



The Enterprise Guide to Application Modernization for IT and Development Leaders



EXECUTIVE SUMMARY

Today's businesses are faced with a singular reality: innovation is a requirement for mere survival. Yet many enterprises are crippled by legacy and technical debt.

This paper is written for the leaders tasked with bridging the gap.

Skytap Cloud's approach to modernizing Infrastructure, Process, and Architecture (IPA) equips senior IT decision-makers with a realistic, achievable path to application modernization. In this paper, you'll learn how to tackle seemingly insurmountable challenges one step at a time and see real-world examples from enterprises that have already succeeded.

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1. INNOVATION IS EVOLUTION

Competing in today's world means continually delivering the best products to the right people at the right time. Often, this must be done as quickly as possible, which accelerates the introduction of technology. In decades past, we would imagine new technologies and wonder about their future arrival. Now, with disruptive technologies launching daily, the future is created in real-time.

Enterprises must be able to meet this new pace of delivery to survive. We know the technologies that will get us to a modern competitive state—like cloud computing, containers, and AI—already exist and, in

some cases, are mature. What's often less clear is how to bridge the gap between where an enterprise is and where it wants to be. This is especially true for large, long-established enterprises that rely on traditional, legacy technologies.

The trick to modernizing older systems can be found by looking back in time. When new generations of computing are introduced, they are often heralded as a revolution that will change everything, but the reality is that each new technology—from mainframes to AI—was built on the best from the previous generation. Innovation is evolution, not overnight change. Modernizing traditional applications happens the same way, through evolution.

2. WHY MODERNIZE? MAKING THE BUSINESS CASE

The unrelenting pace of innovation demands that business modernize, however many organizations will need to establish a formal business to embark on an initiative. While each business has unique considerations, several common objectives must be considered:

- ***Innovate and Compete:*** Modernization facilitates accelerated introduction of new business capabilities. This agility makes an organization more adaptable to future market and technology disruptions, and better able to handle unforeseen changes in technology, customers, and the competition. The ability to respond to and excel amidst change is key to long-term viability.
- ***Adopt Cloud Computing:*** Application modernization can be used as the impetus for transitioning to a modern, cloud-based infrastructure model that enables capacity on-demand, self-service provisioning, global reach, reduced costs via multi-tenancy, and metered pricing.
- ***Improve Development Agility and Reduce IT Backlog for Resources:*** Streamlining resource provisioning and implementing agile development processes frees organizations to focus on delivering new business value and reducing technical debt, instead of just keeping the lights on.
- ***Time to Value:*** Enterprise IT must operate as a business partner capa-

ble of delivering functionality in line with business and customer demands. Systems and methods of work must be modernized to deliver higher quality software at a faster rate.

- ***Maximize ROI:*** For many enterprises, traditional applications represent decades of investment. Modernizing these applications preserves their value and the business investment in them, while also eliminating the greater expense and risk of large refactoring initiatives or wholesale rewrites.
- ***Mitigate Risk:*** Enterprises that forego modernization risk falling short of critical compliance and security standards, jeopardizing their customers as well as their business. Organizations may use modernization initiatives as an opportunity to invest in technology and process improvements necessary for ongoing security requirements.

The preceding list concentrates on active justifications for application modernization. Forward thinking organizations also recognize that maintaining the status quo comes with its own risks. Businesses need look no further than industries like retail, transportation, and media for proof that market dominance is increasingly determined by the ability to deliver value rapidly and cost-effectively.

Organizations that put off modernization mire themselves in technical debt and hinder their own ability to execute, putting them at significant disadvantage to more aggressive competitors. Put succinctly, doing nothing could put you out of business.

3. THE ENTERPRISE PROBLEM: AGILITY IS CONSTRAINED BY TRADITIONAL APPLICATIONS

Traditional applications limit an enterprise's ability to move quickly in two ways. First, the monolithic architecture of a traditional application is inherently inflexible, creating exponential inefficiencies when building and running applications. Second, traditional applications constrain development for new, cloud-native applications that depend on them.

Application components in a monolithic architecture are tightly coupled; changes to any individual component requires changes to other components. This architecture translates to an inefficient code base that passes waste onto teams, including:

- Upgrades, patches, and bug resolutions require more work, increasing technical debt.
- Configuring environments for development and test is more complicated, slowing release cycles.
- Infrastructure is wasted when applications scale, as unused components must scale along with components in use.

Cloud-native applications solve for some of these limitations by using microservices architectures to leverage key tenets of cloud infrastructure, like scalability, elasticity, and reliability. While some may

still require tight coupling with the cloud provider, microservices architectures endow these applications with flexibility and agility.

As enterprises introduce cloud-native applications and infrastructure, IT teams and work become bifurcated. New systems are developed using agile with the goal of driving business innovation, while existing systems are simply maintained using waterfall methodologies.

Yet systems of record and traditional applications are often the core of enterprise business, and new systems drive innovation by building on this foundation, not replacing it. The dependency of new applications on core, traditional applications is felt acutely in a business's software development lifecycle (SDLC).

Teams focused on newer applications who are moving quickly break away from their counterparts servicing traditional applications. But the SDLC is still dependent on the slower systems, thereby slowing development and risking overall application integrity.

This bottleneck can become so problematic that organizations must identify a strategy to bring the pace of development and the architectural flexibility of traditional applications up to speed. Often, they turn to the cloud to solve this problem.

4. THE RELATIONSHIP BETWEEN APPLICATION MODERNIZATION AND CLOUD TECHNOLOGIES

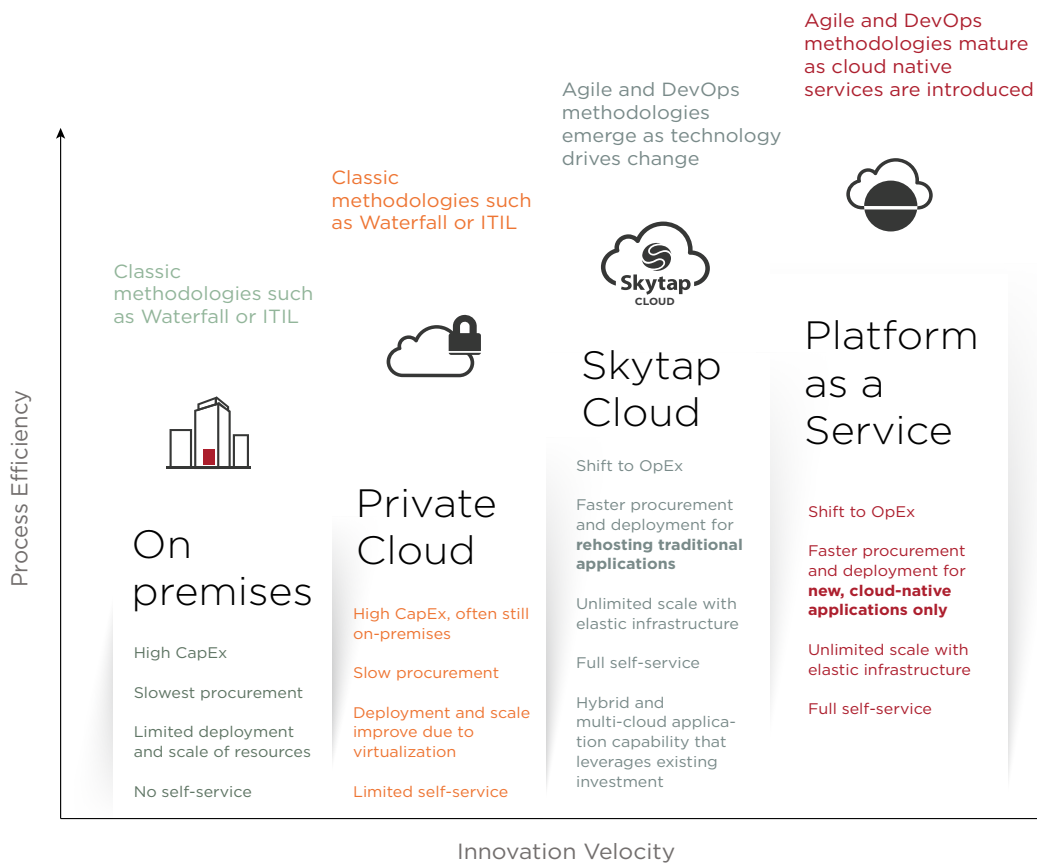
The goal of traditional application modernization is to **optimize** both the velocity and the efficiency of an application's release cycle. By introducing new technologies and embracing new processes, businesses can deliver value more quickly.

The diagram below illustrates how technology facilitates application modernization. **Innovation Velocity** is the speed at which a team can introduce something new and of value to its customer at a reasonable cost and is often tied to tech-

nology strategies and choices. **Process Efficiency** is the ability for a team to improve how it brings innovation to market with the least amount of friction and is often related to process methodologies such as ITIL, Waterfall, DevOps, or Agile.

Consider where you are on the application modernization spectrum in relation to the goals that you need to achieve. A business does not need to reach the upper right corner for every workload. Instead, it will be best served by determining the appropriate level for each application as defined by the needs of the business.

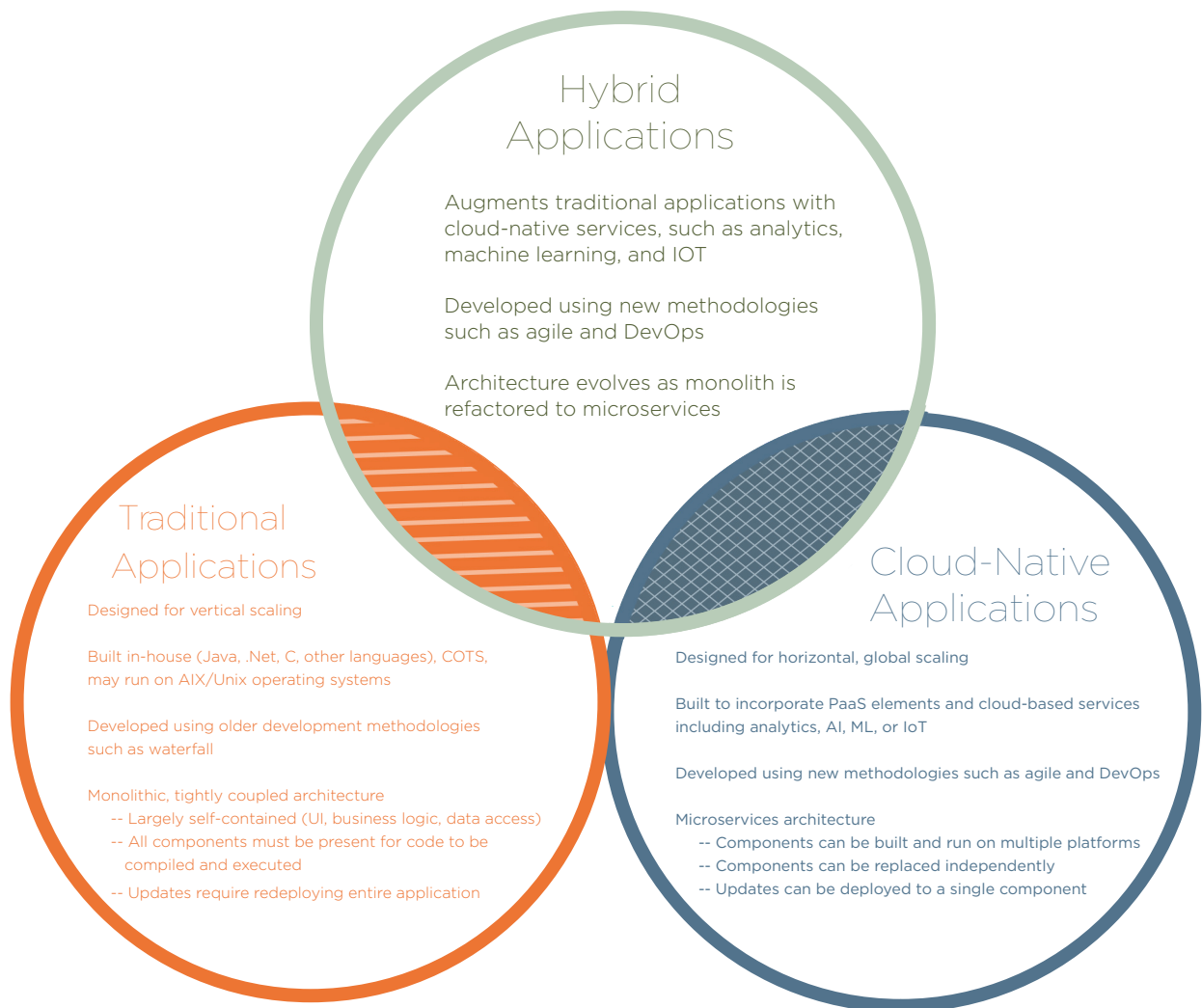
Application Modernization Spectrum



Traditional, Hybrid, and Cloud-Native Applications Intersect

The reality of enterprise IT is that investments made in traditional enterprise applications can't be abandoned, but must be leveraged alongside new development. Hybrid applications bridge the gap

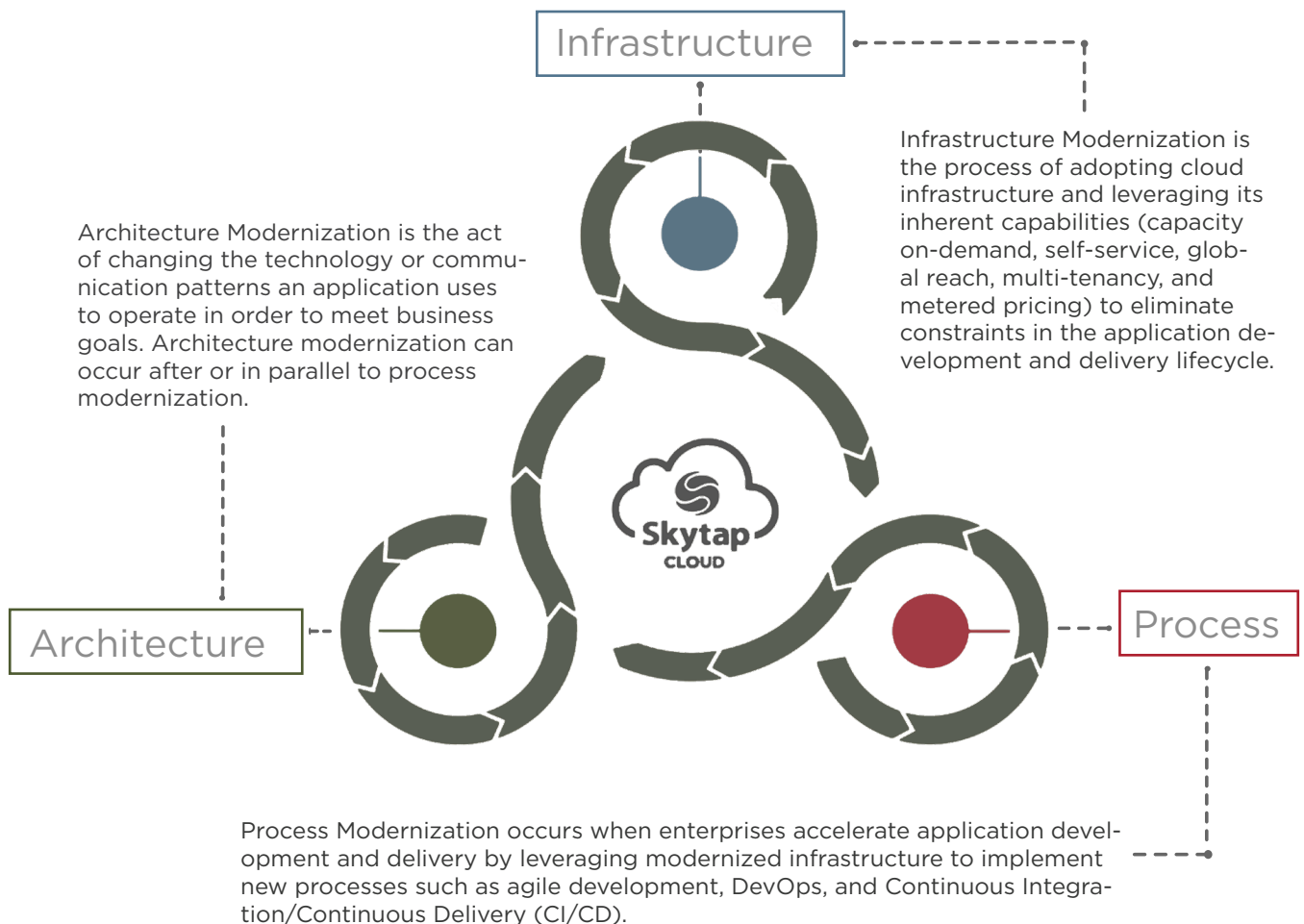
by preserving the valuable foundation of traditional applications while evolving them with new cloud native services. This incremental approach is the most direct path to application modernization.



5. INFRASTRUCTURE, PROCESS, ARCHITECTURE: APPLICATION MODERNIZATION WITH SKYTAP CLOUD

Embarking on application modernization initiative can seem overwhelming; you must rapidly modernize legacy systems without jeopardizing the business foundation. The key to success is

to modernize iteratively, by breaking your journey into realistic, attainable segments. We've seen enterprises achieve success by using a progressive approach of Infrastructure Modernization, Process Modernization, and Architecture Modernization (IPA).



Not every application or business case will require completing the entire IPA cycle to achieve modernization success. En-

terprises should determine what level of advancement is necessary for each application based on its unique requirements.

Best Practices for Your Application Modernization Initiative

1.) Establish Your Champion: You need a champion who understands the business goals and has the influence to help make them happen. Your champion must have the clout to remove barriers (e.g., security), enlist help (e.g., networking, operations), and get budgets approved (e.g., procurement).

2.) Start with Low Hanging Fruit: Shoot for a quick victory by finding a system that meets these criteria:

- A) Something “interesting” that people care about
- B) A system that clearly needs improvement
- C) The smallest, most self-contained system that meets criteria A and B.

3.) Define Success Metrics: Establish the reason to migrate, and a way to measure success. Focus on goals that will benefit your business in the long-term, like improving release velocity, gaining new insights, or improving quality versus short term goals like saving money. Good goals: improve feature velocity, gain new insights from data, or improve quality. Measure positives and negatives like builds, test coverage, feature releases, human down-time waiting for resources, scalability, production issues, etc.

4.) Migrate, then Modernize: Take the smallest steps possible towards your goal. First, migrate the existing system with as little change to technology and processes as possible. After successful migration, improve your processes. Once that is done, work on the technology. Said another way, containers and microservices come last not first.

5.) Measure and Adjust: Use your pre-defined success metrics to measure your progress. Use the results to adjust process where it makes sense.

6.) Repeat: When finished, begin again at Step 2 with a slightly more complicated, less self-contained system (or Step 1 if your champion is worn out).

Infrastructure Modernization

Skytap Cloud makes it possible to take traditional applications running in on-premises datacenters and move them into the public cloud without refactoring or rearchitecting.

Once in Skytap Cloud, enterprises can leverage an environments-based infrastructure model to:

- Provide self-service access to teams
- Reduce environment provisioning times
- Eliminate configuration drift
- Enable global reach
- Increase infrastructure utilization
- Lower total cost of ownership (TCO)

Fortune 50 Company Transforms Application Delivery, Drives 20% Efficiency Gain with Skytap Cloud

One of the largest and longest standing technology companies in the world operates a healthcare business unit providing transformational medical technologies and services that are shaping a new age in patient care.

Challenges

As part of a companywide initiative to move to the cloud, the business needed to consolidate a datacenter that housed a suite of revenue-generating traditional applications. Most public clouds require timely and costly application rewrites. Given the mission-critical nature of these workloads, both to customers and the business, a refactoring or rewriting initiative was not worth the risk.

The business also needed to consider on-premises development challenges. Originally architected to run on-premises, the applications are comprised of both x86 VMs and AIX-based VMs and are tightly coupled, but development is done individually.

The complex integrations resulted in lengthy provisioning times of up to two weeks. Additionally, after provisioning, the environments still required an additional five hours to configure software. With over 500 engineers, wasted time engaging in redundant labor and configuration drift added up quickly. All of this made testing difficult, and quality slipped.

Solution

Skytap Cloud supports datacenter-native applications as is, so the business was able to migrate its application suite unchanged. Using Skytap Cloud, teams are able to configure environments once, then save them as templates that can be cloned in seconds, eliminating configuration drift, provisioning times, and environment hoarding. With Skytap Cloud's ability to clone, the team of 500 engineers are able to achieve 20% efficiency, focusing on delivering software faster.

Process Modernization

With Skytap Cloud, application teams are able to access, clone, and share application environments with a single click. Environments match production settings and can be integrated with existing CI/CD tooling. This on-demand access to consistent, production-ready applica-

tion environments enables parallel work streams, so teams can accelerate and automate the development process from build through deployment. Ultimately, enterprises are able to push higher quality software with faster release cycles.

Media and Entertainment Group Accelerates Release Cycles With Streamlined Testing

One of the largest media groups in the world runs their TV business with a complex TV scheduling application. In order to meet customer demand for new digital services and content, the team application needed to accelerate the deployment of new features and functionality, while ensuring the quality of code deployed to production.

[Read the Full Case Study](#)

Challenges

The customer's application delivery was severely limited by a bottleneck in the regression testing suite. Over 1,000 test cases needed to run daily to support the multiple business units depending on the program scheduling application. However, each testing process took nearly two months because only a single server was available to run the tests. Facing inadequate test coverage, delays in new feature releases, and even outages caused by bugs making it into production, the team knew dramatic change was necessary.

Solution

Today, the company's application teams have full control over their Skytap Cloud environments, and they're delivering value to the business faster. With only a single click, environments can be provisioned, cloned and shared for nimble testing and bug remediation.

With Skytap Cloud, the team can spin up to 50 environments from a saved template and run their test cases in parallel, cutting the full testing cycle from 45 days to hours. Testing coverage has increased from 20% to 100%, resulting in a significant decrease in defects passed to production. Furthermore, the company integrates Skytap Cloud with IBM UrbanCode Build and Deploy to implement continuous integration and delivery.

"This is the most powerful DevOps cloud I've ever encountered. It's enabled us to improve code quality by orders of magnitude. Without Skytap Cloud, we would've never been able to achieve these levels of quality and enterprise-grade consistency across multiple business units and applications."

— John Comas, Manager of Platform DevOps

Architecture Modernization

With Skytap Cloud, businesses don't have to refactor or rewrite entire applications before they can take advantage of cloud capabilities. Skytap Cloud accelerates application architecture modernization by providing a platform to introduce microservices, infrastructure as code, and third-party cloud services.

With Skytap Cloud, teams can work to systematically augment or replace tradi-

tional application components while still preserving core component functionality. These hybrid applications leverage traditional components and cloud-native components and can span multiple clouds and datacenters; they embody the incremental approach to modernization in physical form, enabling organizations to drive more business value and deploy more efficiently without starting from scratch.

ISV Integrates IBM Watson to Deliver New Business Value with Skytap Cloud

An independent software vendor (ISV) provides Interactive Voice Response (IVR) solutions to major businesses worldwide. Its technology allows enterprises to scale on-demand for thousands of incoming and outbound customer calls every second.

[Read the Full Case Study](#)

Challenges

The business needed to offer its IVR solution as a SaaS product, as well as integrate with new services, to innovate and compete. However, the IVR platform was developed and run on data-center hardware with a mix of AIX and Linux VMs. This limited, on-premises configuration prevented three key requirements to achieving the business' goals: elastic scaling to meet SaaS call volume, introduction of new technologies and approaches (e.g., AI, containers, PaaS), and the rapid release cycles necessary to support product innovation.

Solution

The business used Skytap Cloud's phased approach to modernization, enabling it to address each challenge iteratively. Because Skytap Cloud supports both Power/AIX and x86 workloads, the business was able to modernize infrastructure by rapidly migrating IVR workloads out of its datacenter. Once in Skytap Cloud, teams could move towards agile development and DevOps, accelerating time to value for business customers.

With Skytap Cloud, the business is able to offer its IVR product to customers as SaaS solution with next-gen capabilities, making it an innovation leader in its industry.

The business modernized the application's architecture by using a multi-cloud approach to integrate the core IVR application running in Skytap Cloud with innovative services from IBM Cloud. This hybrid application connects to IBM Watson services, including Text to Speech, Virtual Agent, and Conversation, so IVR customers can leverage the power of Watson to improve customer experience and insights. Containers are under consideration to optimize delivery and management even further.

6. CONCLUSION

The reality for many enterprises is that modernization is both absolutely critical and extremely daunting. To achieve success, you need a proven approach and the technology to make modernization possible.

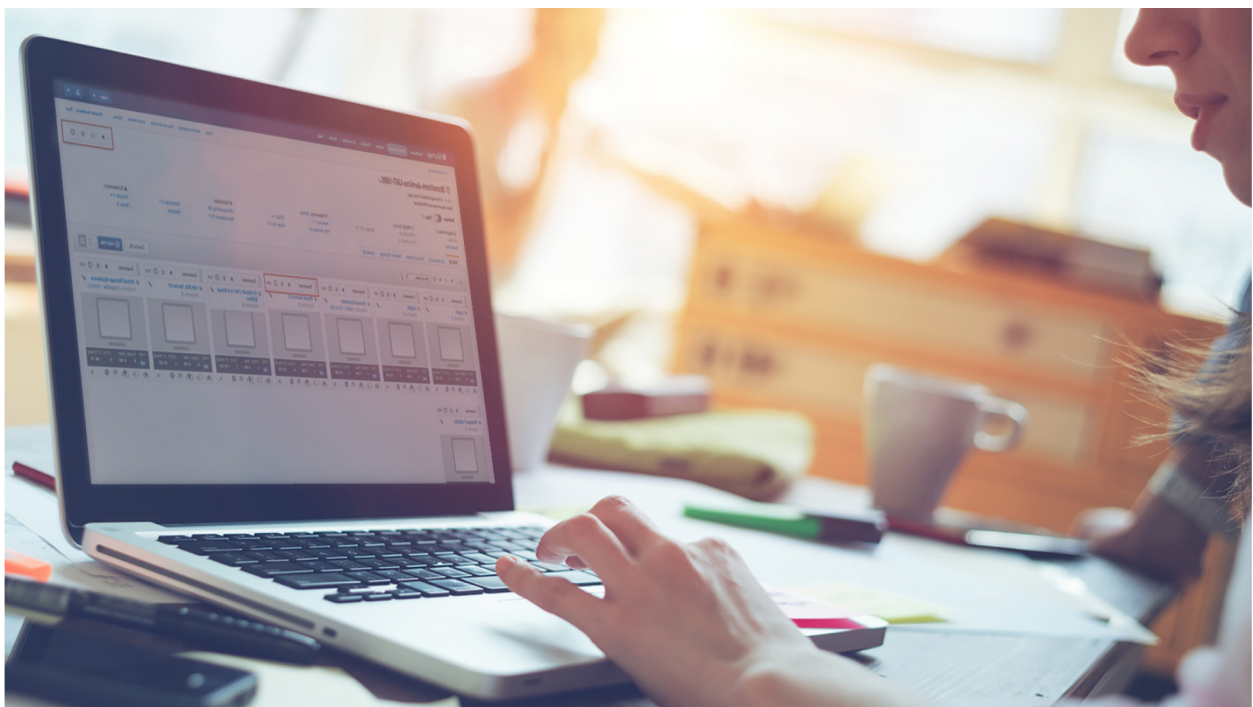
Skytap Cloud is **the only public cloud specifically designed to migrate and modernize traditional enterprise applications**. IPA offers an incremental approach that makes a modernization initiative both realistic and achievable. By using the IPA approach to modernization, enterprises are able to evolve at the pace and stage that's right for their business.

Skytap Cloud provides the platform to support traditional applications at each

stage of modernization, from the adoption of cloud infrastructure, to the acceleration of application development and delivery, to incorporation of cloud-native and next-gen technologies. With Skytap Cloud, you can bridge the gap from legacy to leading edge.

For deeper insight on how to apply IPA, download our follow up white paper, "A Practitioner's Guide to Enterprise Application Modernization".

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