Intraprise

A 3 PART SERIES ON
CLOUD COMPUTING

EBOOK:
CLOUD COMPUTING

YOUR GUIDE TO THE CLOUD IN TODAY'S DIGITAL ECONOMY

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A NOTE FROM THE AUTHOR

Words Matter

I recently published a piece titled, “Key Words and Tricky Phrases” that focused on the nature of certain IT jargon. In my piece, I shared an observation I’d made while reading comments from 15 healthcare executives surveyed for a July, 2021 Becker’s Hospital Review post. I realized that the annoying, cringe-worthy nature attributed to certain IT jargon was not derived from the actual words and phrases but rather how certain terms, relatively new to our vernacular, are used. For me, “the cloud” is such a term. I find myself annoyed by its use, not because the term lacks valid and valuable meaning, but because it is used (and misused) in so many different ways that its true meaning is obscured, lost, and misunderstood.

It’s worth noting that terms like “the cloud”, “AI”, “big data”, and “IoT” (short for “Internet of Things”) happened to also make the healthcare executives’ cringe-worthy list of annoying IT jargon mentioned above. I get it. New terms and phrases with specific meaning are twisted and turned upside down to fit fancy marketing messages designed to capture a moment of attention from decision makers and their advisors.

Our vernacular continuously adapts to effectively describe new innovations fueled by increasingly rapid and significant advancements in digital technologies. That is a good thing, critical to progress. When it comes to all the new IT jargon, I try to tease precision from the noise generated by fancy messaging and confusing narratives.

I think of the cloud as today’s manufacturing center - the place where things are made and value is created. In the spirit of precision over messaging madness, focusing on “the cloud” is a good place to start.

Meet the Author

Todd J. Fisher, Intraprise’s Chairman and Founder, is a three-time CEO; in his 30 years of experience, he has created innovative information technology solutions, supporting the most demanding environments. While two of his businesses operate in their original forms, one was sold to Siemens Health Services after two years and 400% growth.

Before his career as an entrepreneur, Todd was commissioned as an officer in the US ARMY’s Signal Corp. While on active duty, he was assigned to the 1st Special Forces Group, where he proudly served for four years.

Today, Todd passionately researches, writes, and advises on Digital Transformation and it's role in today's economy.

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PART I:

AN INTRO TO THE CLOUD

Talking About the Cloud Around the Virtual Water Cooler

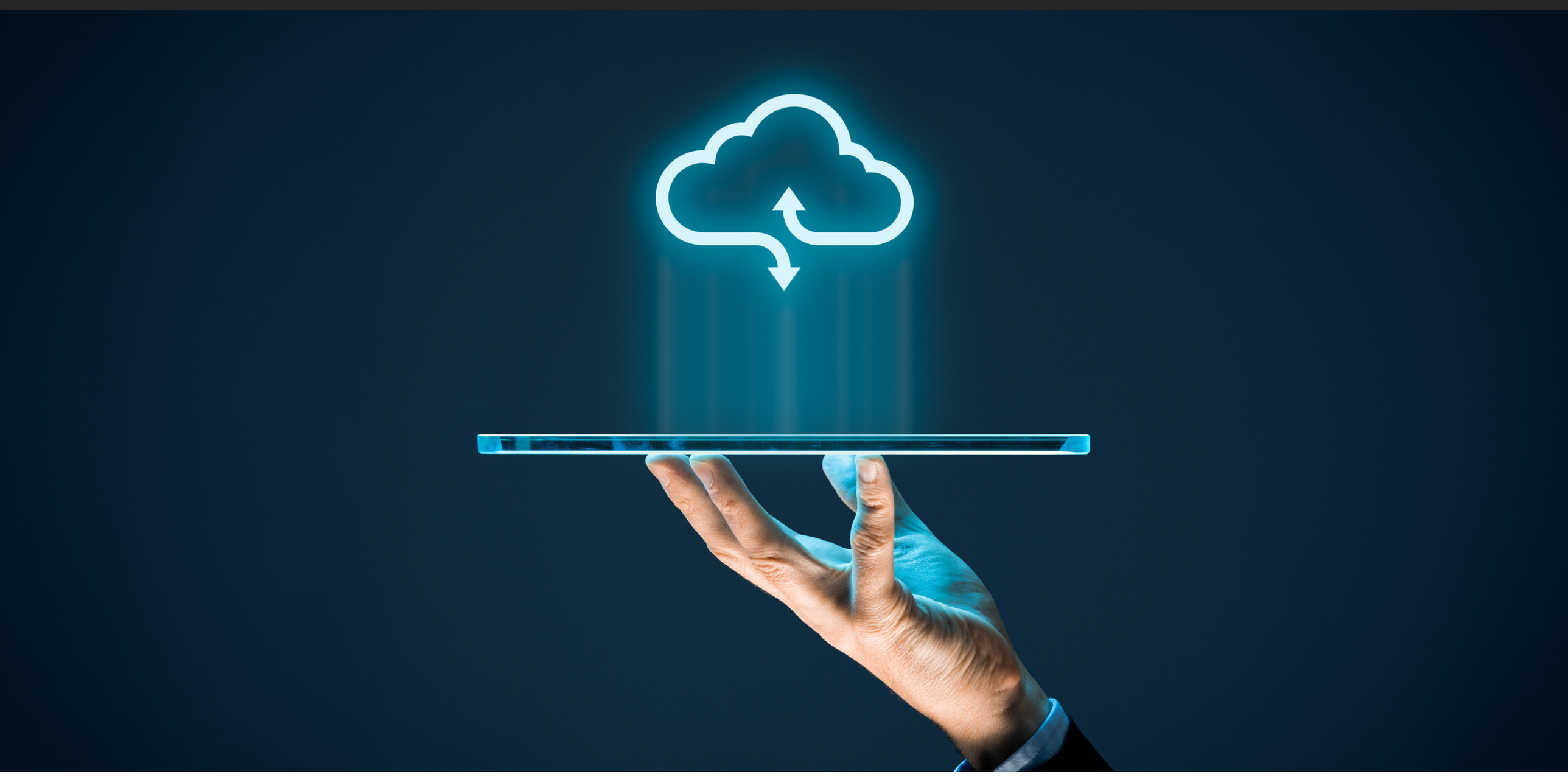
Have a discussion about information technology today in a group of three or more participants and someone in the group is going to mention “the cloud.” My experience has taught me an important lesson: in such discussions, it is important to consider whether all the head shaking conveys the message, “yes, I’m tracking what you’re saying” or “yes, I hear what you are saying and don’t really understand, but need to fake it until I catch up.” Why, you might ask? In short, context matters, and I will discuss how and why context matters in parts two and three of this series. For now, it is most helpful, I believe, to start with the basics.

What, exactly, is “the cloud”

At its most basic level, “the cloud” is a technology architecture that depends on two main components: 1. **Data center(s)** that house data storage and compute capacity connected and secured behind one or more protective layers of cyber-security, and 2. **A sufficiently robust connection to the Internet**. The Internet serves as the means of transporting data and software capabilities to those authorized and able to connect to some or all of the data storage and computing capacity available in a given data center. When a person or organization takes advantage of “the cloud” in a small way (gmail only) or in a big way (the cloud serves all computing needs) cloud computing is the result.

I think it is worth hitting pause here to highlight that the basic level description above is the manifestation of a concept. Confusion and complexity reside in the myriad ways individuals and organizations can engage in cloud computing.

WE HAVE TO START SOMEWHERE.



Cloud Computing

The different ways we can engage with and leverage “the cloud” is the proverbial “secret sauce.” As a technology architecture, “the cloud” is not a one size fits all thing - not even remotely (pun intended). On the contrary, “the cloud” offers various cloud computing options that can be assembled and reassembled like a set of legos.

Through the combination of specific cloud configuration options (e.g., public cloud, private cloud, and hybrid cloud) employed to subscribe to one or more cloud-based business models (IaaS, PaaS, and SaaS, for example), the cloud offers an enormous number of options capable of serving a very diverse set of needs. When I think about my lego metaphor, I am reminded of one of the most relevant and valuable attributes of “the cloud” - hyper-adaptability.

Lost in the Clouds

And this is where many discussions about “the cloud” cannot be understood without context. What manifestation of “the cloud” is in use and why? There are good and valid reasons to choose any one of all the possible ways in which the proverbial legos can be assembled. What specific options - the good, bad, and ugly (or good, better, and best) - exist with each? That’s up next.

PART II:

THE BUILDING BLOCKS

Elements of the Cloud

I have read countless articles about "the cloud." Over the past two years or so, a pattern has emerged: many articles and posts discussing aspects of cloud computing benefits, strategies, and considerations are missing helpful context to provide the reader a common starting point. Instead, we're "flying blind," as in flying through bad weather without the benefit of accurate orientation. To be clear, I have benefited a great deal from valuable insight and wisdom in many of the same articles and posts. But absent a commonly shared (even if assumed by the author) starting point, terms and phrases with real meaning take on a life of their own.

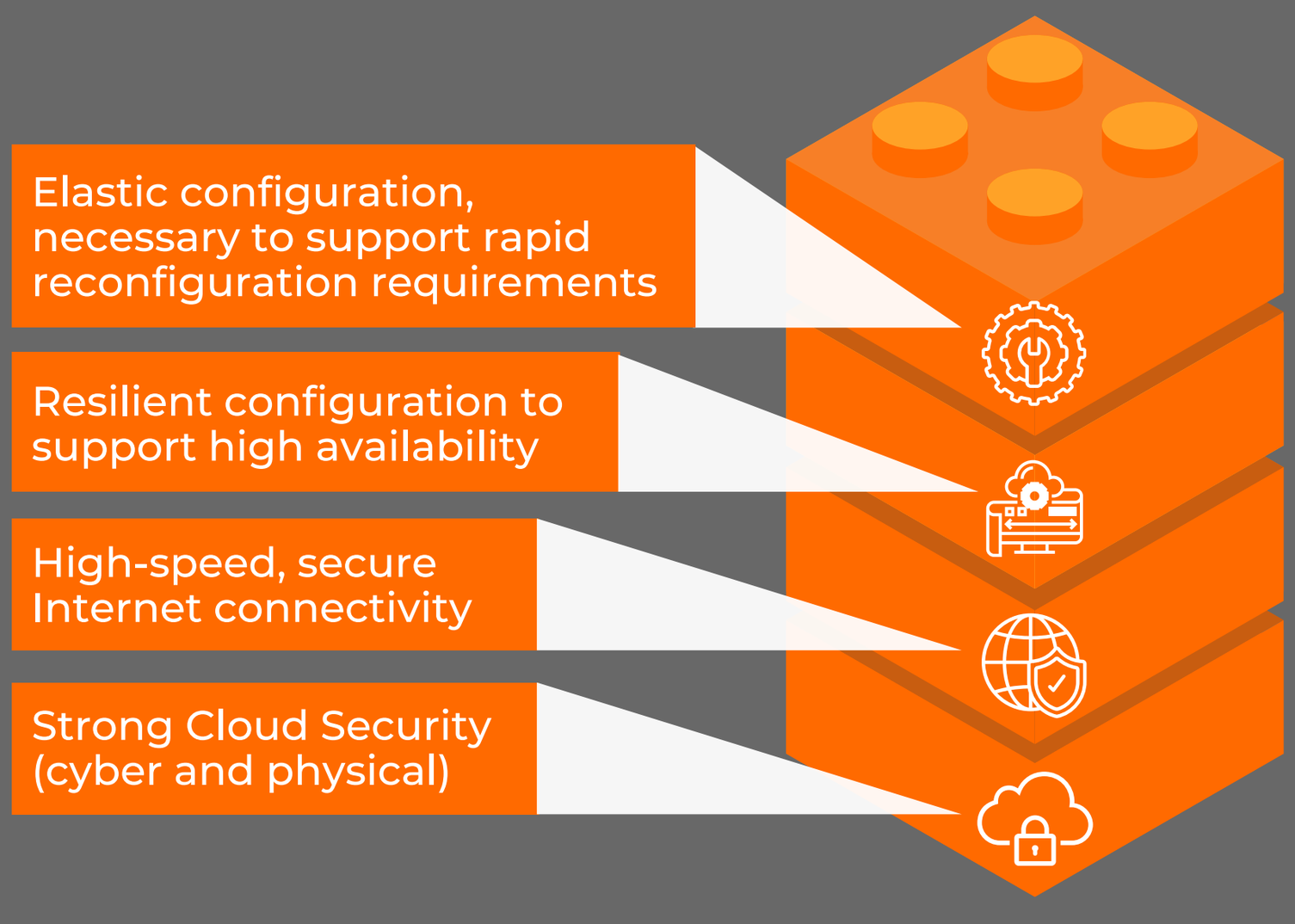
A visit to Legoland

"The cloud" is not a one size fits all thing. The magic is in how various combinations of configurations and service types are assembled and deployed in support of a given business. So, what Lego pieces are available in today's cloud?

To answer that question, it's useful to refer to the National Institute of Standards and Technology (NIST) definition of cloud computing, and specifically what NIST feels are the important components of "the cloud model." To support their definition, NIST suggests the components that compose the "cloud model" include Essential Characteristics, Service Models, and Deployment Models (what I choose to refer to as Configuration Options).[1]

ESSENTIAL CHARACTERISTICS OF CLOUD TECHNOLOGY

The future of cloud is limitless and a majority of businesses have already incorporated cloud computing into their strategy. However, in order to succeed through cloud adoption, organizations must find the right combination of elements to optimize their strategy and satisfy their unique needs.



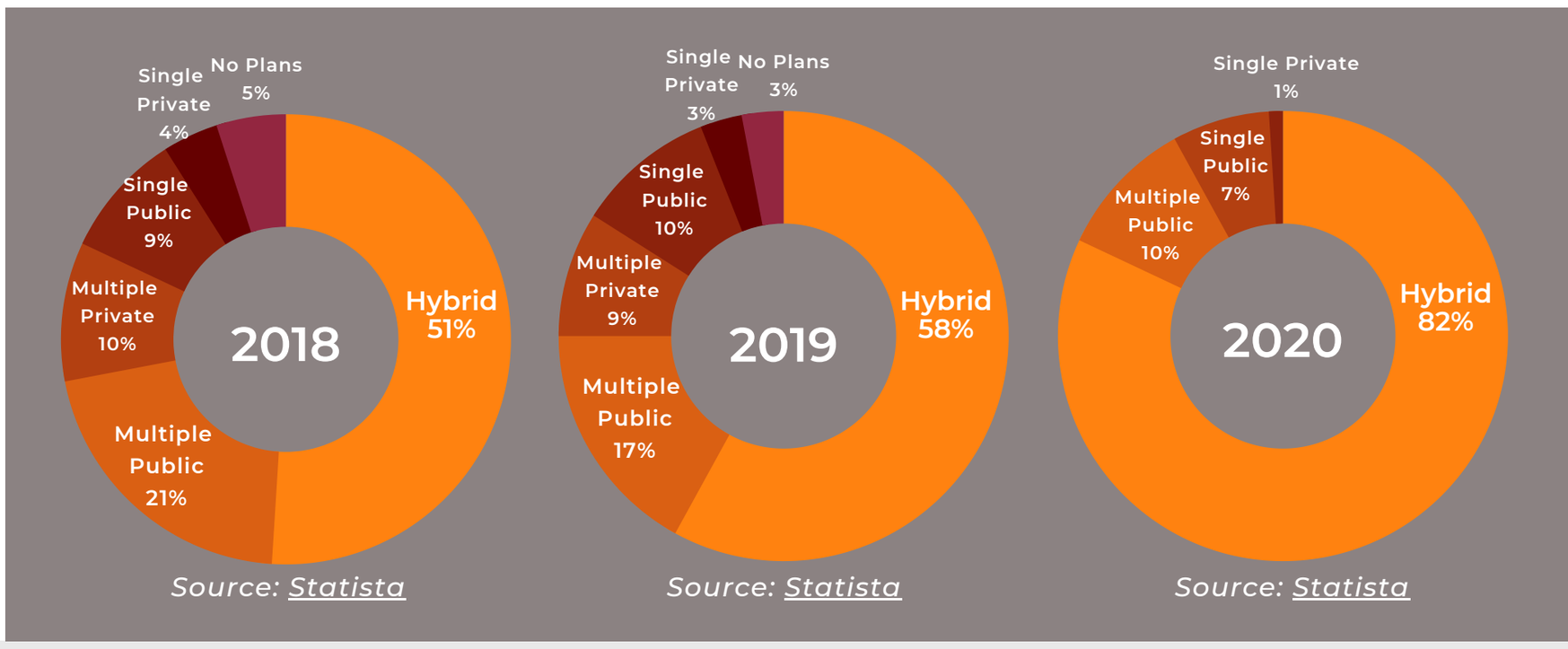
[1] NIST Special Publication 800-145 - The NIST Definition of Cloud Computing

WHAT DO LEGOS HAVE TO DO WITH THE CLOUD?

CONFIGURATION OPTIONS

As the global digital ecosystem continues to change at a torrent pace, the number and type of cloud computing configuration options continue to evolve. The most commonly used and discussed options are listed below. Comprehensive descriptions of each configuration option below, as well as emerging alternatives can be found on IBM's Cloud Learn Hub under Cloud Computing Types:

- Public
- Private
- Hybrid
- Multi-cloud
- Multi-cloud hybrid

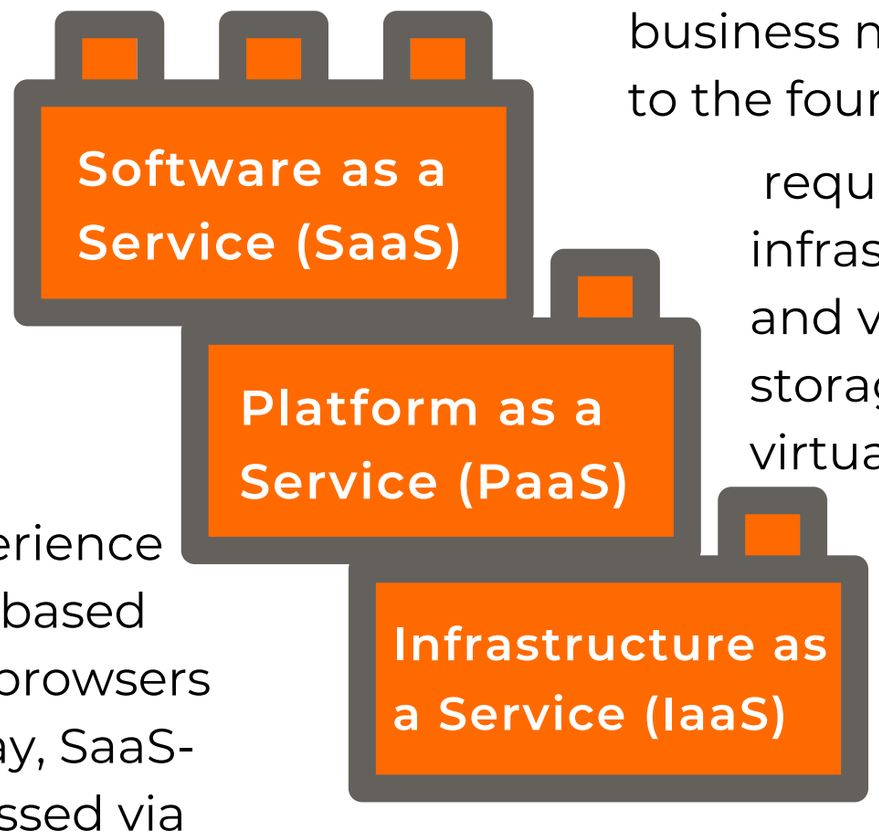


SERVICE MODELS

Software as a Service (SaaS)

Commonly used without even realizing it (e.g., gmail), SaaS refers to software residing in "the cloud" where it is centrally managed, updated, and controlled. Applications offered via the SaaS model are most often paid based on a subscription-based pricing model.

Advances in browser technology and web-based integration and interoperability have enabled SaaS-based application software to offer increasingly broad user experience options. No longer are SaaS-based applications limited to web browsers running on computers. Today, SaaS-based products can be accessed via mobile, desktop, browser, and native OS dedicated desktop software.



Platform as a Service (PaaS)

The PaaS model has helped democratize even the most sophisticated software engineering requirements by moving the cost and complexities associated with a collaborative, multi-OS, multi-technology, multi-development tool environment to the cloud where the cloud service provider hosts everything necessary to support a complete development and testing environment.

Infrastructure as a Service (IaaS)

The first foray into a true cloud service business model, IaaS offers just-in-time access to the foundational components required of a digital technology infrastructure such as real (i.e., physical) and virtual servers, networking, and storage. The service industry is possible virtual servers, networking, and storage.

The service delivery is possible because the infrastructure components are securely connected to the Internet for remote access.

As with SaaS and PaaS, IaaS offers usage elasticity so businesses can scale their infrastructure environments up and down as required, paying for usage. Given the right skill sets within the business using an IaaS offering, organizations that may not have previously been able to purchase expensive high performance computing technology, for example, can now take advantage of the IaaS model's reliance on economies of scale.

The descriptions offered above can be found on IBM's Cloud Learn Hub under Cloud Computing Services.

WHAT DO LEGOS HAVE TO DO WITH THE CLOUD?

Why play with Legos at all?

There is potential to reduce IT costs substantially and in the short term. Prior large capital expenditures required to maintain a full IT capability from infrastructure to application development can be largely mitigated, replaced by flexible subscriptions designed to scale up and down with the customer's needs.

In a field of rapid onset of obsolescence – why purchase excess capacity that will sit unused for extended periods of time? The elasticity afforded by cloud computing models enables rapid adaptability and no capital depreciation.

The challenge facing businesses considering migration to the cloud rests in determining how to optimize the various combinations of options to shape a coherent cloud computing strategy. Each business has unique needs and therefore must consider the options carefully.

In other words, there are many ways to assemble "the cloud" model's Lego pieces, but not all combinations are optimal, and the right combination is highly dependent on the specific considerations and priorities unique to each business' needs.

PART IIIA:
A FORECAST ON CLOUD COMPUTING

A Forecast

Cloud computing strategies will likely land on a much more focused and optimized adoption of Public Cloud deployment models with a combination of SaaS and PaaS service offerings, all bundled to deliver most computing needs. More on that coming soon.

But First, A Necessary Detour

Designing a sound business strategy in today's fast paced digital universe requires hyper-adaptive thinking and a willingness to listen, learn, and challenge assumptions.

More so now than ever, business leaders and strategists are challenged by a new reality – an exponential acceleration in the rate of change. Today, the future is twice as close as it was yesterday and half as close as it will be tomorrow.

The accelerating rate of change and the nature of that change is outpacing much of the "thought leadership" offered by perfectly well-meaning and very capable professionals. And I am not immune to the same challenge.

I am also humble and rabidly curious, and that drives me to challenge what I assume to be true – a form of diligence. When preparing the third part of this series, I challenged many assumptions, including my own. Much of what I realized while performing that review over the past few months is anchored to assumptions and opinions that are really the exhaust of tradition, inflexible thinking, and certain innate biases we all have. Those assumptions often shape opinions that, over time, become etched in stone with the help of confirmation bias.

My plans were big and when I started the series, my expectations for Part III were predicated on assumptions and opinions I held at the time I conceived of the series.

Spending a bit of time focusing on my journey to better understand The Cloud deserves attention, because the lessons and insights learned are valid; they could improve your perspective, enhance awareness of hidden biases, and result in a more adaptable, dare I say, "future proof" approach to cloud computing, and ultimately digital transformation.

Our identity should be tied to our values and not our opinions.

- Adam Grant

Intraprise has been guided for 25 years by four core values: curiosity, humility, perseverance, and empathy. Those values have served us well. When I started working on this three-part Cloud series, I saw a path paved by each of the three parts. Part I established basic definitions. Part II established the myriad cloud deployment and service model combinations from which leaders must choose to build a cloud strategy optimized for a particular company.

THE JOURNEY MATTERS

I drove on along this path and used Legos as metaphorical building blocks, implying that the sheer number of combinations from which to choose makes for a highly complicated process when designing a cloud computing strategy. I ended Part II, in fact, with the following paragraph highlighting what was to follow:

Part III will focus on ways to evaluate the myriad alternative cloud migration strategies available… You've got the foundation, and now you've got the Legos. Stay tuned to learn more about how to put them together.

Knowledge -- Trust But Verify

I was ready to discuss the myriad ways in which cloud deployment and service models could be combined in different ways to optimize an organization's cloud computing strategy and design. I approached this final piece in our series prepared to create various diagrams and multi-dimensional matrices to deliver a prescriptive type of post intended to explain which Lego pieces are best connected in what order to tailor a strategy unique to and optimized for any given organization. The final part of the series would bring it all together in a manner that I hoped would be useful across all types of organizations. I thought of it as a guide to the mass customization of cloud migration strategies in quantities of one uniquely optimized plan per organization. I needed to tie something complex up, nice and neat – my Legos metaphor would dull the sharp edges of the topic's complexity.

"Keep things as simple as possible and no simpler."
- Albert Einstein

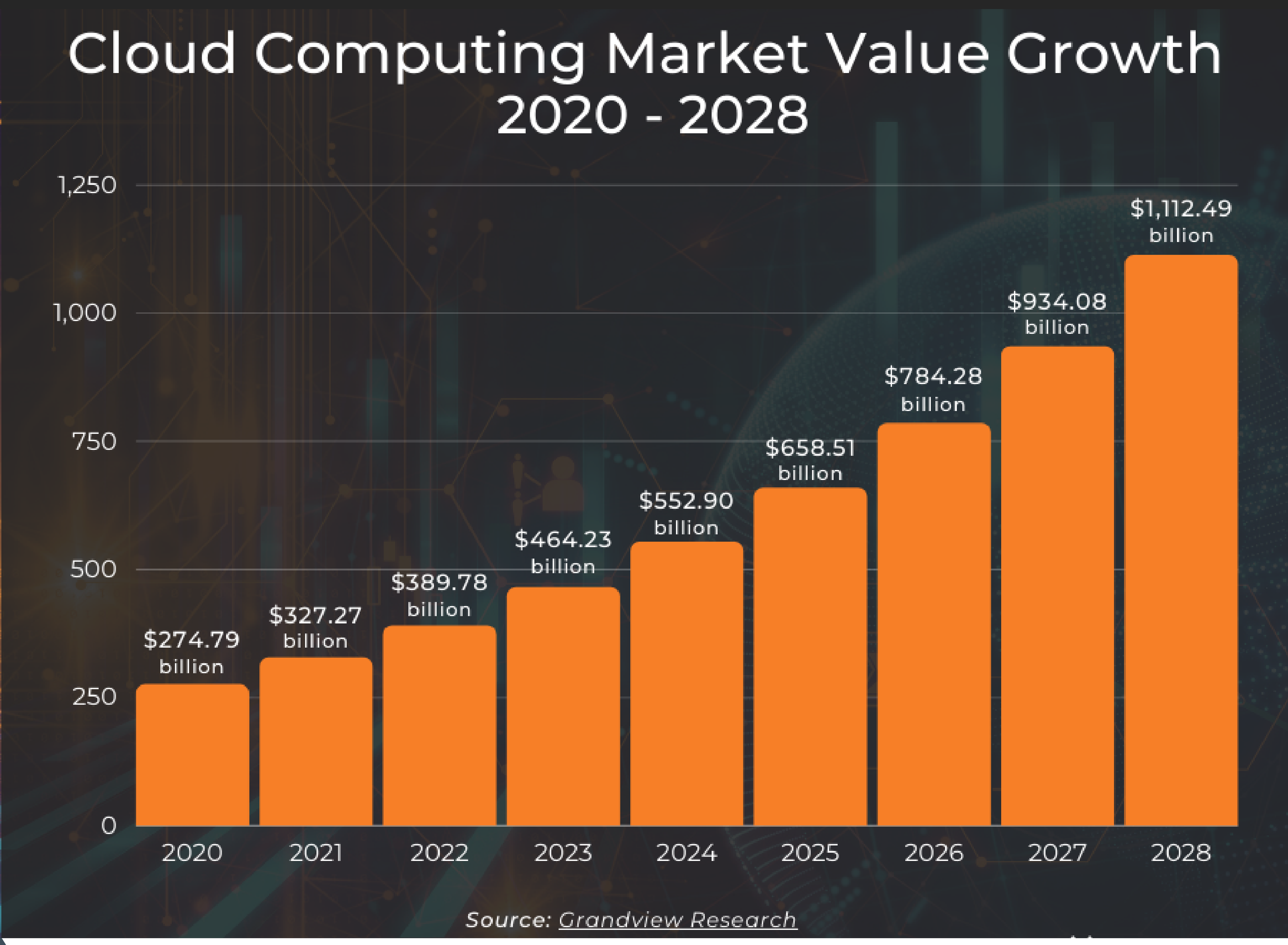
I refreshed my combinatorial math skills, which is to say I asked my brother/business partner (who happens to be a skilled mathematician and formally trained math teacher) to remind me which rules applied when calculating the number of possible combinations of multiple items that can be formed from multiple sets of varying numbers of items and constrained by a diverse array of criteria. Regardless of that number, in my research I consistently found legitimate evidence and compelling rational arguments that challenged what I had learned previously about the state of the art in cloud computing.

I took a step back, hit the pause button, and challenged my thinking. Was I trying to serve the purpose of our Knowledge Exchange with helpful information and insights? Or was I so invested in what I thought was the right path to follow when I first conceived of the three-part series that I was driven by a confirmation bias that left me with a blind spot I needed to address.

"Mistakes are the portals of discovery."
- James Joyce

At the outset, my vision for the series gave rise to an approach that I genuinely believe served our visitors well. Part I and Part II of this series offered meaningful and relevant information that remains valid.

THE JOURNEY MATTERS



Finding the Joy

In his recent book, Think Again, Adam Grant recalls a discussion with Nobel Laureate Daniel Kahneman; they discuss the idea that it is possible to find joy in the moments when you are proven wrong, because you have learned something new in those moments. You're immediately less wrong than you were the moment before. Call it flexibility, adaptability, or plasticity. It's where I have found myself in publishing this series on The Cloud.

Humility and curiosity, in these moments of being wrong and accepting new insights, conspire to create organizations that are well-equipped to develop a sound cloud computing strategy and design approach best able to thrive during disruptive periods of rapid change.

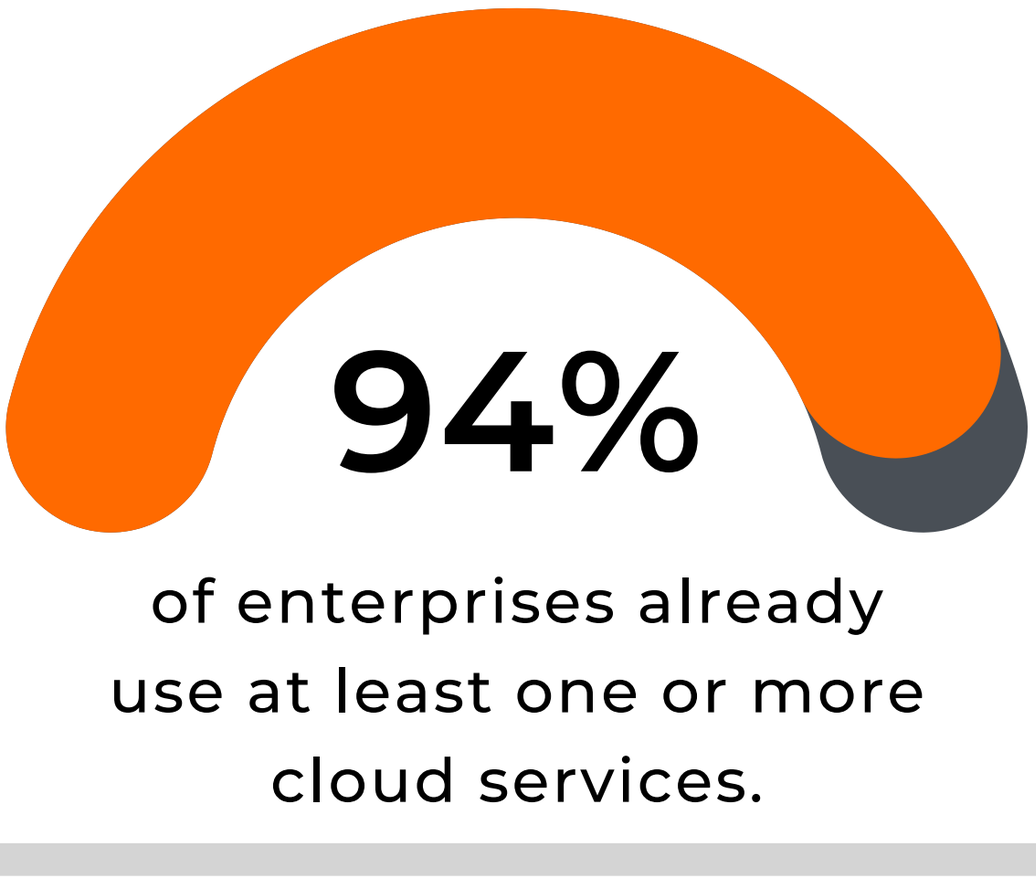
PART IIIB:
THE GOOD THING ABOUT CHANGE

Another Forecast

What is to become of the boom in the hybrid cloud model (combining private and public cloud deployment models to accommodate specific needs)? Let's consider what we mean by hybrid. I believe we will see a speedy evolution of the definition and reality we now think of as 'hybrid cloud'.

The public cloud (driven by CSPs with the capital and know-how) will continue to evolve. New specialized technology firms will enter the market, funded by all flavors of investment because of their synergies with the larger CSPs. The public cloud will evolve into what looks like the "hybrid model" now but instead of private – public configurations, the public cloud will include under its umbrella the edge computing segment, with localized, smaller data centers and computing environments designed, developed, and supported by the CSPs and new market players.

This is more akin to the power utility model with local service providers supporting the tailored needs of different industries, market segments, and individual organizations. Such an evolution is more consistent with how markets evolve, generally. This model will be able to solve for any perceived gaps in capabilities, coverage, and performance degradation created by the explosion of devices connected to the IoT – e.g., edge computing.



In this world of swirl, disruption, and blurred lines separating fact from opinion, it is important to remain clear-eyed and focused on the path you're currently traveling and where you are heading. It is equally important to continuously ask yourself "why."

There is an inherent challenge in forming an optimal cloud strategy and approach from a fresh perspective. The answers to questions around "what" cloud deployment and service models make sense and "how" to assemble the seemingly infinite Lego pieces to create the optimal solution are relevant – sort of. In this context, what and how are addressed in the now – they are only relevant as a snapshot in time. This perspective fails to see and consider the on-going, continuously changing digital ecosystem in which your business now exists and must continuously adapt to survive and thrive.

THE FUTURE OF THE CLOUD

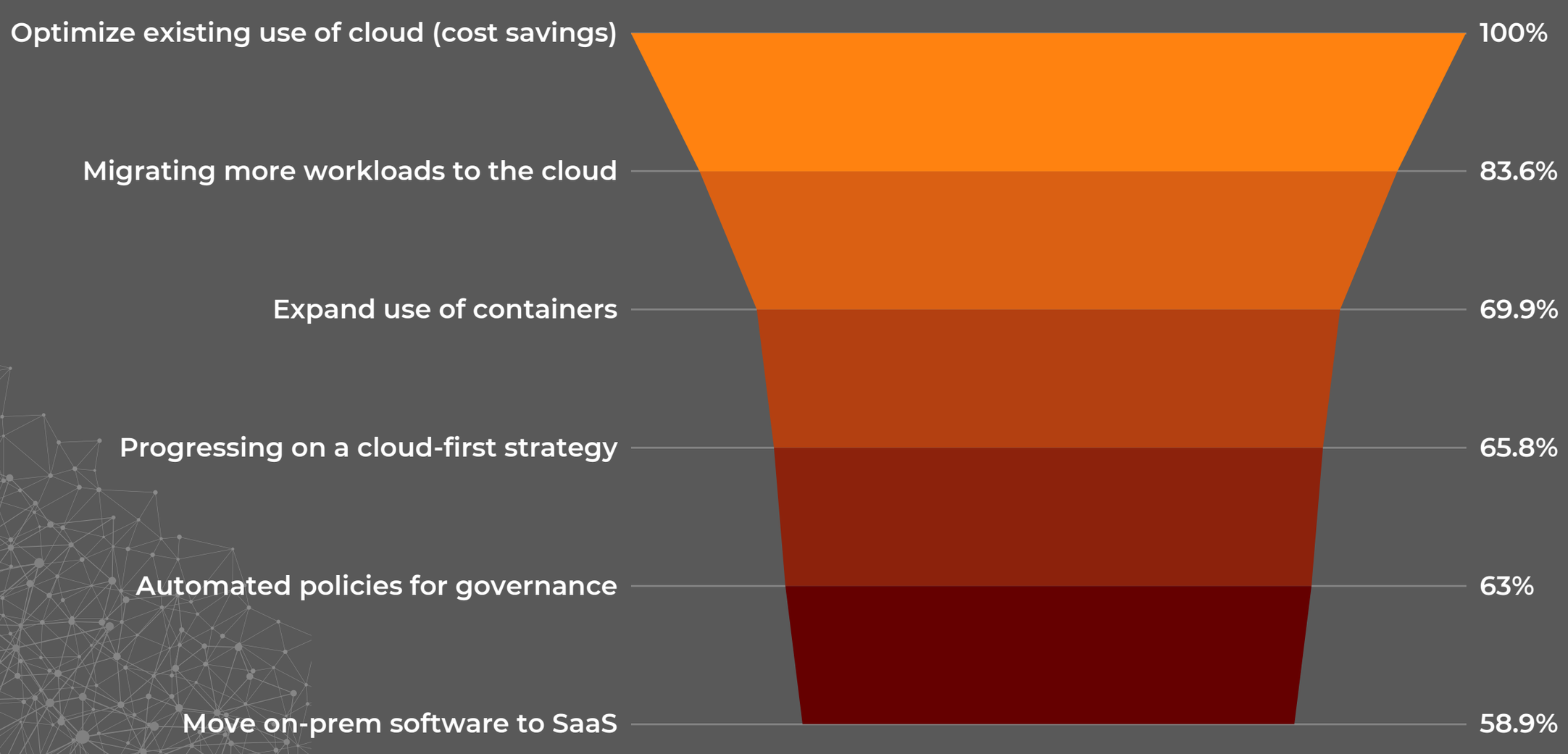
The Power of Why

The question to ask first is “why:” why are you thinking about embarking on an initiative, filled with uncertainty, to migrate your technology infrastructure, data, features, and functions (collectively workloads) to the cloud? The answer to that question will provide focus and clarity – it will tease the proverbial signal from the noise.

We need to think (wisely) about and (rapidly) create a cloud strategy and design as part of a larger mission to digitally transform. I’ve pointed out how my Legos metaphor was created to highlight complexity amid myriad choices. Professionals are moving to the cloud, so the numbers suggest, at incredible speed. Just look at the compounded annual growth rate (CAGR) for the cloud computing market, as we published on our knowledge Exchange (CLOUD COMPUTING GROWTH, Evidence of a Data-driven Paradigm Shift). As I assessed the seemingly infinite ways to assemble our Legos, and read the arguments, both pro and con, for each approach, two thoughts occurred to me.

Top Cloud Initiatives

According to Flexera's 2020 'State of the Cloud Report', cloud initiatives have also become highly prioritized to sustain success in rapidly changing digital environments. 73% of organizations said their top cloud initiative was to **optimize existing use of cloud/cost savings**. The next top initiative was **migrating more workloads to the cloud** which also supports that cloud migration will continue to expand rapidly into the next few years.



THE FUTURE OF THE CLOUD: THE POWER OF WHY?

First, for all the roof-top shouting about the importance of working through the multi-dimensional matrix of choices to get to the right solution, I found it challenging to accept the stunningly similar compilation of pros and cons and how they applied to the options in front of business leaders and their strategists. Surely there would be some differences of opinion. Something felt off. Why?

Second, amid all the hype about the enormous trillion dollar value potential stored in the cloud market (source: McKinsey [2]), just waiting to be realized, I took note of the commentary and statistics discussed in a very interesting piece by BMC, The Cloud in 2022: Growth, Trends, Market Share & Outlook, posted in October, 2021. Following a long list of very positive trends and supporting stats, the authors cautioned,

All these stats and trends verify and validate the exponential growth of the cloud computing industry. Cloud vendors, service providers and startup firms are gaining exponentially rising interest and popularity among investors, businesses and consumers.

But (and this is a big but),

[T]he growth figures should be viewed with the following caveat: cloud computing resources are drastically oversubscribed, underutilized and therefore, wasted.

According to BMC, 30% of all businesses waste cloud resources. They overspend by an average of 23%. No wonder 61% of business leaders listed as a top priority for the fifth year in a row figuring out how to improve their cloud spend ROI. Why?

45%

of businesses worldwide are running at least one of their big data work loads in the cloud.
Source: ZD Net

[2] McKinsey's February 26, 2021 article "Clouds trillion-dollar prize is up for grabs" is filled with valuable insights and outstanding examples of public cloud solutions that proved to be prescient and genuinely transformational. It is also worth noting that many of the examples cited would have never landed on a public cloud strategy and design had they listened too closely to the stunningly similar lists shouted from the roof-tops.

THE FUTURE OF THE CLOUD: THE POWER OF WHY?

Thought leaders are quick to highlight the challenges will smooth out as businesses become more native cloud capable; I agree. But is that it? Is it wise to rely solely on the hopeful assumption that as businesses become more familiar with cloud computing they will better allocate their cloud spend and achieve solutions with ROI worthy of the adjective “optimal?” Given such optimization remains a priority after a five-year run, perhaps a fresh perspective is justified.

Remember, the digital ecosystem is not simply changing; the rate of change is accelerating exponentially. Companies that wish to survive cannot adopt such a passive approach.

While it may sound counterintuitive, we are no longer in a measure twice, cut once world. By the time you take the second measurement, whatever you may be measuring will have ceased to be relevant. Act, fail fast, and learn from that failure while simultaneously riding the wave of change. The next attempt will include wisdom from the first failure along with insights gained while continuing to keep pace with change.

Incentives Matter -- Experts are Optimized

Leverage experts with incentive to achieve an optimal strategy

I submit the answer to the question, “which cloud-computing deployment model works best” for any given organization gives rise to the same basic answer, and other issues float to the top of the priority list of objectives.

How is that possible, you might ask? Given the array of options and the myriad combinations awaiting assembly into any number of solutions (Legos at work) how did the vast array of choices suddenly disappear? They didn’t disappear. They are simply residual noise created by the rapid cycle of change. Change is continuous and the acceleration of the rate of technological change is exponential. In such an environment, it is the public cloud-computing service providers (CSPs) that are most able to move quickly and at sufficient scale to keep pace with such change.

It is worth noting that as of the end of Q3 2021 (source: Statista) Google, Microsoft, and AWS together controlled 61% of the public cloud market share. Given the projected market segment growth, these very well capitalized and innovative companies and their business partners are highly motivated to mitigate all the “cons,” whether real or imaginary, in the vast array of blog posts, articles, and white papers offered by my friends still standing and shouting from the rooftop.

LEGOS BE DAMNED

Perhaps most compelling is the omnipresent discussion around security and control. While I question the validity of the concern on its face, and the examples McKinsey cited in the piece mentioned above seem to support my position, incentives drive behavior. Incentives derived from the profit motive drive innovation and invention. Recent advancements in secure computing technologies, such as confidential computing, demonstrate perfectly why all the energy expended assembling, falling short, and reassembling our Legos can and should be reallocated.

The world is a fast paced, continuously changing digital ecosystem. As I wrote in my last post, "today, the future is twice as close as it was yesterday and half as close as it will be tomorrow."

"today, the future is twice as close as it was yesterday and half as close as it will be tomorrow."

We just freed up a great deal of intellectual horsepower to redeploy. I suggest refocusing all this spare IQ capacity on your organization's talent, culture, business model(s), and leadership to overcome the challenges associated with what it means to undergo real digital transformation. Having stiff-armed cultural lag and developed a cloud native infrastructure upon which the organization sits, you will have made progress on the path to digital transformation. And that is the prerequisite to establishing a hyper-adaptive organization imbued with a newly evolved survival mechanism – strategic plasticity.

KEY TAKEAWAYS

1. **The concept of the Cloud is complex, and often misunderstood.**

2. **Cloud Computing functions something like Legos when we think big-picture; but, the nitty gritty details turn out to be a bit more complicated.**

3. **What we knew about the cloud yesterday may not hold true today. Change is accelerated and the need to adapt is inevitable.**

4. **Your Cloud Computing needs may be vastly different than your neighbor's. Luckily, you can plan for what you need in any given moment.**

5. **Cloud Computing Service Models are expanding and changing by the day; you'll find more capability at your fingertips, within the "Public Cloud" model than ever before.**

6. **The rate of change in our current digital climate is so incredibly fast that options change within just days or weeks. That means that finding a Cloud Computing Strategy that works for your business & needs may require constant adjustments, determined by successes, mistakes, challenges, and wins - assessed regularly.**

7. **Let "why?" guide your way: staying close to your "why?" will enable you to make the necessary changes required to keep pace with our rapidly changing digital ecosystem.**

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