

#### RECOMMENDED STEPS FOR SUCCESS:



- Understand your applications, dependencies, and true cost of ownership
- Research what is available from the cloud service providers and the true TCO from them
- Choose a cloud consultancy who can maximize your value and speed your journey to the cloud
- Continuously monitor and optimize your migrated workloads to maximize savings

## SUCCESS FACTOR: CONSIDER BUSINESS TRANSFORMATION DURING AND AFTER CLOUD ADOPTION

While looking toward the cloud, you will inevitably inventory, evaluate, assess and prioritize the various applications that are used to run your business. This discipline is sometimes referred to as Application Rationalization (AppRat), as part of Application Portfolio Management (APM), a framework for managing enterprise software applications and software-based services.

In fact, understanding the portfolio of applications and how they relate to the business can also be a fundamental component to assess a cloud adoption project. You might find that you have overlapping applications performing like or similar functions which creates opportunities for eliminating some of them and saving some costs.

It will be great if every application you've developed since the beginning of your enterprise has been kept up-to-date with the latest hardware platforms, operating environments, and software languages. You're using the latest standards, your applications are all portable, distributed, and agile and everything is running perfectly!

In reality, all applications have their shortcomings and perhaps during the assessment phase of your cloud adoption project, you find that in addition to eliminating some and updating other applications, specific improvements might serve as an enhancement to the actual way your business is conducted.

This is where DevOps comes into play. Many organizations use their move to the cloud to adopt DevOps processes into the application development streams. By more closely aligning your company's development and operations teams and integrating the operations group into your agile processes, it will allow for much faster time to market for your new company applications. Using Continuous Development, Continuous Integration, and Continuous Operations workflows, enable your applications teams to fail faster, fix faster, deploy faster, and understand how to properly manage those applications once they are deployed.

For example, just a decade ago, banks were investing heavily in drive thru teller windows, so that their customers could make a deposit without having to get out of their cars and walk into a bank branch. But now, just a few years later, banks are no longer investing in these drive-thru teller windows, because with mobile banking apps, their customers expect to be able to make that deposit without ever leaving the house!

Mobile deposits are an example of transforming a customer experience by leveraging the latest technology capabilities. It started with a mundane, ordinary banking process (deposits) and reimagined how much better that experience could be, taking advantage of smart phone to provide benefits to both the bank (less employees and buildings with drive thru teller windows) and to the customer (convenience, instant gratification). In fact, smart phones, tablets, sensors and other smart devices are providing the necessary endpoints to drive transformation in almost every business sector imaginable.

### Overcoming the Drag of Legacy Systems

Do you still have mission critical applications running on mainframes? Business rules and logic embedded in programs written decades ago? It can feel like you're running with an unfurled parachute attached to your back – while that helps Olympic track athletes build strength and endurance, in business that drag will hold you back.

In order to really drive impactful and meaningful change, the reimagined customer experiences, business process, etc., still need access to the data and applications that continue to run on legacy systems such as:

- Hardware – IBM, Unisys, Tandem, DEC, Bull, Stratus
- Operating Systems – Z/OS, IMS, MCP, OS2200, VAX, VMS
- Languages – COBOL, MAPPER/BIS, LINC, Assembler, JCL, WFL, REXX
- Databases – DB2, IMS, IDMS, DMSII, ADABAS

Many of these legacy applications are being replaced with newer object-oriented languages some, while others such as COBOL (a language created over 50 years ago), still run a high percentage of the daily business transactions throughout the world. There are various strategies with varying degrees of risk and cost to modernize your legacy systems – three core approaches include reuse ("lift and shift" or re-platforming), rewrite (write replacement applications from scratch) or replace (implement a third-party solution, typically a Software-as-a-Service (SaaS) offering).

Even if you are currently okay with your legacy systems, the talent pool to continue supporting the hardware, operating systems and programming languages is shrinking rapidly. You may find that diminishing skill availability becomes a driver in modernizing your old systems sooner than later.

One final thought - a key driver behind legacy modernization, which can serve as a catalyst to business transformation, is the cost of hardware maintenance renewal contracts. The recurring costs continue to climb with no workable options available short of making a major platform change.

### Business Transformation – During or After Cloud Migration?

Whether we're talking about legacy mainframe applications and data or those running on more modern systems in your datacenter, the decision must be made on when to engage in business transformation.

The potential for business transformation is only one of the benefits of cloud adoption. Others include cost model optimization, performance and reliability gains, focusing IT on innovation versus maintenance, etc.

You may decide that to divide your efforts into smaller, more manageable parts makes more sense. For instance, you may assess your on-premise Windows and Linux workloads, group and prioritize them, and move their mirror images to virtual instances in your preferred cloud vendor. This type of project can happen rapidly (weeks to a few months), in waves of effort and with minimal to no discernible disruption to the end user experience (whether it's customers, employees, partners, etc.)

Taking this approach means you can start benefiting from cloud computing quickly. However, it has also been said that the result is "your mess, for less" – in other words, any issues, bugs, poor architecture, etc. is migrated right along with the applications.

As an alternative – you can take a longer, more risk-prone approach of not moving the applications, but rewriting or replacing them with something new. The first hurdle here is related to data transformation from the old format to something workable with the new solution. This is not a major obstacle, but does introduce complications and effort not present in a migration of an existing workload.

The most significant challenge – and it is formidable – is capturing and recreating the business logic and business rules represented in the old applications. In Astadia's over 25+ year experience, we have been called in numerous times to rescue "rewrite" projects that had dragged on for years, gone way over budget and still not achieved their purpose.

What's the right answer? It depends. The actual path you take is likely going to include mirroring a number of existing workloads that work just fine, can be moved with minimal fuss and a change in the application wouldn't have an appreciable impact on revenue, performance or customer satisfaction.

It is also going to include selecting those initiatives that have trajectory- and velocity-changing potential. Ask yourself – if we weren't shackled by any constraints; if we challenged every assumption, slayed every dragon...; if we attacked our market from scratch, as a well-funded Silicon Valley start-up, how would we do it? Where are the opportunities to re-define the customer experience? Blow-up and create new revenue models? These answers will lead you to an understanding of where to invest the funding and intellectual heft of your development efforts.

Take advantage of this moment to identify a wide cross-section of disciplines in your organization with an expert understanding of your market; poll your customers and your partners; evaluate the leaders and the laggards in your industry. Build your own skunk works, empower them to iterate rapidly, allow them to fail small and fail often (make many small bets to determine what works, then double down).

### RECOMMENDED STEPS FOR SUCCESS:



- Conduct a meaningful application portfolio rationalization balanced with business needs and determine which experiences and process need to be transformed to have the greatest impact on customer satisfaction, employee productivity and the bottom line.
- For those experiences and processes that need transformation, identify contributing and dependent applications and services and determine if there is immediate value or minimized risk in taking a "lift and shift then transform" approach vs. truly needing to transform the application to realize measurable impact.
- Make several small bets, transform subsets of a process. You may decide to leave the data in its current location, but build new customer and employee experiences, for instance.



## 7 CRITICAL SUCCESS FACTORS FOR CLOUD ADOPTION

*"A cloud development environment simplifies your ability to rapidly develop and test great software; it's an enabler for speeding up that process and simplifying the entire software development lifecycle (SDLC)."*

- Will Hurley, AVP, Software Lifecycle Services, Astadia

In effect, the cloud allows you to experiment and develop the new processes and technologies without having to commit to them. And while you're developing your new applications on the cloud, you're only paying for the small development and testing environment that you're using; not for a whole new development and testing infrastructure.

The very real potential of business transformation can be realized with cloud computing. It should be approached with an extremely open mind, balanced with the realities of minimizing risk while maximizing impact.

## CONCLUSION

If you haven't begun your journey with cloud computing just yet, chances are that a cloud adoption project is in your near future. While the cloud has come a long way in a relatively short period of time, the services they offer continue to expand and offer new capabilities at an astonishing rate.

There are many success factors for cloud adoption that help ensure you achieve maximum return on your investment and we're glad to have shared several with you through this whitepaper. You have a long journey ahead of you and we'd encourage you to share it with travel companions from your community of customers, partners and employees. You may need to add to your ecosystem and should that include Astadia, we'd be honored to join you.

Please feel free to reach out with any questions, comments or feedback to [SuccessFactors@Astadia.com](mailto:SuccessFactors@Astadia.com).

## ABOUT ASTADIA

Astadia is a premier technology consultancy focused on maximizing the impact and minimizing the risks of today's blended enterprise and cloud ecosystem.

Our focus areas include:

- Cloud Migrations – Moving enterprise workloads to target cloud environments to optimize costs, improve reliability and free-up resources to focus on innovation.
- Legacy Modernization – Assess, identify and modernize mainframe-based applications and databases, whether through reuse, rewrite or replace.
- Managed Services – 7/24 visibility and support for the blended IT ecosystem, including enterprise, cloud and end users.
- Cloud Development – Design, build, test, secure and deliver great software for today's elastic, hyper-scale world.

Clients choose Astadia for our 25+ years of experience, our agility and our emphasis on delivering results that matter.

How can we help? We'd love to hear about your cloud adoption journey. Email us at [SuccessFactors@Astadia.com](mailto:SuccessFactors@Astadia.com).

<sup>1</sup> Network World article, March 2, 2015, "The myth about how Amazon's Web service started just won't die – how AWS got started," by Brandon Butler. <http://www.networkworld.com/article/2891297/cloud-computing/the-myth-about-how-amazon-s-web-service-started-just-won-t-die.html>

<sup>2</sup> Data Centers in Flux: The IT Optimization Challenge, Q3 – 2016, DataLink & IDG Research Services

<sup>3</sup> CompTIA, Trends in Cloud Computing, September 2016

<sup>4</sup> Peter Mell and Timothy Grance (September 2011). The NIST Definition of Cloud Computing (Technical report). National Institute of Standards and Technology: U.S. Department of Commerce. doi:10.6028/NIST.SP.800-145. Special publication 800-145.