

The Dynamic Future of Business

The Rise of **Dynamic Marketplaces** and
the Access Management Imperative

Horizon 2025

We live in an incredibly dynamic age with an unprecedented rate of innovation - and technology continues to play a central role.

But technology alone does not drive commerce forward. Rather, the developments across the three primary domains of business - the [workforce](#), the [workplace](#), and [technology](#) - and how the individual elements within these domains interact - will define the next chapter of business.

As forward-looking organizational leaders turn their gaze to the horizon with a particular focus on the upcoming decade, questions arise as to how business will evolve.

If widespread adoption of personal computers changed the rules of the game in the 1990s, the proliferation of the world wide web in the 2000s, and ubiquitous connectivity offered by mobile devices and cloud technologies in the 2010s, [what dynamic innovations will fundamentally alter business in the coming decade?](#)

While the crystal ball for even the most visionary executives ranges from murky to opaque, there is no questioning the fact that we are hurtling towards a new commercial frontier - and organizational leaders have a chance to unlock the associated opportunities for their business or risk showing up unequipped for success in the next commercial era.

To gain a clearer perspective on just what the state of business circa 2025 will look like, 100 Chief Information Officers from across the globe shared their perspective. Additional insight was provided by a number of IT and security professionals, technologists, and analysts of both the technology industry and business at large.

The future will undoubtedly include the continued maturation of technologies we have only begun to utilize, such as artificial intelligence and machine-learning, while revealing yet another generation of emergent technologies that are not yet on the map.

The question is not whether commerce will undergo a dramatic transformation in the coming years, but what - precisely - that transformation will look like, what new opportunities it will present, and, perhaps most importantly, what [yet-to-be-foreseen challenges](#) and bottlenecks will emerge.

Content

Horizon 2025

Evolutions Across Three Business Domains: Workforce, Workplace and Technology

The Rise of the Dynamic Marketplace

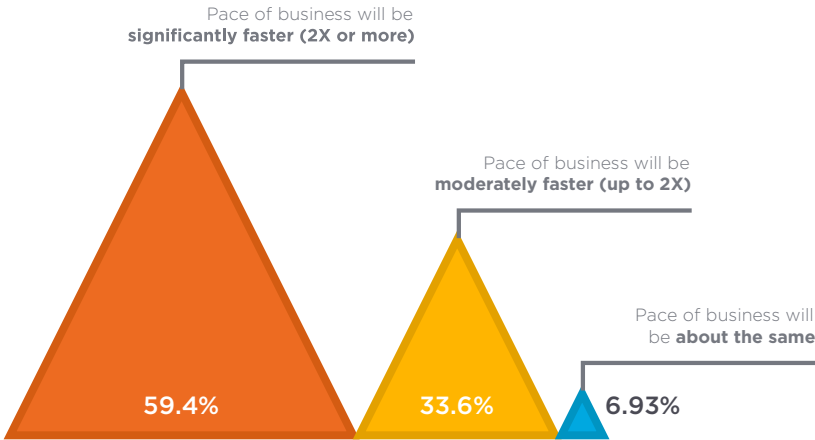
The New Digital Bottleneck & the Access Imperative

OneLogin Unified Access Management

Evolutions Across Three Business Domains

You do not have to be a futurist or a fortune teller to observe that the volume, complexity, and pace of all the critical elements of business are undeniably increasing over time.

In fact, **93%** of Chief Information Officers believe the pace of business will accelerate by 2025, while **59.4%** anticipate business evolving to at least twice the current pace.



To demystify the future of business, we examined evolutions in our commercial ecosystem across the three primary domains of business: the **workforce**, the **workplace**, and the **technology** that fuels it all.

DOMAIN 1 | Workforce 2025: Dynamic Humans & Entities

THE TALENT WAR

The criticality of attracting, retaining, and developing human capital has emerged as a primary business challenge, particularly in today's growth-oriented macro-economic climate.

In light of a growing amount of research linking employee's self-assessed satisfaction with increased productivity and corporate performance¹, organizations are rethinking their approach to talent attraction and retention, as well as the employee experience.

Attracting, retaining, and developing talent is exceptionally difficult in technical disciplines where the supply and demand talent equation is incredibly unbalanced. In fact, per a Stack Overflow study, there is **only one qualified software developer for every five open developer positions**².

¹ Schwartz, Tony. "Why You Hate Work". *New York Times*, May 30 2014.

² Ferrigno, Rachel. *5 Quick Stats About Developers (and What They Mean)*, Stack Overflow, October 2017.

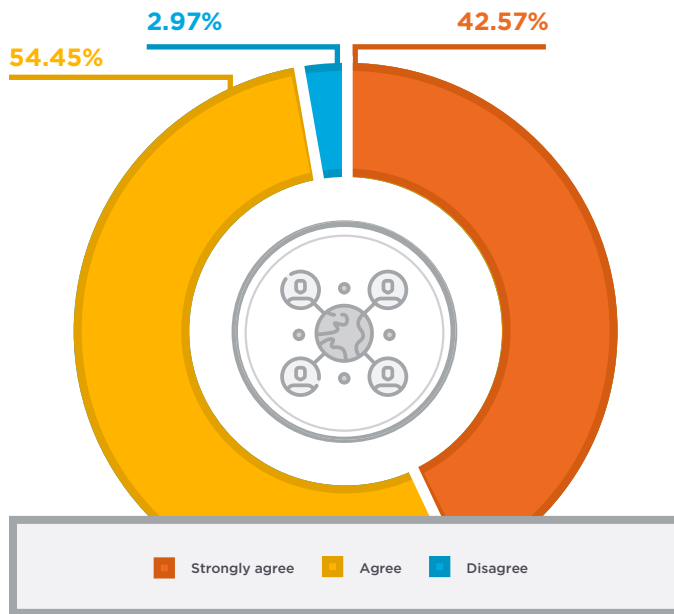
A SHIFTING WORKFORCE & RISING DIGITAL EXPECTATIONS

Today, over 77 million millennials are active members of the workforce. This sizable group represents just over half of the United States working population - and they are increasingly unwilling to technologically step back in time when they step into the workplace.

Colloquially referred to as “the generation that grew up shopping on Amazon.com”, these employees expect a mobile-first work environment, are fueling the freelance economy, and will change employers every 16 months on average.³

Adding to the complexity, today’s workforce is increasing dispersed, with a growing segment of the workforce (69%) prioritizing the opportunity to work remotely.⁴

THE WORKPLACE OF THE FUTURE IS WIDELY DISPERSED ACCROSS MANY GEOGRAPHIES AND TIMEZONES.



THE CYBERNETIC WORKFORCE: HUMANS & BOTS

Professionals are also challenged to realize the benefits offered by artificial intelligence (AI). We know that by 2020, artificial intelligence will produce more jobs than it displaces⁵ and that the field of AI will have created more than two million jobs by 2025.⁶

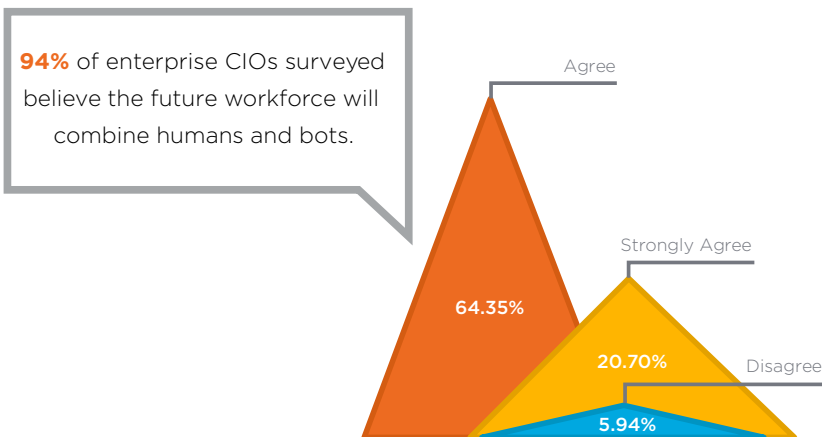
³ Schwartz, Jeff. Future of the Workforce Report, Deloitte.
⁴ Strauss, Karsten. Why People Feel More Productive Working Remotely. Forbes. September 2017.
⁵ AI & the Future of Work, WIRED Magazine, April 2018.
⁶ Robots Are Here to Give Us a Promotion, Not Take Away Jobs, CNBC, December 2017.

Elon Musk offered his perspective on artificial intelligence in the context of work, explaining:

You could argue that any group of people - like a company - is essentially a cybernetic collective of human people and machines. That's what a company is. And then there are different levels of complexity in the way these companies are formed and then there is a collective AI in Google search, where we are also plugged in like nodes in a network, like leaves in a tree. ... We're all feeding this network with questions and answers. We're all collectively programming the AI and Google. ... It feels like we are the biological boot-loader for AI effectively. We are building progressively greater intelligence. And the percentage that is not human is increasing and eventually we will represent a very small percentage of intelligence.⁷

The opportunity to work in fields directly related to the creation and management of AI technologies is only part of the equation. The broader question for business leaders is how to successfully harness the power of [artificial intelligence](#) in all its manifestations and applications, from machine learning to neural networks, from automated bots to diagnostic wizards - and then [aggregate their human and digital resources](#) in the most efficient and effective manner possible to solve problems and provide meaningful business impact.

This new and powerful blend of resources represents the [augmented workforce](#). An overwhelming **94%** of CIOs are convinced the workforce of the future is comprised of humans and bots, with nearly a third of CIOs indicating a particularly strong conviction that this will be the case.⁸

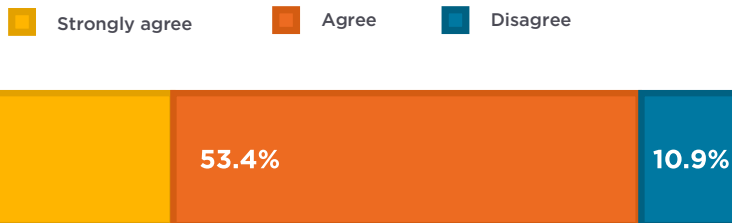


⁷ Elon Musk, Joe Rogan Experience Podcast, September 6, 2018

⁸ Pulse Q&A, The Future of Identity and Access Management, a CIO Survey, January 2019.

Perhaps more interestingly, [89%](#) of CIOs believe that high-performing businesses of the future will be required to leverage machine learning and AI to predict and rapidly meet the needs of their customers.⁹

BUSINESSES OF THE FUTURE WILL HAVE TO BE ABLE TO LEVERAGE MACHINE LEARNING AND AI TO MEET THE NEEDS OF THEIR CUSTOMERS.



DOMAIN 2 | Workplace: The Elastic Enterprise

As dynamic as the shifts in the workforce domain of commerce are, there are equally as fundamental transformations occurring in the “where” and “how” domains.

For a growing number of professionals, [work is no longer a physical destination](#). Rather, it is a fluid and boundaryless experience measured by output and impact, as Microsoft CEO Satya Nadella explained: “Work is no longer a place you go. Work is about making things happen where you are and having the experience you need to get things done available on every device, wherever.”¹⁰

THE ELASTIC ENTERPRISE, GUNS FOR HIRE, AND DIGITAL NOMADS

Work can - and does - occur anywhere at anytime. An increasing number of employees are working remotely - and prioritizing the flexibility to do so, with [43%](#) of employees reporting working remotely at least part time¹¹ and [69%](#) of professionals citing workplace flexibility as a critical issue when evaluating potential employers.¹²

These shifts are top of mind for Chief Information Officers, with a near-unanimous [97%](#) global CIOs agreeing that [the workplace of the future is widely dispersed](#) across many geographies and timezones.

There is also a growing volume of [external parties](#), including partners, contractors, and customers, that may require access to services within an organization. For example, manufacturers undergoing digital transformation are increasingly transitioning the nature of their collaboration with supply chain partners away from manual, analog processes in favor of real-time collaboration via Software-as-a-Service (SaaS) apps.

⁹ Pulse Q&A, *The Future of Identity and Access Management, a CIO Survey, January 2019.*

¹⁰ Nadella, Satya, *Microsoft Future Decoded Event, London, England, November 2015.*

¹¹ Chokski, Niraj. *Out of the Office: More People Are Working Remotely, Survey Finds, New York Times, February 2017.*

¹² Strauss, Karsten. *Why People Feel More Productive Working Remotely. Forbes. September 2017.*

While the business impact of this collaboration is evident, facilitating this process, whereby external users are granted access to internal systems, challenges existing access management and security strategies.

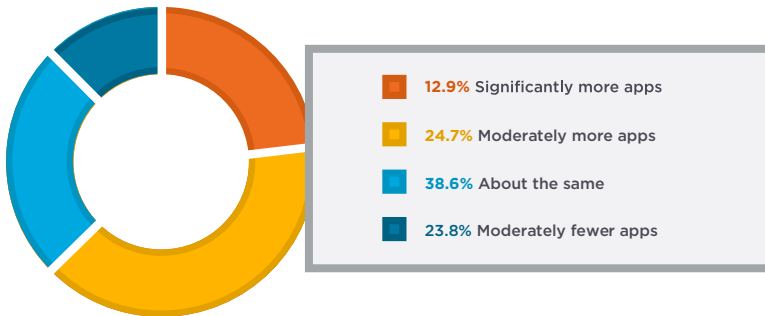
Much as the shifts in the workforce domain are characterized by increased fragmentation and complexity, the splintering of the workplace challenges business leaders in a number of ways, ranging from the logistical, to the cultural, to the digital.

DOMAIN 3 | Technology: The Digital Backbone

Evolutions in technology have impacted all aspects of commerce. In the last decade alone, we have witnessed the rise of trends that many of us now consider mainstays of how we work - trends including Bring Your Own Device (BYOD), employees spinning up SaaS apps on-demand, the blending of lines between personal and professional applications (such as Evernote), and using any number of online marketplaces for identifying on-demand talent resources.

APP EXPLOSION

The sheer volume of software services has exploded, with the average enterprise using **2,500 unique applications**, up from 750 apps just two years ago. Meanwhile, over 87% of CIOs anticipate the number of applications in use in their organization to either increase (62.4%) or stay consistent (24.7%).¹³



Where commercial software offerings prove insufficient, organizations are increasingly turning to in-house resources to develop custom apps, with enterprises using over **450 custom applications** on average.¹⁴

The addition of SaaS applications to an existing on-premises application portfolio leaves many organizations in a hybrid state where their software catalog is increasingly split between apps hosted on-premises in data centers they manage and apps hosted in public cloud environments.

Hybrid Access Management

A growing number of organizations are forced to manage a complex application environment consisting of Software-as-a-Service (SaaS) applications as well as commercial and custom web apps hosted on-premises, at remote data centers, and in private clouds. Organizations are further challenged to manage access to applications, networks, and devices for users stored in disparate directories.

Conventional access management solutions force technology professionals to assemble multiple vendor offerings to address their needs. While legacy Access Management solutions offer robust functionality for on-premises apps, they fail to address the growing volume of cloud apps and create additional pain points in the form of their cost, maintenance, complexity, and overhead.

Meanwhile, conventional Identity-as-a-Service (IDaaS) solutions offer operational ease, reduced total cost of ownership, and support for standards such as SAML, OAuth, and SCIM, but cannot manage access for on-premises applications. These challenges pave the way for a centralized, unified approach.

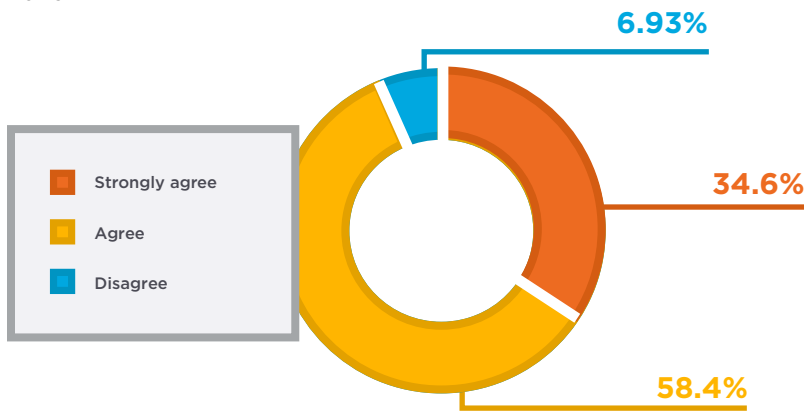
¹³ Pulse Q&A, *The Future of Identity and Access Management, a CIO Survey, January 2019.*

¹⁴ Pulse Q&A, *The Future of Identity and Access Management, a CIO Survey, January 2019.*

In fact, by 2022, the proportion of an enterprise's apps that are hosted on-premises will drop to 54% as the amount of apps hosted in the cloud increases to 46%.¹⁵

AUTOMATION

As digital transformation trends continue across a wide range of industries, a growing amount of processes are automated. A near-unanimous 93% of CIOs anticipate a significant increase in the automation of work processes by 2025.



THE CRITICALITY OF RELIABILITY & UPTIME

As a growing volume of enterprise application services are hosted externally, the criticality of uptime and reliability rises in parallel. The global, delicate interdependency between all of the connected users (human and machine), applications (on-premises and cloud), and devices further complicates matters.

For service providers, the pressure of maintaining impeccable uptime is tangible, with the cost of downtime rising. For 81% of businesses, downtime costs over \$300,000 per hour, with 33% of those organizations reporting one hour of downtime costing between \$1 million and \$5 million dollars.¹⁶

The Rise of the Dynamic Marketplace

While research has analyzed - and attempted to best take advantage of - the developments across the three commercial domains of the workforce, the workplace, and technology, it is all too easy to over-index on a particular domain and fail to see the bigger picture.

In adopting a broader outlook that considers not only the changes in each domain, but the aggregate impact of these shifts on business as a whole, a fundamental shift in the very nature of commerce emerges.

¹⁵ Pulse Q&A, *The Future of Identity and Access Management, a CIO Survey, January 2019.*

¹⁶ Lerner, Andrew. "The Cost of Downtime". Gartner Research. July 2014.

Meet the Dynamic Marketplace

This new commercial ecosystem, predicated on the advancements across the workforce, the workplace, and technology, presents new business opportunities as well as new challenges. In this future state, we envision the rise of the [dynamic marketplace](#).

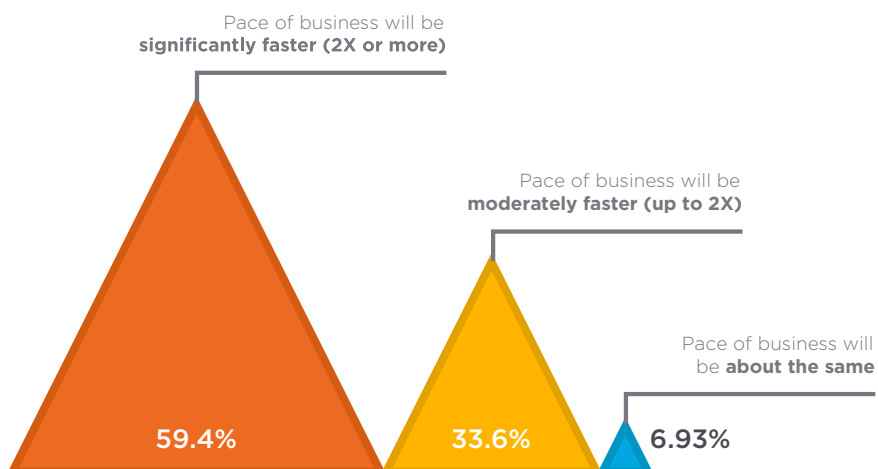
Over [92% of CIOs](#) envision that by 2025, a dynamic marketplace will arise where a human and digital workforce using an increasingly complex technology stack will conduct business in a blend of physical and virtual workplaces worldwide.

A dynamic marketplace is defined as [any intersection of the elements featured within each of the three primary commercial domains](#) of the workforce, the workplace, and the supporting technology. For example, a dynamic marketplace may form at the intersection of full-time employees at corporate headquarters accessing on-premises applications.

Alternately, it could be contractors working for the same organization remotely accessing corporate SaaS apps. Or, it could be a compilation of both of these intersections. Or, it could include customers that are accessing internal services from all over the world. The possibilities are infinite - and that is very much the point.

In this environment, [93%](#) of Chief Information Officers anticipate an acceleration of the overall pace of business, with nearly two-thirds expecting a significant acceleration in excess of double the current pace.

This pace extends to all elements of commerce, from the most fundamental aspects (onboarding new employees, mapping employees of different departments and seniority levels to digital services and resources) to the most urgent (introducing products to market in a timely fashion, responding with agility to an extraordinarily dynamic marketplace where your consumers, partners, analysts, and competitors are all also moving at twice the pace).



The Unique Opportunities of a Dynamic Marketplace

As in any development in business, the ultimate value of the dynamic marketplace resides in its ability to empower businesses to respond to market trends with greater agility and speed, outpace and outperform competitors, offer customers a superior product, experience, and price, as well as increase employee satisfaction, and empower employees with the requisite technology to be most productive.

Consider the pace at which a toy manufacturer may identify an appetite for a particular product based on a trend in the marketplace, onboard a remote industrial designer to complete a prototype and blueprint, rapidly spin up resources on the other side of the globe to meet demand at a massive scale, empower customers to access their services and customize the toy, distribute the product, recognize revenue, and offboard the associated temporary resources - all in the matter of days or weeks, not months or years.

AIRBUS: DYNAMIC MARKETPLACES IN FLIGHT

Airbus is an example of an organization that is undergoing large-scale evolution, as Chris Taylor, Head of the Airbus Digital Accelerator Program, explains: "Digital Transformation is a strategic driver for Airbus. We are completely redesigning our information technology systems to create added value for the business."¹⁷

The Airbus **workforce** is the very definition of dynamic: it is highly-distributed, comprised of not only a massive global employee base but also built on a series of relationships with over 12,000 discrete partner organizations that make up their supply chain network they tap into to build planes.

The **workplace** is elastic and boundaryless, defined by the individual behavior of those hundreds of thousands of individuals. And the **technology** that enables the connections between the mass of human and digital resources spans commercial and custom applications hosted on-premises in addition to a growing volume of cloud applications, accessed across any device imaginable, spanning corporate and personal computer workstations and mobile devices.

In solving for this complexity and mapping human and digital resources to one another efficiently and securely, Airbus is able to accelerate the pace of business operations, reduce operational expenses, offer employees - particularly those of a technical background - a superior experience, improve security, and - ultimately - create an appreciable impact on the business as a whole.

¹⁷ OneLogin, "Airbus Selects OneLogin", Press Release, August 2017.

While a dynamic marketplace presents no lack of opportunities, this new model also introduces a new set of limiting factors to be identified and mitigated. With the increasing volume of commercial elements leaders must connect in order to construct a dynamic marketplace, increasing complexity presents itself in the attempts to [integrate these nodes in a manner that is efficient and secure](#).

The Evolving Role of the CIO

In this brave new world, the role of the Chief Information Officer is expected to shift. Specifically, the role of the CIO is moving away from defining the technological resources that teams use to accomplish work. As a March 2016 article in Fortune magazine entitled “Why No One Wants to be a Chief Information Officer Any More” explains:

CIOs also end up being the wet blankets of the technology field. They have to tell the Chief Marketing Officer that he can't buy his own server and cool software for automated ad creation. For years they had to tell executives that they must use BlackBerrys rather than iPhones. It's their job to ensure that company employees will have less powerful and desirable technologies than their employees' teenage children. CIOs are naturally killjoys; it's just their role to ensure compliance with corporate technology standards and that is seldom fun.¹⁸

“The new breed of CIOs are a lot more business focused. The days are gone where they just focus on technology. But they have a good view of the business as a whole so they can use software and data analytics to really drive the business strategy. CIOs must become disrupters. To do that, a combination of technology background and a strong business background is key. They have to become more of a business strategist person than just a pure technologist.”¹⁹

– Sanjeev Addala, chief digital officer, GE Renewables

With increasing frequency, technology selection is owned by individual line-of-business heads. For example, the Chief Marketing Officer defines the MarTech stack, the Chief Financial Officer defines the FinTech stack, and so on. These professionals are in a better position to select best-of-breed technologies that best fit the needs of their teams and the broader business.

Rather than selecting individual point solutions, [the Chief Information Officer role is evolving such that they play the part of a curator and an architect](#), providing guidance around technology selection and partnering with individual line of business heads to enable all of these technologies to function at a macro level.

¹⁸ Davenport, Thomas H. “Why No One Wants to Be a Chief Information Officer Any More”. *Fortune Magazine*. March 2016.

¹⁹ “Should CIOs have a technology background?” *The Enterprisers Project*. December 2016.

As CIOs shift to a role more centered around providing a scalable and secure digital backbone, they are expected to provide more strategic - and often quantifiable - business value. An overwhelming 97% of CIOs are of the opinion that the most successful professionals in their role will have made the transition from delivering technology to driving business value across their organizations. In fact, a growing number of CIOs have a background that is rich in business acumen and experience rather than simply technology.

IN 2025, THE MOST SUCCESSFUL CIOs WILL TRANSITION FROM DELIVERING TECHNOLOGY TO DRIVING BUSINESS VALUE.



The New Digital Bottleneck and the Dynamic Access Imperative

As the volume and complexity of the elements across the three commercial domains of the workforce, the workplace, and technology increase dramatically, the effect is a mass splintering and fragmentation of users, applications, devices, and locations where the work is done.

Historically, the [pendulum swing between centralized and decentralized computing](#) has been defined by the needs of the business and the limitations of the supporting technology.

In an earlier era, “dumb” terminals relied on supporting infrastructure for everything from data recall to processing. With advances in personal computing spanning processing power, memory, and storage capacity, a centralized age was ushered in where individual workstations gained autonomy. Then, with the advent of the internet, web-based applications, and the SaaS explosion, our individual machines were all but rendered relatively useless without internet connectivity.

We may be at a breaking point, reaching the limit of this current pendulum swing towards decentralized. Some of this is due to the sheer volume and complexity of the landscape, as Gartner Research predicts that by 2020, a typical small enterprise’s access management program is going to span one million human users, ten million devices, and [billions of relationships](#).²⁰

“You can be a CIO with a technical background, but you can’t be a CIO without a business background. If you’ve got a business background and you’re technical, that’s great. If you’ve got just the technical background, I don’t know if you can really thrive. At the board level, you are talking about solving business problems and taking advantage of business opportunities. You can only do that if you understand the business.”

– Bill Packer, CIO of American Financial Resources, Inc.

²⁰ Allan, Ant, Gartner Identity and Access Management Summit 2016, Gartner Research, March 2016.

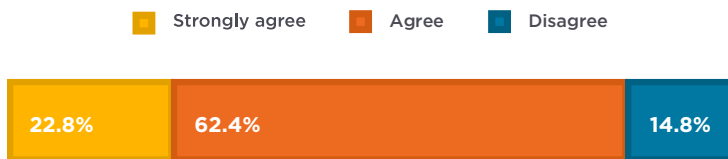
Bottlenecks: There's One in Every Crowd

For every shift in commerce, it seems a new bottleneck emerges. As the landscape evolves over the coming decade, it becomes clear our dynamic future has a static problem, or bottleneck. In order for the dynamic marketplaces of the future to thrive, the relationships between all of the critical elements must be managed. The emerging bottleneck is our ability to facilitate the interconnectivity of all of these nodes with a high level of efficiency and security.

In short, while dynamic marketplaces present an opportunity to capitalize on the pace and scale of business, they also introduce a new bottleneck: our ability to facilitate the relationships between all of the fragmented elements.

Many of the existing approaches to connecting these nodes are a class of technologies under the broad umbrella of Identity and Access Management. With the increasing fragmentation, many enterprises are forced to stitch together multiple point solutions, to solve their access management needs.

In fact, over 85% of CIOs agree that managing access for the billions of relationships between people, bots, data, applications, and infrastructure may be the primary bottleneck for business productivity in 2025.



This bottleneck also represents an opportunity for innovative technology leaders to adopt a strategic approach where technology and security investments are aligned with business objectives and act as business enablers rather than blockers.

The Dynamic Access Opportunity

Access management is critical to allow dynamic marketplaces - with all their fluidity, speed, and complexity - to flourish.

Businesses must be capable of mapping all aspects of the workforce, including not only full-time employees, but increasingly partners, contractors, customers, and even machine identities, to all the corresponding digital resources, including devices and applications - both SaaS and on-prem, regardless of the location, including corporate headquarters, satellite offices, and remote locations. This access must be unified, resilient, secure, and simple.

“Transformation is all about change. Change is the most powerful word in any language. Without change, we don’t develop, prosper, or grow. In business, you either change or die. The digital transformation is about increasing the velocity of your company. Speed is the new currency of business. It is not the big that will eat the small. But the fast that will eat the slow.”²¹

- Keith Krach, Former Chairman & CEO, DocuSign

²¹ Krach, Keith, CeBit Event, Hannover, Germany, 2017.

UNIFIED

In the highly-distributed, decentralized state most businesses operate within, it is increasingly critical for both efficiency and security that access management operations are centralized across one platform.

This platform must be able to map all human and digital resources, including [all user types](#) (full-time employees, external contractors, partners, and customers) stored across multiple directories, [all devices](#) (corporate or personal, workstation or mobile), [all applications](#) (commercial or custom, hosted on-premises or in the cloud), across [all locations](#) (corporate headquarters, satellite offices, and remote locations). Agnostic of any permutation of the above criteria, access management must simply work.

SECURE

Identity assurance and data integrity are crucial to adhering to internal security policies, external compliance regulations, and preventing headline-producing and career-altering security breaches. From the earliest days of access management, defining and enforcing policies around “who has access to what - and under what circumstances” has been fundamental to IT programs.

RESILIENT

As the pace, scope, and complexity of business increases, the importance of continuous availability and ubiquitous connectivity grows in parallel. As access management solutions are a tollgate technologies that grant or deny access to applications, dial tone level uptime is critical.

SIMPLE

As access management technology touches every user within an organization, the user experience must remain intuitive for everyone, from the end-user to the administrator. Dynamic access must scale with fluidity as the enterprise grows and flexes, acquiring new organizations, onboarding new users, and spinning up new applications.

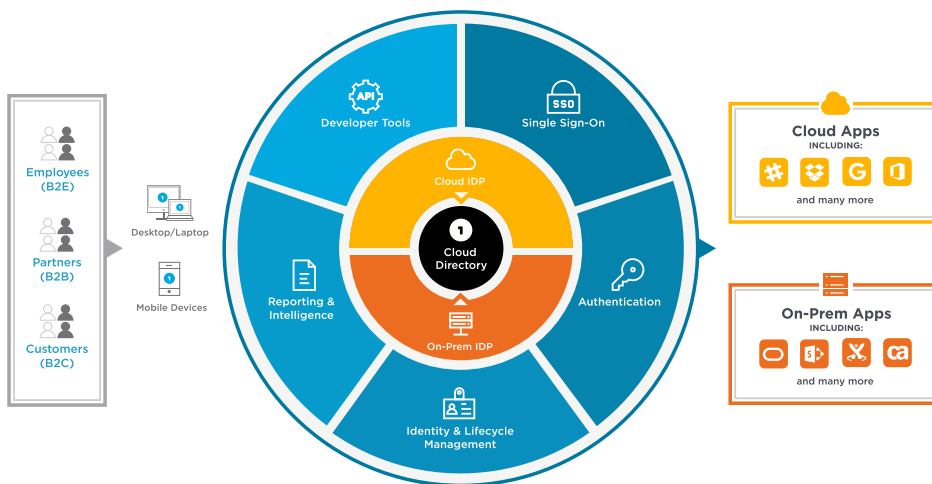
In essence, Dynamic Access is a control plane that abstracts the complexity of what sits below it.

OneLogin Unified Access Management

Conventional Identity and Access Management tools force organizations to manage access to distinct environments, networks, and devices separately, leading to a fragmented approach that is plagued with [complexity](#), [inefficiency](#), and [high cost](#).

In response to the existing demands of your business - and in preparation for our dynamic future, the OneLogin [Unified Access Management](#) platform empowers technology professionals to take a centralized approach to access management:

The cloud-based OneLogin Unified Access Management Platform unifies access to both SaaS and on-premises applications, as well as a range of networks and devices, to make it simpler and safer for everyone to access the apps and data they need, anytime and everywhere.



Additional Resources, Request a Demo, & More

To view additional educational resources, request a demonstration, or start a conversation, be sure to visit www.onelogin.com/dynamic-future-business.

About OneLogin

OneLogin, the leader in Unified Access Management, connects people with technology through a simple and secure login, empowering organizations to access the world™. The OneLogin Unified Access Management (UAM) platform is the key to unlocking the apps, devices, and data that drive productivity and facilitate collaboration. OneLogin serves businesses and partners across a multitude of industries, with over 2,500 customers worldwide. We are headquartered in San Francisco, California. OneLogin is a FedRAMP Ready cloud service provider. For more information, visit www.onelogin.com, [Blog](#), [Facebook](#), [Twitter](#), or [LinkedIn](#).

About Pulse

Pulse is a decision engine for data-driven executives. With a community of thousands of verified CIOs, CTOs, CISOs, and more, the platform enables rapid access to insights to drive your business decisions.