



IDC Business Value Executive Brief

The Business Value of Cloud-Based Application Development Solutions

Sponsored by: IBM

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EXECUTIVE SUMMARY

This IDC Business Value Executive Brief leverages IDC's research into the value of cloud-based application development and integration solutions, including solutions such as IBM WebSphere Application Server (WAS) on cloud. These solutions not only enable application development in a hybrid cloud environment but also allow organizations to connect existing on-premise applications to cloud-based services. IDC's research shows how organizations can achieve significant value across different areas of the enterprise by moving from on-premise-focused application development to cloud-based solutions such as IBM WebSphere on cloud. Organizations implementing cloud-based application development solutions reported achieving the following benefits:

- Improved ability to match application development capabilities to business demand by increasing agility and accelerating the application development life cycle
- Facilitated business continuity and improved application reliability by reducing application downtime
- Improved productivity of IT departments by spending less staff time maintaining infrastructure
- Reduced IT infrastructure costs and components including the number of physical servers required to support application development

CHALLENGES FACING ORGANIZATIONS TODAY

The wave of digital transformation sweeping business today has been the focus of much IDC research. More and more digital products and services are being built to complement or supersede existing products and services. This is observable in the market at a much greater scale than just 12-18 months ago. Many companies are investing in digital transformation teams and centers of excellence to enable internal groups to adopt the practices of technology disrupters.

Over the past decade or two, almost every vertical has seen the emergence of new iconic companies that have dominated mindshare in the space and sent existing nondigital companies to the drawing board in a long-term struggle for relevance or even survival. For example, companies such as Amazon began disrupting retail 20 years ago, initially with books but now in almost every aspect of retailing. Soon after Amazon, companies such as Google and Facebook began to change established advertising models and the attending media landscape that had grown to depend on these models. Even more recently, companies such as Airbnb and Uber started revolutionizing hospitality,

real estate, and transportation in ways that are only beginning to be digested by established players (witness General Motors' announcement in early 2016 to invest a half billion dollars in Uber's competitor Lyft).

Even technologies centered on mechanical engineering innovation have begun to rely on software and digital innovation to evolve. Companies such as Tesla and VIA Motors are in the process of revolutionizing the car and truck markets, starting with software-centric innovation in both factories and vehicles. Similarly, although somewhat lower on the maturity scale and operating on even longer disruption cycles, companies such as SpaceX, Blue Origin, and Virgin Galactic are causing ripples in the established aerospace and defense industries. Again, the heart of the shiny new mechanical objects is a level of sophistication and innovation in the use of software.

The implication of digital transformation is that all companies are having to rethink their software development competency and are beginning to imitate their disrupters in software development practices. Companies old and new have come to the understanding that software is the most critical part of any new offering, and the center of business strategy in any field is the software innovation inside new products and services. This has put a high focus on software development as the key competency that enterprises need to move forward in the digital age. The software revolution is being catalyzed by the pillars of what IDC has referenced as "the 3rd Platform of technologies," namely, the shift to cloud, mobile, social, and big data analytics. In this context, the shift to cloud specifically represents one of the most effective approaches to help put software development on a more agile and productive trajectory.

In this light, IBM has combined infrastructure, platform, and development services under a common cloud platform organization focused on the Bluemix brand to become a high-scale cloud provider. IBM's new software capabilities, including the company's Watson cognitive development offerings, MobileFirst technology, DevOps tools, and wide-ranging analytics, big data, and IoT supporting services and partnerships, exemplify opportunities for IBM across the software portfolio. One of the long-running anchors of success for IBM's platform has been the company's Java WebSphere Application Server, which the company has made available in the cloud with the IBM WebSphere on cloud offering.

THE BUSINESS VALUE OF CLOUD-BASED APPLICATION DEVELOPMENT

Modern enterprises now realize they need to continually innovate and transform. Enterprises are also discovering they need new software development competencies to carry through this transformation unlike what they have been practicing. In the past 5-10 years, IDC has seen a variety of new techniques make inroads in the enterprise. For example, enabled by advancements in testing automation, continuous integration (CI) is reaching mainstream adoption in enterprise development shops. IDC is also witnessing an increase in the adoption of test-driven development techniques, which prescribe that the tests be developed prior to the code to ensure complete coverage and provide a level of assurance that the requirements are captured with some fidelity. In addition, new approaches to application architecture and operation, such as microservices and DevOps, have emerged to leverage faster networks by building distributed systems with smaller code modules connected by well-defined APIs and managed and maintained by unified teams accountable holistically and seamlessly for both application development and operations. An important underlying enabler behind many of the new approaches that have come to define modern application development is cloud architecture. When combined with the capabilities of modern cloud infrastructure or software sold to enterprises to run private clouds, modern application development approaches can be kicked into higher levels of agility and productivity than have ever been seen in the past.

To understand the benefits of cloud-based application development platforms, IDC conducted research with organizations building an average of 16% of their applications on such cloud-based platforms that intend to extend their use of cloud-based platforms to a further 28% of their application environments. The benefits associated with cloud-based application development solutions for these organizations are discussed in further detail in this IDC Business Value Executive Brief.

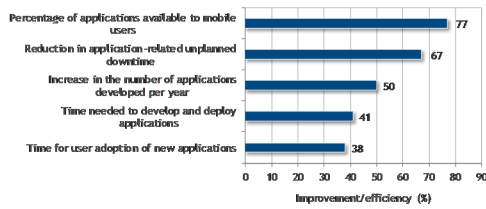
Supporting Business Agility and Growth with Cloud Application Development

Organizations utilizing cloud-based application development solutions are able to rapidly deploy environments for application development, testing, and production by reducing the time needed to provision, configure, and integrate various infrastructure components compared with their legacy on-premise-focused environments. In addition, as business needs and workloads change, cloud-based application development environments have the ability to scale and meet demand without needing to provision infrastructure resources. Cloud-based application development platforms accelerate innovation by empowering organizations to quickly translate ideas into real applications and develop those applications with the agility required to produce actual business outcomes. These platforms simplify the application development process and substantially shorten the lengthy cycle of configuring and provisioning different infrastructure components such as servers and storage while leveraging services and capabilities within cloud platforms to make steps such as application coding, design, and integration more efficient. This enables organizations to align application development with business objectives. The accelerated application development cycle can also be attributed to the centralized nature of cloud-based platforms. Application developers are able to collaborate during the application development cycle and work simultaneously on developing applications irrespective of their location. It is evident from Figure 1 that cloud-based application development platforms allow organizations to develop a greater number of applications, accelerate the time needed to bring applications to market, and decrease the time required by end users to adopt applications.

Organizations considered by IDC for this document that have moved to cloud-based platforms from legacy environments reported a 41% reduction in the time required to develop and deploy applications. Meanwhile, to help facilitate business growth, these organizations have increased the number of applications developed per year by 50% compared with their previous on-premise-focused efforts.

FIGURE 1

Application Development-Related KPIs for Organizations Using Cloud-Based Application Development Solutions



Source: IDC, 2016

IDC's research shows that apart from enhancing the application development cycle, organizations can leverage cloud-based application development platforms to increase the percentage of applications available on mobile devices. As the paradigm shifts away from laptops and desktop computers to mobile devices, interfacing with applications on mobile devices has become a priority for organizations. With this in mind, many organizations are reengineering software applications in a manner that meets end-user expectations with regard to mobile compatibility and accessibility. Interviewed organizations that are developing applications on cloud-based application development platforms have increased the availability of applications to mobile users on average by 77%.

Improved Application Reliability

IDC's analysis has discovered that organizations utilizing a cloud-based application development solution are able to reduce business and operational risk and increase end-user productivity by making their business applications more robust and reliable. In addition, moving applications to a hybrid cloud environment can help organizations avoid application downtime through ease of making changes to applications and automated upgrades and patching as well as features such as automated failover and disaster recovery. IDC's research shows that applications developed and running on the cloud experience an average reduction of 67% in the number of downtime instances. The reduced application downtime results in greater user satisfaction and productivity among internal and external application users.

Optimizing IT Infrastructure Costs

Organizations utilizing cloud-based application development platforms are able to achieve the business benefits discussed previously while reducing their costs related to IT infrastructure because they require less infrastructure to support business applications. Cloud-based application development platforms enable organizations to adopt a "pay as you go" approach based on business requirements.

Cloud-based application development platforms also facilitate the self-provisioning of infrastructure for application deployment and eliminate the need to invest in physical servers that are often underutilized.

IDC's analysis shows that organizations utilizing cloud-based application development platforms can reduce the number of physical servers required to support their operations by an average of 29%, with additional savings in areas such as power consumption and datacenter space related to operating these servers.

Making IT Staff More Productive and Efficient

The use of cloud-based application development platforms can have a significant impact on IT departments. When an organization moves to a cloud-based application platform, it can substantially reduce its on-premise infrastructure. As a result, IT departments become more productive, with fewer IT infrastructure components such as servers, networks, and storage systems to manage, allowing organizations to potentially reallocate IT staff time to other strategic areas. IDC's research shows that as a result of implementing a cloud-based application development platform, IT staffs spend an average of 20% less time "keeping the lights on." Further details are shown in Table 1.

TABLE 1

Typical Impact on IT Staff – Efficiencies from Using Cloud-Based Application Development Solutions

| | Efficiency (%) |
|--------------------|----------------|
| Server management | 25 |
| Storage management | 42 |
| Network management | 33 |

Source: IDC, 2016

IBM WEBSHERE ON CLOUD

IDC believes that the benefits of cloud-based application development platforms apply to IBM's WebSphere Application Server on cloud offering (WebSphere on cloud). IBM's WebSphere Application Server (WAS) anchors IBM's broad portfolio of application development, quality, platform, and integration offerings, a category that adds up to \$32 billion in revenue worldwide (in calendar year 2015 according to IDC's Software Tracker) and is led by IBM with over \$7.5 billion in license, support, and cloud revenue.

WebSphere on cloud enables organizations to develop, run, and manage applications in the "cloud place" that best meet business and operational demands, factoring in security, performance, and cost savings. The latest release, WebSphere V9, provides new capabilities to create new cloud applications, connect existing applications (on-premise or off-premise) to IBM Bluemix cloud services, and optimize existing applications.

WebSphere Application Server for Bluemix, an example of optimizing existing applications, is WAS running in a hosted virtual machine instance on the IBM Bluemix cloud in a multi-tenant environment. WebSphere for Bluemix also offers a single-tenant environment. Customers have a choice of deploying one of two versions of WAS – traditional or Liberty. WebSphere for Bluemix is supported by the same management and development tools and can be used for migrated workloads or new workloads.

IDC believes that in addition to efficiencies in developing applications using a cloud-based application development platform, organizations using WebSphere on cloud can potentially achieve additional benefits, particularly with regard to moving existing on-premise WAS applications to the cloud and integrating on-premise and cloud-based applications. These benefits, listed as follows, can provide organizations with additional value as they host and develop more of their applications in the cloud:

- WebSphere for Bluemix allows organizations to move existing on-premise WAS applications to the cloud with relative ease because IBM has preconfigured the operating system, middleware, and runtime for WAS. This reduces migration costs and offers the opportunity to realize the efficiencies of a cloud environment faster.
- WebSphere on cloud provides the option of either WebSphere Liberty or the traditional WebSphere Application Server to be run in a hosted cloud environment on the Bluemix cloud. Organizations can use this technology to connect existing WAS applications, whether on-premise or off-premise, to Bluemix services (including Watson) and leverage existing WAS scripting, development, and management tools.
- WebSphere on cloud empowers organizations to create scalable APIs that connect a variety of different on-premise and cloud-based applications, including mobile, IoT, and web applications, to Java applications. This enables organizations to integrate their expanding application environments more cost effectively and efficiently and helps simplify the process of moving applications to a hybrid cloud environment.
- With its limited footprint and a fast start-up time, WebSphere Liberty enables developers to assemble, secure, test, and deploy microservices offering continuous delivery, which is needed to gain faster time to market. A single management interface for both Java and Node.js enables more efficient DevOps and more efficient deployment and management of cloud-based applications.
- Organizations utilizing WebSphere on cloud can potentially reduce their capital expenditure and operating costs by investing in the technology stack according to business demands through flexible pay-as-you-go pricing.

Overall, WebSphere on cloud allows enterprises to take advantage of the agility, productivity, and flexibility of cloud-based deployment models.

CHALLENGES AND OPPORTUNITIES

IBM faces the following key challenges and opportunities with this technology:

- Migrating applications to the cloud is a complex undertaking because older applications have a variety of dependencies on existing on-premise systems and technologies selected to run in custom in-house configurations. In-depth assessments are often required to analyze and understand an application's full dependency sets and the consequences of moving key components to the cloud. Often, databases and other integration middleware may be found to be in need of colocation with the app server to avoid more complex hybrid arrangements. Clients looking to move workloads to the cloud should be prepared to analyze their applications to understand such dependencies. IBM has a full portfolio of application analysis and migration services that can be brought to bear on this problem if needed.
- Application servers worldwide have seen a revenue decline, according to IDC data. The overall trend in the application server space is a shift toward a more diversified approach to platform technologies operating at multiple levels of abstraction and, in many cases, involving open source platforms and tools. IBM is investing heavily across this broad space and specifically in modern development languages and areas of growth such as with its StrongLoop acquisition and its support of Apple's now open sourced Swift language behind OpenWhisk while it continues to invest heavily in WebSphere on cloud. IBM's cloud opportunity focuses on supporting enterprises with a high level of service and support, which, as this document shows, can create faster time to value, make application development efforts more effective and efficient, and reduce the costs associated with developing and supporting applications. IBM will likely be leveraging this overall trend in application development as the cloud shift plays its full cycle with the majority of its customers over the next five years.

CONCLUSION

Overall, IBM has begun to see early results from its investments and alignment around IDC 3rd Platform technologies. IDC notes that IBM's 3rd Platform alignment has begun to show results and stands a good chance of turning the company around toward an overall growth trajectory. IDC research shows that organizations adopting cloud-based application development platforms such as IBM WebSphere on cloud can realize a diverse spectrum of business and operational benefits. They are able to enhance the impact of their business applications by accelerating the application development process, increasing the rate of growth of new application development, encouraging mobile-based functionality, and reducing application downtime. Developing applications on the cloud also enables organizations to optimize their IT infrastructure environment and increase IT staff productivity. IDC believes that benefits attainable through cloud-based application development platforms such as IBM WebSphere will continue to facilitate business growth, agility, and higher productivity within organizations.

APPENDIX: METHODOLOGY

IDC compiled the data used in this document from interviews conducted in the past year with organizations using cloud-based application development platforms such as IBM WebSphere on cloud in the context of their broader application development and cloud migration strategies. These organizations have moved to cloud-based application development and integration solutions from environments that were generally based on using on-premise infrastructure and tools. Interviews were designed to obtain qualitative and quantitative information about the impact of cloud-based application development and integration platforms on organizations' business operations, staff, and costs.

About IDC

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