

Understanding the Business Value of IBM WebSphere Liberty



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Table of Contents



CLICK ANY HEADING TO NAVIGATE
DIRECTLY TO THAT PAGE.

Business Value Highlights	3
Executive Summary	3
Developer Benefits	3
Business Productivity Benefits	4
Application Performance Benefits	4
Reduced Costs	5
Sustainability Benefits	5
Situation Overview	6
Liberty	7
The Business Value of Liberty	7
Study Firmographics	7
The Choice and Use of Liberty	8
Business Value and Quantified Benefits	9
Developer Benefits	11
Enhanced Productivity	11
Increased Developer Satisfaction	15
Augmented DevSecOps Capabilities	16
Staff Benefits	16
Application Performance Benefits	19
Business Enablement Benefits	21
IT Cost Savings Benefits	23
ROI Summary	25
Challenges/Opportunities	27
Challenges	27
Opportunities	27
Conclusion	28
Appendix 1: Methodology	29
Appendix 2: Supplemental Data	30
About the IDC Analysts	32

Business Value Highlights

Click each highlight below to navigate to related content within this document.

➡ **328%**
three-year ROI

➡ **11.8 months**
to payback investment

⬆ **31%**
more productive
development teams

⬆ **21%**
greater developer
satisfaction

⬆ **40%**
more applications
released per year

Executive Summary

Cloud-native development, or development that is optimized for the cloud, delivers a multitude of benefits to developers, development teams, and organizations. This optimization brings the automation of the cloud to applications and their associated development stacks. For example, cloud-native development stacks are exemplary of attributes of cloud infrastructures such as auto-scaling, high availability, and self-service provisioning. In addition, the support of cloud-native applications for microservices, containers, container orchestration frameworks, and DevOps processes increases development-related automation.

According to IDC research, organizations that use IBM WebSphere Liberty (Liberty), a cloud-native Java application server, have realized the following benefits:

Developer Benefits

- **Enhanced productivity:**

The development-related automation specific to Liberty empowers developers to push code to production faster, thereby leading to faster release cycles and more rapid identification and remediation of development-related issues. With Liberty, developers can create and iterate on digital solutions more rapidly as a result of developer-friendly features and functionality such as fast start-up times, streamlined configuration, support for integrations

with DevOps technologies, and an expansive ecosystem of extensions. These features collectively increase developer productivity and empower developers to enhance the digital solutions they build. Developers can perform more work in less time, which accelerates the execution of an organization's digital transformation initiatives.

- **Increased developer satisfaction:**

Liberty amplifies developer productivity by allowing developers to spend more time working on higher-value development tasks such as conceptualizing and architecting applications. Moreover, Liberty provides opportunities for organizations to upskill developers on cutting-edge technologies, such as containers, Kubernetes, microservices, API gateways, and service mesh technologies. This upskilling of developers enhances developer satisfaction and lowers attrition because developers feel that they are augmenting their skill sets and keeping pace with developments in the industry.

- **Augmented DevSecOps capabilities:**

Cloud-native development platforms augment the security of digital solutions due to the microservices architecture of cloud-native applications. The architecture mitigates against the proliferation of security threats and breaches throughout an application. Developers can leverage Kubernetes to swiftly deprovision containers suspected of having a security vulnerability, thereby accelerating the resolution of security incidents as they arise. In addition, cloud-native development platforms integrate with cloud-native security solutions that specialize in the identification and remediation of container-native security considerations.

Business Productivity Benefits:

- Liberty's support for cloud-native development, along with its ability to accelerate developer velocity and enhance developer agility, enables organizations to deliver innovation faster than they typically can when using other application servers. This accelerated innovation strengthens the ability of organizations to update digital solutions in response to relevant changes in the business and regulatory landscape. Consequently, organizations can remain competitive by delivering cutting-edge functionality that responds to the changing needs of their customers.

Application Performance Benefits:

- Liberty enhances application performance because its lightweight architecture translates into faster start-up times, reduced memory consumption, low latency, and high application throughput. In addition, the platform's dynamic resource allocation capabilities and self-healing qualities increase application resiliency and availability.

Reduced Costs:

- Organizations that use Liberty reported significant cost savings derived from reduced licensing and infrastructure-specific costs, such as expenses related to cores, power and cooling, and colocation. Given Liberty's lightweight architecture, organizations use fewer cores to run the same workloads compared with other Java application servers. In addition, Liberty enhances the operational efficiency of infrastructure management due to the increased agility specific to provisioning and deprovisioning containers, enabling organizations to optimize the use of hardware for their fleets of applications. As a result, organizations can run more workloads with fewer infrastructure resources and correspondingly save on infrastructure, licensing, and labor costs.

Sustainability Benefits:

- The reduced infrastructure costs related to the diminished use of cores, power, cooling, and colocation means that Liberty positions organizations for enhanced sustainability practices. As sustainability continues to increase in priority amongst business and technology leaders, adoption of sustainable software and practices will be critical. The combination of Liberty's lightweight architecture and dynamic resource allocation allows organizations to take advantage of fewer resources while still enhancing application performance and saving costs.

IDC conducted research that included a series of in-depth interviews with organizations using Liberty. The research examined the business value specific to the development and operational management of cloud-native applications. In addition to the benefits enumerated above, key findings showed that the use of Liberty results in enhanced application portability, granular application scalability, and improved resource consumption.

IDC calculates that these interviewed IBM customers will achieve benefits that amount to \$28,000 or ~17% of a developer's salary for every developer in an organization. This will:

- **Optimize** the performance of application development teams, leading to more quality applications, features, and updates released to end users and customers

- **Enable** IT teams to deliver more value by reducing routine operational work, freeing up time for high-value IT projects and more effectively serving the needs of developers and development teams
- **Minimize** the unavailability of applications by reducing the frequency and duration of unplanned downtime events
- **Improve** business performance by optimizing analytics and other data-related business transactions

Situation Overview

Recently, organizations have increased the attention paid to developers because developers can influence the conceptualization and vision of digital transformation initiatives. While developers were once responsible primarily for creating code, they now enjoy a seat at the table when it comes to developing digital transformation strategies. As a result, developers can now create digital solutions and conceive designs for solutions in collaboration with customers and key stakeholders. Data from IDC's *Developer View*, a global survey of 2,500 developers, indicates that developers influence approximately 66% of IT spending in a range of areas, including developer tools, cloud adoption, legacy application modernization, and the implementation of AI and ML.

The increased importance of developers has spawned in-depth research on the drivers of their satisfaction and the salient attributes of developer tools and platforms that contribute to their adoption. IDC developer research has shown that the attributes of developer tools such as automation, self-service provisioning, collaboration functionality, and rich user experience were key contributors to developer happiness and, by extension, their decision to adopt select developer tools and platforms. IDC notes that IBM WebSphere Liberty, a lightweight Java application server that specializes in cloud-native applications and workloads, features a multitude of attributes of developer tools that are desired by contemporary developers, such as its acceleration of developer velocity, amplification of developer productivity and enablement of developer satisfaction. In addition, the research presented here illustrates how Liberty, as a cloud-native development platform, augments application performance, reduces costs, enhances innovation, reduces time to market, increases customer satisfaction and bolsters application security.



The benefits of Liberty include accelerated developer velocity, increased developer agility, enhanced application portability, granular application scalability, improved resource consumption, and faster innovation.

Liberty

IBM WebSphere Application Server and Liberty are Java application servers that host Java applications. Liberty differs from traditional J2EE Application Servers because it specializes in cloud-native applications that are optimized for deployment in public clouds, such as the IBM Cloud, Microsoft Azure, Google Cloud Platform, and Amazon Web Services. Liberty supports microservices architectures characterized by a modular approach to application development and hosting. One important benefit of Liberty's support for microservices architectures is its reduced application footprint in comparison to traditional J2EE application servers. The reduced application footprint enables faster start-up times and reduced start-up memory consumption for the applications it runs, thereby rendering it optimal for applications that prioritize efficient resource consumption. Other important attributes of Liberty include its support for containerization, agile development practices, and Java EE/Jakarta EE and MicroProfile specifications.

Liberty's specialization in cloud-native applications means that it supports development practices that leverage microservices, containers, container orchestration frameworks, application programming interfaces (APIs), and DevOps practices such as continuous integration and continuous delivery. More broadly, Liberty is optimized for applications that are characterized by frequent deployments or updates and the rapid provisioning of infrastructure-centric resources such as containers. As a lightweight Java runtime environment, Liberty's ability to optimize resource consumption also enables customers to effectively manage costs associated with Java deployments.

The Business Value of Liberty

Study Firmographics

IDC conducted research that explored the value organizations achieved and the benefits they realized by using Liberty to support their enterprise applications. The research included interviews with 10 organizations that use the platform and have experience and knowledge about the benefits and costs associated with using it. During the interviews, companies were asked various quantitative and qualitative questions about the impact of Liberty on their IT operations, applications, core businesses, and costs.

Table 1 (next page) presents the study firmographics. The organizations that IDC interviewed had an average base of 85,660 employees and total average annual revenue of \$32 billion. This workforce was supported by 8,846 IT staff supporting 3,120 business

applications. In terms of geographic distribution, seven companies were based in the United States, with the remainder in Australia, India, and Spain. A wide variety of vertical markets was represented, including healthcare, financial services, insurance, construction, manufacturing, and pharmaceutical.

TABLE 1
Firmographics of Interviewed Organizations

	Average	Median	Range
Number of employees	85,660	55,000	600 to 275,000
Number of IT staff	8,846	3,400	16 to 40,000
Total number of business applications	3,120	675	6 to 20,000
Annual revenue	\$32B	\$5B	\$300M to \$95B
Countries	United States (7), Australia, India, Spain		
Industries	Healthcare (3), financial services (2), insurance (2), construction, manufacturing, pharmaceutical		

n = 10; IDC Business Value In-Depth Interviews, May 2023

The Choice and Use of Liberty

The organizations that IDC interviewed described typical usage patterns for Liberty. They also discussed their rationale for choosing it as a cost-effective way to continuously deliver secure, cloud-native applications that better meet customer demand. Study participants expanded on their decision criteria, citing that Liberty offered a useful way to modernize their entire technology stack while providing better cloud-based virtualization. They appreciated that the platform fostered easier migration to the use of containers and noted IBM's particular expertise in vulnerability assessment.

Study participants further commented on these benefits:

Stack modernization, manufacturing organization:

"In selecting Liberty, my organization was looking to take advantage of the cloud and speed up development, testing, and deployment. We pretty much wanted to modernize our entire technology stack."

Better virtualization and application throughout, pharmaceutical organization:

“We selected Liberty based on the overall advanced technology. Some of the main factors that led to this decision were development, coding, and the ability to be more efficient. My organization also wanted to have cloud-based infrastructure, which is the trend across the board in the industry. We needed better virtualization because we are a global company and greater speed, which has allowed for a higher throughput of things being put in applications.”

IBM vulnerability support, insurance organization:

“Liberty would give my organization portability. We also were looking to rely on experts for vulnerability issues or Log4J remediation that needs to happen. We knew we could always rely on a vendor like IBM, so there is some level of comfort.”

Easier migration, financial services organization:

“My organization studied several alternatives to Liberty. We selected Liberty because the migration from traditional WebSphere into Liberty was a lot easier than with any of the other alternatives. It would make that migration as fast as possible because Liberty was very compatible with what we already have. I wouldn’t say easy, but it was less complicated to be able to transition to containers using Liberty with some early proof concepts. We also found it was quite efficient in terms of compute power.”

Business Value and Quantified Benefits

IDC’s Business Value research illustrates how study participants use Liberty to continuously deliver secure, cloud-native applications that better meet customer demand. Liberty enables IT teams to deliver more value by optimizing application development and tasks, leading to an increased number and quality of applications, features, and updates released to end users and customers. Liberty also increases the productivity of various IT teams, including help desk and security teams, by reducing routine operational tasks, freeing up time to spend on high-value IT projects. In addition, companies minimized the costs and risks associated with application downtime by reducing the frequency and duration of unplanned disruptions. Liberty also helps these companies improve their overall business performance by speeding up analytical processes and other business-critical transactions and operations. Combined, these benefits generate positive business value in terms of operations and financial results.

Study participants commented on these benefits:

Reduced time to market, insurance organization:

“One of the most significant benefits of Liberty is the total time to market; our release cycles have reduced by 30%. The second is that we have modernized our entire landscape. On the cloud, we have redeployed 20% of our monolithic applications into microservices using Liberty. The performance improvement has been at least a 70%–80% reduction in the response time of my applications.”

Secure platform with strong toolset, construction organization:

“In selecting Liberty, we found that it provided us with a subset of tools that allowed us to live within the cloud but also integrate with other systems in the cloud. Overall, it provided a platform that was intrinsically secure simply out of the box, so we didn’t have to develop security around it. It allowed us to develop portable apps, which is common within Java space. And it allowed us to easily scale.”

Cost, time, and effort savings, healthcare organization:

“The most significant benefit is what we get back, the savings in cost, time, effort, all of those things. For example, to spin up a server for what we were doing in the old WebSphere application developer studio took 3–5 minutes. Now it’s taking anywhere from 45–90 seconds. We’re getting tremendous ROI there.”

Agility and speed, pharmaceutical organization:

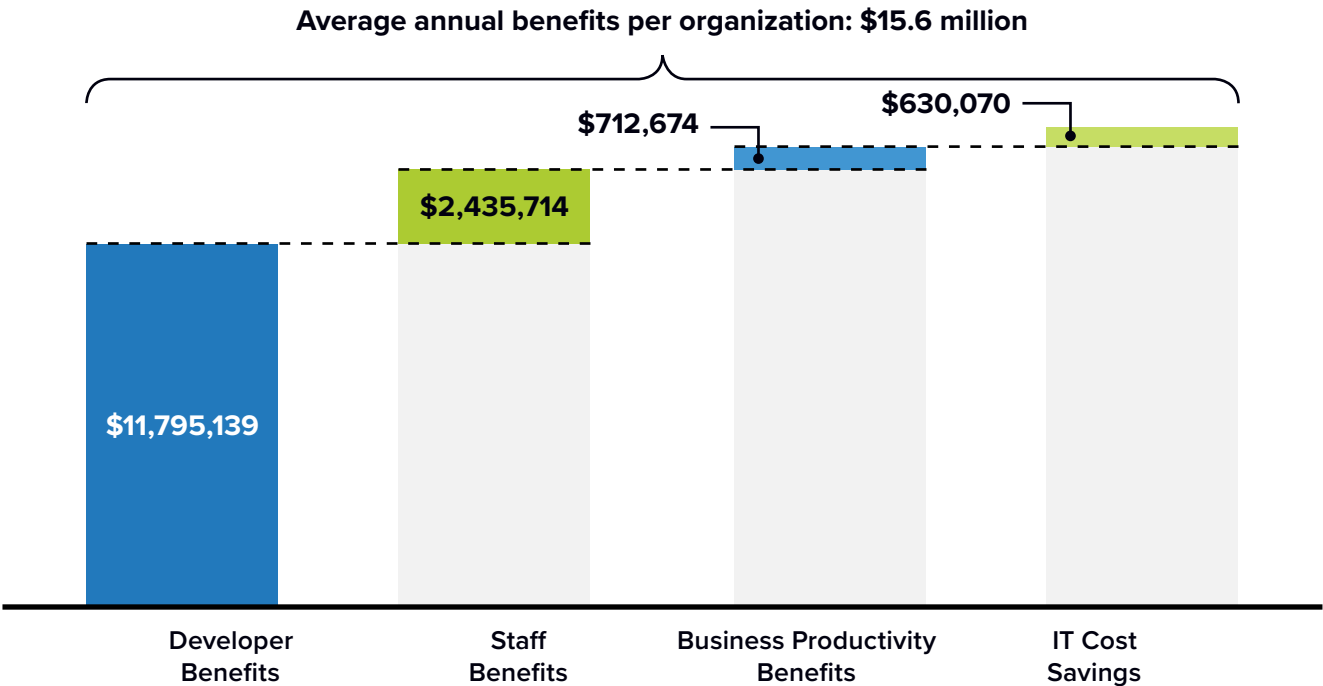
“The speed is the benefit from the programming/development side of the coin, as well as that the overhead to support it is much more efficient. Just to be able to perform in a more agile environment, our methodology gives a significant cost savings from a work standpoint.”

Increased customer satisfaction, financial services organization:

“The ability for reuse is the most significant benefit. You’re creating a single connection between application and application, and if a similar connection is required, you’re able to reuse it. It also enables us to adapt functionality faster and allows us to deliver to our clients at a higher pace because of the flexibility the tool provides and because of the reuse. The business is getting what it needs and getting the outcomes faster for the clients than previously. These days, ideally, everyone wants things faster, and the clients are happier when they get what they need.”

Figure 1 (next page) presents IDC’s calculations of cumulative customer benefits after the adoption of Liberty. The average annual benefits specific to Liberty are broken down into the four major contributing categories of Developer Benefits, Staff Benefits, Business Productivity Benefits, and IT Cost Savings, as shown below. Assuming that a developer’s average salary is roughly \$168,000, the business value of Liberty amounts to \$28,000 or ~17% of a developer’s salary for every developer in an organization.

FIGURE 1
Average Annual Benefits per Organization
(\$ per organization)



n = 10; IDC Business Value In-Depth Interviews, May 2023
For an accessible version of the data in this figure, see [Figure 1 Supplemental Data](#) in Appendix 2.

Developer Benefits

Enhanced Productivity

One of the salient benefits of Liberty is its ability to accelerate developer productivity because of its foregrounding of microservices to architect applications. Microservices enable discrete development teams to work in parallel by empowering them to work on discrete application functionalities at the same time; one development team does not have to wait for another team to complete work or obtain approval from a centralized governance authority. Moreover, the ability of container orchestration technologies, such as Kubernetes, to manage the scaling of container clusters enhances development-related automation by managing the provisioning, deprovisioning, scaling, and self-healing of containers and their corresponding applications.

IDC's examination of the business value of Liberty illustrated its ability to enhance developer productivity. The increased automation specific to the Liberty platform empowers developers to ship code faster, as illustrated below.

Study participants reported that Liberty resulted in substantial reductions in application development and deployment time in addition to instant provisioning functionality as well as streamlined collaboration between developers.

Study participants elaborated on these benefits:

Reduction in application development and deployment time, healthcare organization:

"If you want to develop an application and deploy it in the old way, [it takes] maybe two months to go through all the way from development to production. Now, it's just maybe two days with Liberty, provided everything is working and all the configuration management and billings criteria are there."

Instant provisioning, insurance organization:

"One of the most significant benefits for the development team is the instant provisioning that Liberty provides. My organization has also improved development time and application performance."

Instant application update feedback, healthcare organization:

"In the traditional WebSphere, if you make a change to Java, you have to restart the server, which could take anywhere from 1 to 30 minutes. Liberty offers some new tooling that can essentially update the application server without restarting it. So, I could change one line of code in the old stack and not be able to get feedback on it for one hour, and now, I can get feedback instantly."

Strong application deployment functionality, healthcare organization:

"Liberty achieved our migration costs goals and gives us application developer flexibility. The traditional way is tough because the developer has to wait for the administrator to get his application deployed. Liberty brings application deployment into the CI/CD pipeline. The value of Liberty is its function set."

Less complex application ecosystem, insurance organization:

"Instead of building large monolith applications, you have a simpler and less complex application ecosystem because you are separating monolith to microservices architecture. Liberty gives us the ability to manage specific service instances and not impact the entire application ecosystem. We can now target specific updates to a specific service at any point in time. Also, rolling updates, we could not do that with network deployment type of architecture. With Liberty, we can do rolling updates throughout the day."

DevSecOps approach to application development and deployment, healthcare organization:

"The most significant benefit of IBM WebSphere Liberty is definitely better developer ability."

Liberty gives our developers a full DevSecOps approach. It's a helpful tool for them to develop and deploy quickly. The applications will roll out through the CI/CD pipeline into our infrastructure."

To get a complete picture of post-adoption experiences with Liberty, IDC comprehensively evaluated its impacts beginning with development teams. In supporting migration to cloud-native development, the platform substantially reduced the complexity of creating, testing, and deploying applications. As a result, application teams are significantly more agile. This, in turn, helps them release more applications, features, and updates.

Liberty is a flexible solution for developing and deploying a variety of applications. The interviewed companies reported that their application management teams took full advantage of the automation that Liberty provided to manage and maintain workloads. This functionality helped them support their application environment with greater efficiency.

Table 2 quantifies these benefits. After adoption, interviewed companies saw a 31% productivity boost for their development teams. This improvement represents the equivalent of adding 170 full-time employees (FTEs) and resulted in an annual productivity-based business value of \$16,985,000 for each organization.

TABLE 2
Development Team Productivity Gain

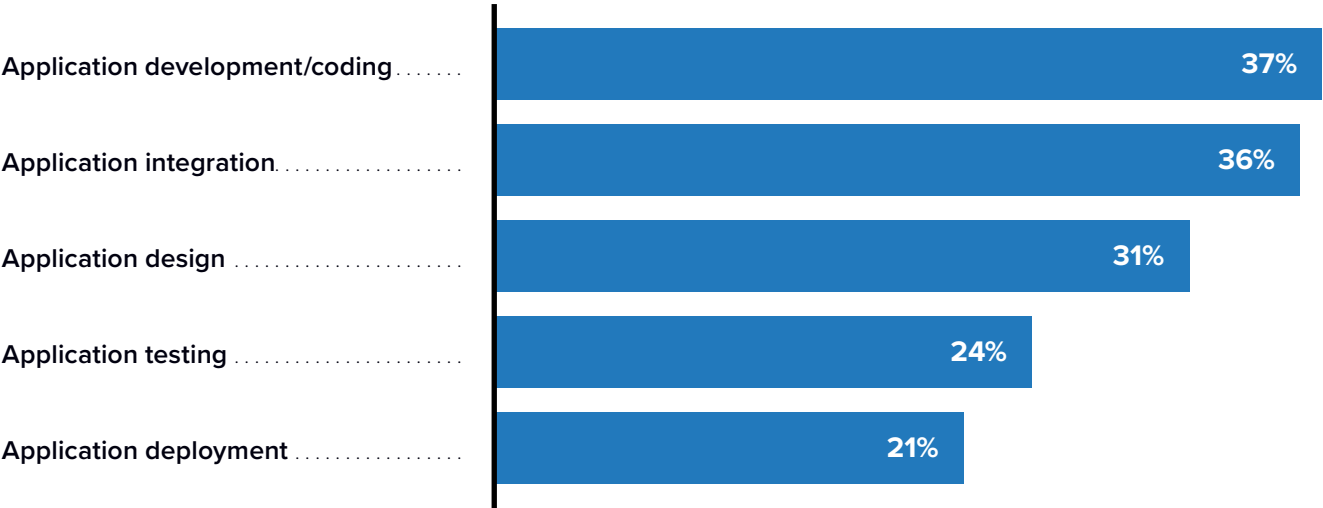
	Before Liberty	With Liberty	Difference	Benefit
Equivalent productivity level (FTEs)	553.0	722.9	169.9	31%
Value of staff time per year	\$55.3M	\$72.3M	\$17.0M	31%

n = 10; IDC Business Value In-Depth Interviews, May 2023

The interviewed organizations stated that Liberty has improved the efficiency of their development teams across several key functional areas. As one study participant noted: *"Application development and testing time has been drastically reduced with Liberty. As a result, people aren't waiting around; they can just move on to the next thing in the pipeline. In our traditional stack, deploying an application might take one hour, whereas with Liberty, it takes one minute, so it's orders of magnitude faster. And that's just for deployment."*

IDC evaluated these benefits by identifying and measuring key application design key performance indicators (KPIs). As shown in **Figure 2**, after adopting Liberty, the greatest efficiency improvements were seen in application development/coding (37%), application integration (36%), and application design (31%).

FIGURE 2
Application Delivery KPIs
(% more efficient)



n = 10; IDC Business Value In-Depth Interviews, May 2023

IDC then drilled down further on specific benefits for development teams. The IBM platform enabled interviewed companies to release applications on a rolling basis. They were no longer tied to large releases, and they did not need to provision appropriate resources. As one study participant working in the insurance sector noted:

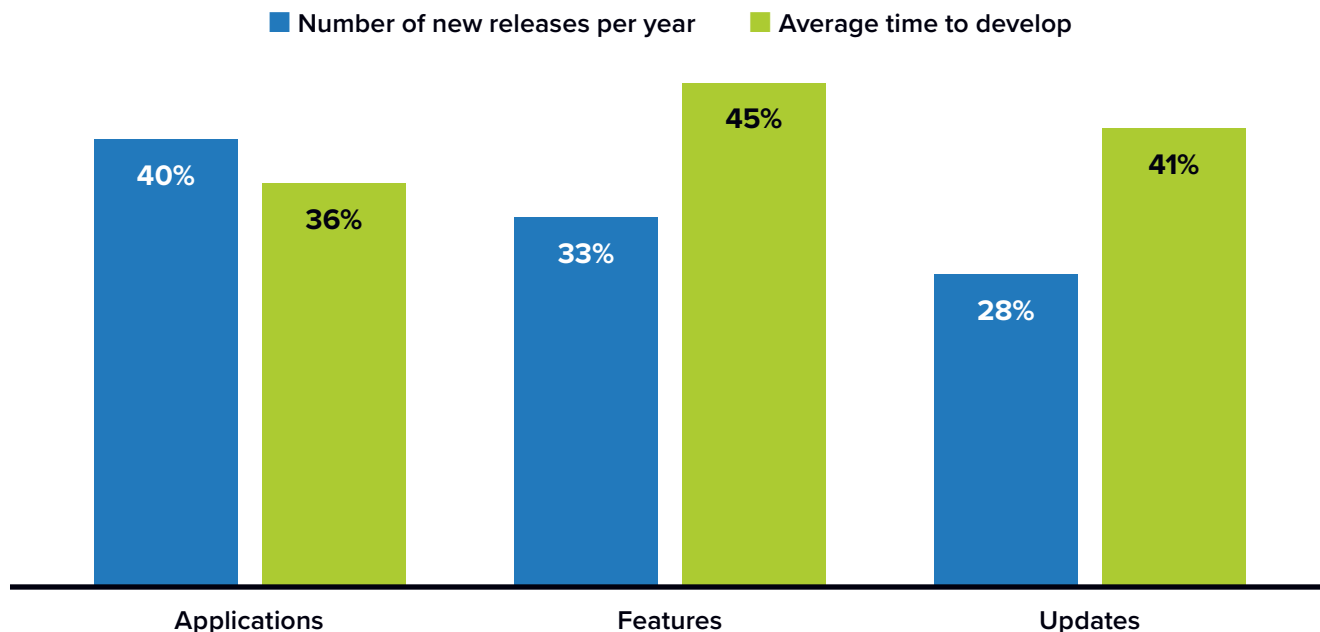
“The development time has reduced a bit with Liberty because developers are not developing or fixing complex applications. Liberty has given my organization the ability to target a specific service within the ecosystem. The frequency of release updates has gone up because we are able to do deployment whenever the feature or capability is ready, instead of targeting a large release and lining up resources for production or regression tests. The frequency of releases has gone up 20%–30% because of the nature of Liberty and the containers and the cloudlike experience. Every week you could have a deployment.”

As shown in **Figure 3** (next page), participants experienced substantive improvements specific to the development of applications as well as the delivery of new features and the implementation of updates. In terms of applications, participants developed 40% more new releases annually after deployment. Meanwhile, organizations decreased the average development time by 36%. Additional results are presented below for features and updates.

FIGURE 3

Liberty's Impact on Development Activities

(% more or quicker)



n = 10; IDC Business Value In-Depth Interviews, May 2023

For an accessible version of the data in this figure, see [Figure 3 Supplemental Data](#) in Appendix 2.

Increased Developer Satisfaction

Liberty's ability to accelerate developer velocity and amplify their productivity enables developers to spend more time on higher value development tasks that contribute to developer satisfaction because of a deeper alignment with their skills and unique strengths and capabilities. Moreover, Liberty fosters opportunities to work on cutting-edge development projects in ways that further increase job satisfaction and reduce attrition because developers appreciate the acquisition of new skills and capabilities.

IDC calculated that Liberty's ability to enhance the acquisition of skills on the part of developers resulted in 21% greater developer career satisfaction and 13% longer developer on-the-job tenure. Commenting on better job satisfaction, one study participant working in the insurance sector noted: *"I would say that because Liberty can be containerized, all the developers and support folks now have exposure to cloud-like technologies and support cloud-like environments, so you have more job satisfaction because you're now working on the latest and greatest from a cloud standpoint. I would think our attrition levels have gone down compared with other companies, and we're doing good because we're*

able to retain talent because of the transformation initiatives that we have to use the latest and greatest technology.” Another participant working for a pharmaceutical organization said about Liberty: “I would say it’s probably increased tenure because of giving new tools and up-to-date technologies. People usually jump ship when they’re not learning anything.”

Augmented DevSecOps Capabilities

Liberty is more secure than other J2EE application servers because they integrate security protocols and scans directly into development processes as part of a broader practice of DevOps adoption. The deepened integration of automated security analytics improves the ability of developers to identify security vulnerabilities and expediently remediate them. Additionally, the use of microservices to develop cloud-native applications limits the spread of security vulnerabilities due to those applications’ modular architecture. Moreover, developers can use containers and container orchestration frameworks such as Kubernetes to automate the deactivation and deprovisioning those containers identified as having a security vulnerability. Consequently, developers and IT operations staff can better mitigate security threats and vulnerabilities once they have been identified.

Staff Benefits

In addition to providing positive impacts for development teams, Liberty also helps IT operators and data analytics teams fulfill their day-to-day tasks and responsibilities by making their efforts more productive. They appreciated that Liberty decreased coding time and easily accommodated fluctuations in workloads.

Study participants commented on these benefits:

Better security and analytics, pharmaceutical organization:

“Liberty has significantly decreased the coding time. The functionality and some of the analytics from a maintenance and security perspective are much better. It produces better statistics. From a development and configuration standpoint, Liberty gives me significant savings, and from a maintenance and monitoring standpoint, it allows me to get information quicker, with better analytics.”

Easy IT configuration and use, healthcare organization:

“Liberty gives my organization greater simplicity in the handling of workloads throughout the month because it fluctuates so much. Sometimes we’ll have a low volume, sometimes a high volume at the end of the month. Compared with other products, Liberty handles this very well. Liberty is easy to configure and to use from an IT team perspective. IBM support is more than enough; the library of information to troubleshoot or improve the product is available with quick and easy access.”

Strong security and ease of use, healthcare organization:

“Liberty is easy to use and has great security. Also, the agility of Liberty as far as adapting to other programs was huge for us. It has given us the ability to get things out quicker, as far as our programming needs are concerned, and our applications too. That whole process was shortened using the product, and the workloads in general were just calmer and not as spikey throughout the month compared with what we had before.”

Quick resolution of security issues, manufacturing organization:

“I appreciate the speed we can get to resolve security issues because of the software life-cycle process of the Liberty. Say, we get a CVE 10, which is the worst possible security issue you could have. In traditional WebSphere, it might take IBM three to six months to issue a fix for that, whereas in Liberty, they can issue the fix in a day or two, and we can have it rolled out everywhere. Some of these fixes could live for a year on traditional WebSphere, and now, it’s only hours.”

The interviewed organizations noted how Liberty enabled IT infrastructure teams to support more applications with greater efficiency. They noted that teams benefited from Liberty’s task automation and had far fewer incidents to troubleshoot, thereby easing the burdens on help desk teams. Interviewed organizations estimated that they received 32% fewer IT help desk calls after adoption.

Table 3 quantifies these benefits. As shown, interviewed companies saw a 13% efficiency gain in the work that their IT infrastructure teams did. This efficiency gain enabled 13.4 FTEs to spend more time supporting other important business initiatives. As a result, the interviewed organizations achieved an annual efficiency-based business value of \$1,343,445.

TABLE 3
IT Infrastructure Team (Non-Developer) Efficiency Gain

	Before Liberty	With Liberty	Difference	Benefit
Total FTE count	101.8	88.3	13.4	13%
Value of staff time per year	\$10.2M	\$8.8M	\$1.3M	13%

n = 10; IDC Business Value In-Depth Interviews, May 2023

Study participants also reported that the built-in security functionality of Liberty was a big advantage for their security teams. If a problem occurred, they appreciated that IBM support was available to backstop and help resolve incidents with speed. **Table 4** quantifies these impacts. After adoption, interviewed companies experienced a 35% efficiency gain for their security teams. Importantly, this team needed 15.6 fewer FTEs to secure applications with Liberty than their previous solution, resulting in an annual efficiency-based business value of \$1,562,956.

TABLE 4
Security Team Efficiency Gain

	Before Liberty	With Liberty	Difference	Benefit
Total FTE count	44.2	28.5	15.6	35%
Value of staff time per year	\$4.4M	\$2.9M	\$1.6M	35%

n = 10; IDC Business Value In-Depth Interviews, May 2023

The teams responsible for data analytics benefited from applications that were run on Liberty. The applications had less latency, ran reports effectively, and provided improved analytical results. **Table 5** shows these impacts. After adoption, interviewed companies experienced an 18% productivity gain and the equivalent of adding 8.6 FTEs. These benefits translated into an annual productivity-based business value of \$601,028 for each organization.

TABLE 5
Data Analytics Team Productivity Gain

	Before Liberty	With Liberty	Difference	Benefit
Equivalent productivity level (FTEs)	46.8	55.4	8.6	18%
Value of staff time per year	\$3.3M	\$3.9M	\$601,028	18%

n = 10; IDC Business Value In-Depth Interviews, May 2023

Application Performance Benefits

Liberty enhances application performance because its lightweight footprint and modular architecture result in faster startup times for applications, as well as reduced resource consumption. In addition, its support for microservices and container orchestration frameworks such as Kubernetes optimizes performance by dynamically allocating resources to ensure that only those microservices and their associated container-native infrastructures are deployed as needed. Moreover, Liberty's support for Kubernetes enhances the automated scaling of applications and increases application resiliency because of its self-healing, load-balancing, and automated scheduling and deployment capabilities. Java applications deployed on Liberty typically experience increased application throughput, reduced latency, accelerated startup times, reduced resource consumption, and fewer instances of unplanned disruptions or downtime.

IDC evaluated the impacts of Liberty's adoption on the use and performance of business-critical applications that were the foundation of the core business activities of the interviewed companies. This evaluation was performed with an emphasis on two critical areas: application downtime and application performance.

According to the study participants, Liberty mitigated the incidence of application downtime, thereby ensuring high levels of business continuity. In addition, the performance levels of these business-critical applications were significantly boosted. In particular, study participants highlighted what they described as Liberty's lightweight application management capability enabling them to load what is required on the fly. They pointed out the advantages of Liberty's better self-healing capabilities with fewer unplanned outages than what they experienced with previous approaches. By avoiding the chain of one application affecting others, the severity of incidents was minimized.

Study participants made these comments:

Lightweight application management, healthcare organization:

"Performance is really good for Liberty. It is improved quite a bit compared with the legacy by about 60%–80%. It is lightweight, so it's not unnecessarily loading any of those applications; it only loads what is required on the fly."

Better self-healing capabilities and fewer unplanned outages, manufacturing organization:

"We have fewer unplanned outages with Liberty. My organization takes advantage of the cloud platform, which offers scalability features, better availability, and self-healing in the case of our containerization, because in the old day, when something went wrong, we needed human intervention. Now, the software can recover from a lot of problems, and no human needs to be called at 3:00 a.m. Both time to detect and time to resolve outages are reduced. Another benefit is that, in the past, problems might go unnoticed for a long period of time, but now, with Liberty, we benefit from the software-driven stuff approach to finding problems."

Containers decrease unplanned downtime, financial services organization:

“I know that downtimes have decreased. This is mostly related to the older version of things, where if one application in a server of 50 applications went nuts and began eating up all the resources, that would impact all the other applications. The severity in the past was greater because one application could potentially affect many other applications. In the current model of containers from Liberty, each application is running its own instance of Liberty, so that cannot happen anymore. If one application goes down, it’s not taking any other application with it. It might get stuck, it might restart, but the problem is a lot more contained.”

Figure 4 provides IDC’s calculations for improvements in application downtime. As shown, after adopting Liberty, the number of monthly unplanned downtime incidents decreased by 34%. In addition, when incidents occurred, they were resolved faster, with the average time to resolve decreased by 18%.

FIGURE 4
Application Downtime KPIs
(% less)



n = 10; IDC Business Value In-Depth Interviews, May 2023

According to study participants, their development teams were more agile with Liberty. As a result, they could work to improve their applications, output over time with appropriate feedback from business units. Ultimately, this meant that better applications could be pushed out to business end users. The interviewed organizations also realized significant improvements in application performance. This has a significant impact on the business value chain, such as better analytics processing that benefits end users and fosters improved business decision making.

After the adoption of Liberty, the time organizations needed to execute business transactions reduced significantly (39%), as shown in **Figure 5** (next page). In addition, the time needed to run analytical queries and application latency reduced by 34%, and application latency was reduced by 32%.

FIGURE 5
Application Performance KPIs
(% less)



n = 10; IDC Business Value In-Depth Interviews, May 2023

Business Enablement Benefits

Liberty augments the ability of businesses to respond to the changing needs of its customers by facilitating the rapid delivery of product enhancements and innovation. For example, Liberty reduces the time to market for digital solutions by empowering developer teams to work in parallel on discrete microservices. The platform’s support for developers to work in parallel also amplifies the cadence of innovation and improves customer satisfaction by accelerating and streamlining the delivery of new features and functionality to end users. Additionally, the platform’s acceleration of developer velocity enables organizations to respond to changes in the business landscape faster by means of either new digital products or solutions, or updates to existing ones.

Study participants explained that they have enabled more efficient business operations by providing line-of-business employees with higher-performing and better-quality applications. With study participants running core enterprise applications on a daily basis, optimal application performance ensured that their employees had the tools to deliver maximum value within their organizations. In addition, the timely delivery of new applications and features had measurable impacts on employees’ job effectiveness.

Study participants reported that they were able to optimize key aspects of their business by getting better insights into customer behavior and improving their agility in meeting customer needs. They also noted that Liberty helped them better adapt to business growth and go to market faster.

Study participants elaborated on these benefits:

Deeper customer and business insight, construction organization:

“The platforms that we’ve developed, some of them are customer centric, and some are internal. Basically, it provides the internal business with more insight into our customers, and their ability to log in and provide machine data for us allows us to be more reactive to that customer information and pool information from our ERP and our consolidated data that we use the WebSphere for to develop some of these toolsets and to make smarter decisions within the business from a strategic and financial perspective: budget planning, spending, revenue, stuff like that.”

Agility to meet client needs, pharmaceutical organization:

“My organization has gained agility and the ability to quickly modify and change things without too much need to code. It’s more instant. That helps, especially for front facing to customers or client’s things; they can be changed more quickly on the fly.”

Better business agility, financial service organization:

“My business has gained the ability to enable their workflows in a more effective manner and for technology to provide what they need faster so they can service clients. We have recognized a lot more process efficiency as a result because they’re getting what they need from tying systems together that normally couldn’t be tied together. One use case: if we can provide a single pane of glass in the call center, and the call center can have a mashup of applications on their screen that can allow them to have not many clicks, which reduces the cycle time for the phone calls, and seconds per call are getting shaved off. That helps us ensure that we made our service-level agreements, but also, anybody in our call center call, if they can get off a minute earlier because of the efficiency of the call center rep, it makes people happier from a client satisfaction perspective.”

Responsiveness to business growth needs, healthcare organization:

“Liberty is a consistent product to help our business move as we add more to it; it doesn’t take a lot to add to it, and it’s very responsive to the requests that are being made as we grow.”

Ability to go to market quicker, insurance organization:

“A big benefit is that we can go to market quicker because Liberty is lightweight. My organization is able to develop solutions and capabilities faster.”

IDC then examined the financial impacts resulting from business enablement. The interviewed organizations directly correlated the use of Liberty to higher annual revenue. These gains were based on better supporting the needs of their customers and being more agile in responding to market demands, as previously described. In fact, interviewed organizations stated they were 28% faster going to market with services and products as a result of using Liberty.

IDC quantified business enablement improvements. **Table 6** shows significant revenue gains through business enablement, with each organization achieving an average of \$2,233,333 more in revenue. IDC’s financial model applies a 15% operating margin assumption, resulting in net revenue gains of an average of \$335,000 per interviewed organization.

TABLE 6**Business Enablement — Higher Revenue**

	Per Organization	Per Developer
Total additional gross revenue per year	\$2.2M	\$4,039
Assumed operating margin	15%	15%
Total additional net revenue per year — IDC model	\$335,000	\$606

n = 10; IDC Business Value In-Depth Interviews, May 2023

IT Cost Savings Benefits

The final area that IDC examined was the overall cost-effectiveness of the Liberty platform. Cost savings constitutes one of the key benefits of Liberty’s light footprint and translates into reduced spending on infrastructure and application hosting costs. Organizations that use Liberty only pay for containers that applications provision and use as they scale. Moreover, additional cost savings are attributable to the increased density of containers on bare metal infrastructure and the corresponding ability to store more applications on one server. Furthermore, container-native applications tend to have lower start-up times than VM-based applications, leading to additional cost savings for customers.

The study participants elaborated on IT cost-saving benefits:

Hardware cost savings, financial organization:

“The main benefit my organization has achieved with Liberty is cost efficiency. One of the first countries in my organization to move to Liberty and containers was the German branch. They are one of the smallest in my company, and that move saved them around €200,000 a year in hardware and infrastructure costs. So you can see that we spent too much on hardware and infrastructure.”

The ability to run more applications with less infrastructure, healthcare organization:

“From a business perspective, a benefit is the agility and also the financial perspective.

Liberty saves a lot of money for us. We don't want to unnecessarily load all the components to dispense multiple servers to just run a simple application. Liberty is lightweight and brings the flexibility for application and from the infrastructure end, so we run more applications with less workloads."

Cost efficiency from the container-based approach, financial organization:

"The main advantage we found is greater infrastructure efficiency by moving the workloads to Liberty. We have been able to reduce infrastructure by 50%. It was a huge change from traditional servers. We used to have one big server with maybe 250 applications jammed in there. We moved to a container-based approach where each application has its own instance of the server, and they are all independent, and that approach led us to efficiency in infrastructure. Now, we can match the infrastructure to what each application needs, and that led to the reduction. And in this stage of the appropriate architecture, closing into the end of life, the decommissioning of applications is a lot easier."

Significant reduction in cores, healthcare organization:

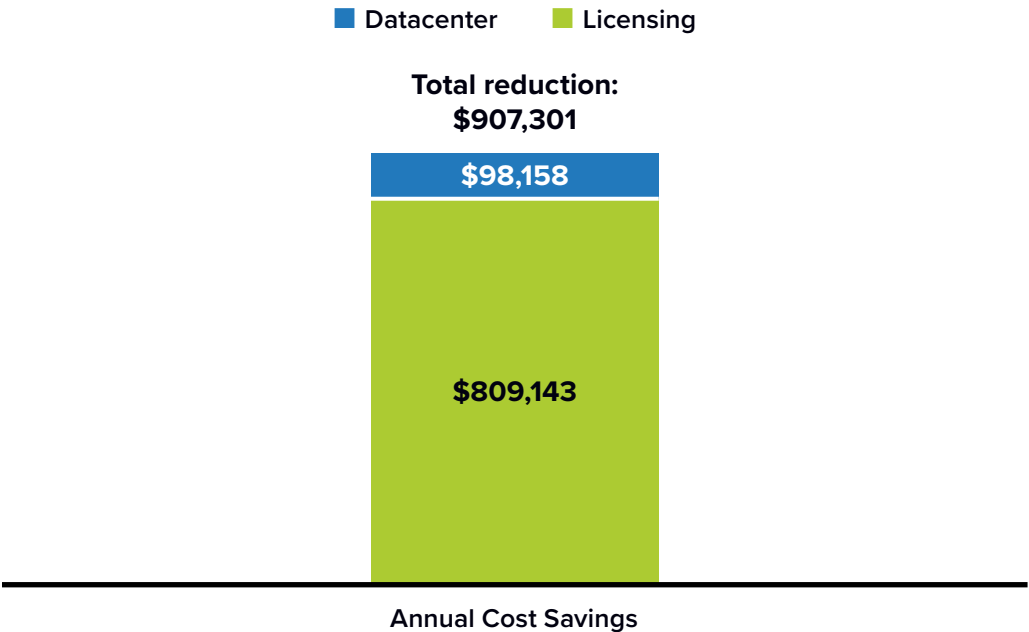
"My company is seeing a significant ability to reduce the number of cores required to run workloads, thanks to Liberty. Specifically, this is quantified at the level of 25%–35% less cores being used to run the same workloads as our previous infrastructure."

Organizations that use Liberty reported significant cost savings derived from reduced licensing and infrastructure-specific costs, such as cores, power and cooling, and colocation expenses. The lightweight architecture of Liberty means that organizations can use fewer cores to run the same workloads compared to other Java application servers.

In addition, Liberty enhances the operational efficiency of infrastructure management due to the increased agility specific to the provisioning and deprovisioning of containers. Due to this operational efficiency, organizations optimize the use of hardware for their fleets of applications. As a result, organizations can run more workloads with fewer infrastructure resources and correspondingly save on infrastructure, licensing, and labor costs.

Figure 6 summarizes IDC’s calculations on cost savings, showing total annual benefits of \$907,301. Note that these calculations include savings due to licensing and core facilities infrastructure.

FIGURE 6
IT Cost Reductions
(\$)



n = 10; IDC Business Value In-Depth Interviews, May 2023

For an accessible version of the data in this figure, see [Figure 6 Supplemental Data](#) in Appendix 2.

ROI Summary

Table 7 (next page) presents IDC’s ROI and analysis of the study participants’ use of Liberty. As shown, IDC projects that these companies will achieve three-year discounted benefits worth an average of \$35,508,800 per organization (\$64,211 per developer) through better application performance, IT staff efficiencies, and improved business performance. These benefits compare with total three-year discounted costs of \$8,289,500 per organization (\$14,990 per developer). These levels of benefits and investment costs are projected to result in an average three-year ROI of 328% and a break-even point in investment occurring in 11.8 months.

TABLE 7
Three-Year ROI Analysis

	Per Organization	Per Developer
Discounted benefits	\$35.5M	\$64,211
Discounted investment	\$8.3M	\$14,990
Net present value (NPV)	\$27.2M	\$49,221
ROI	328%	328%
Payback period	11.8 months	11.8 months
Discount factor	12%	12%

n = 10; IDC Business Value In-Depth Interviews, May 2023

Challenges/Opportunities

Challenges

Perceived Complexity of Kubernetes

One of the challenges specific to the adoption of Liberty is the perception among developers that Kubernetes is a complex technology that requires specialized training. Given the centrality of Kubernetes to cloud-native development, this perception has the potential to deter developers from deepening their competency in cloud-native development and its attendant practices. Moreover, organizations may be predisposed to limit the adoption of cloud-native development due to concerns about the availability of developer and operator talent that have advanced training in Kubernetes.

Opportunities

Prioritization of Accelerated Developer Velocity

Within the contemporary developer landscape, organizations continue to make developer velocity a priority. For developers, this means they must ship code faster without compromising quality and security. Business leaders are increasingly aware of how digitization enables organizations to pivot operations in correlation to rapidly changing business, IT, and regulatory requirements. As a result, organizations are increasingly interested in investing in development platforms that enable accelerated developer velocity and faster time to market.

Intensification of Legacy Application Modernization and Transformation

The push to modernize legacy applications and conduct transformation initiatives are factors for adopting Liberty with its support for microservices and modern development practices such as CI, CD, automated security analytics, and the use of APIs. IDC estimates that 50% of applications within the global application estate should be considered legacy applications and that the share of those applications that have experienced some degree of modernization will increase from 65% in 2022 to 76% in 2024 (IDC Developer View, 2023). These data points underscore the enormity of the universe of legacy applications as well as the depth of investments made with respect to the modernization of these applications. As organizations increase investments in application modernization, the industry should expect increased investment in platforms such as Liberty that support microservices, rapid application development, and the increased integration of automation into development.

Enduring Popularity of Java

IDC data from Developer View 2023 indicates that Java continues to be the world's most popular development language. Of the world's full-time developer population of 17 million developers, approximately 14.5 million developers use Java. Java's enduring versatility across a multitude of development use cases, deployment infrastructures, and form factors renders it relevant both for mission critical, production-grade applications within large enterprises and for more experimental, proof of concept applications specific to both start-ups and their larger counterparts. As organizations deepen their investments in Java, Liberty's lightweight architecture and ability to reduce startup memory consumption while increasing application throughput and reducing latency render it an obvious choice as a development platform, particularly because of its ability to concomitantly increase developer velocity, agility, productivity, and happiness.

Conclusion

Based on IDC's quantitative and qualitative research, organizations realized a multitude of benefits attributed to their use of Liberty. Developer productivity and satisfaction, application performance, innovation, time to market, and security were areas where organizations achieved considerable gains. The improvements organizations have achieved with Liberty translate to annual benefits of \$15.6 million per organization or \$28,000 per developer. Liberty's ability to increase developer productivity and improve application performance while delivering business benefits and cost savings underscores its value and competitive differentiation in the landscape of J2EE application servers. As such, Liberty differentiated itself from other Java application servers because of its ability to improve developer productivity and job satisfaction as well as streamline the use of complex, cutting-edge technologies such as Kubernetes for Java development.

Appendix 1: Methodology

IDC's standard ROI methodology was utilized for this project. This methodology is based on gathering data from current users of Liberty as the foundation for the model.

Based on interviews with organizations using Liberty, IDC performed a three-step process to calculate the ROI and payback period:

1. **Gathered quantitative benefit information during the interviews using a before-and-after assessment of Liberty's impact.** In this study, the benefits included IT cost reductions and avoidances, staff time savings, productivity benefits, and revenue gains.
2. **Created a complete investment (three-year total cost analysis) profile based on the interviews.** Investments go beyond the initial and annual costs of using Liberty and can include additional costs related to migrations, planning, consulting, and staff or user training.
3. **Calculated the ROI and payback period.** IDC conducted a depreciated cash flow analysis of the benefits and investments for the organizations' use of Liberty over a three-year period. ROI is the ratio of the net present value and the discounted investment. The payback period is the point at which cumulative benefits equal the initial investment.

IDC bases the payback period and ROI calculations on several assumptions, which are summarized as follows:

- Time values are multiplied by burdened salary (salary + 28% for benefits and overhead) to quantify efficiency and productivity savings. For the purpose of this analysis, IDC has used assumptions of an average fully loaded salary of \$100,000 per year for IT staff members and an average fully loaded salary of \$70,000 per year for non-IT staff members. IDC assumes that employees work 1,880 hours per year (47 weeks × 40 hours).
- The net present value of the three-year savings is calculated by subtracting the amount that would have been realized by investing the original sum in an instrument yielding a 12% return to allow for the missed opportunity cost. This accounts for both the assumed cost of money and the assumed rate of return.
- Furthermore, because Liberty requires a deployment period, the full benefits of the solution are not available during deployment. To capture this reality, IDC prorates the benefits on a monthly basis and then subtracts the deployment time from the first-year savings.

Note: All numbers in this document may not be exact due to rounding.

Appendix 2: Supplemental Data

The tables in this appendix provide an accessible version of the data for the complex figures in this document. Click “Return to original figure” below the table to get back to the original data figure.

FIGURE 1 SUPPLEMENTAL DATA

Average Annual Benefits Per Organization

	Per Organization
Developer benefits	\$11,795,139
Staff benefits	\$2,435,714
Business productivity benefits	\$712,674
IT cost savings	\$630,070
Total	\$15,573,597

n = 10; IDC Business Value In-Depth Interviews, May 2023

[Return to original figure](#)

FIGURE 3 SUPPLEMENTAL DATA

IBM WebSphere Liberty Impact on Development Activities

	Applications	Features	Updates
Number of new releases per year	40	33	28
Average time to develop	36	45	41

n = 10; IDC Business Value In-Depth Interviews, May 2023

[Return to original figure](#)

Appendix 2: Supplemental Data (continued)

FIGURE 6 SUPPLEMENTAL DATA
IT Cost Reductions

	Annual Cost Savings
Datacenter	\$98,158
Licensing	\$809,143
Total	\$907,301

n = 10; IDC Business Value In-Depth Interviews, May 2023
[Return to original figure](#)

About the IDC Analysts



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Dr. Arnal Dayaratna is research vice president, Software Development at IDC. Arnal focuses on software developer demographics, trends in programming languages and other application development tools, and the intersection of these development environments and the many emerging technologies that are enabling and driving digital transformation. Arnal's research examines how the changing nature of software development relates to broader trends in the technology landscape.

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Megan Szurley is a senior research analyst for the Business Value Strategy Practice, responsible for creating custom business value research that determines the ROI and cost savings for enterprise technology products. Megan's research focuses on the financial and operational impact of these products for organizations once deployed and in production. Prior to joining the Business Value Strategy Practice, Megan was a consulting manager within IDC's Custom Solutions division, delivering consultative support across every stage of the business life cycle: business planning and budgeting, sales and marketing, and performance measurement. In her position, Megan partners with IDC analyst teams to support deliverables that focus on thought leadership, business value, custom analytics, buyer behavior, and content marketing. These customized deliverables are often derived from primary research and yield content marketing, market models, and customer insights.

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