A Forrester Total Economic Impact™ Study

Commissioned By

Oracle

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The Total Economic Impact™ Of Oracle Java Cloud Service

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Executive Summary

Oracle commissioned Forrester Consulting to conduct a Total Economic Impact™ (TEI) study and examine the potential return on investment (ROI) enterprises may realize by deploying Java Cloud Service (JCS). The purpose of this study is to provide readers with a framework to evaluate the potential financial impact of JCS on their organizations.

To better understand the benefits, costs, and risks associated with a Java Cloud Service implementation, Forrester interviewed several customers and their representatives who have multiple years of experience using JCS. As the cloud evolution of WebLogic, JCS provides organizations with the ability to modernize their Java apps, adding flexibility, efficiency, and agility afforded by the cloud.

Oracle Java Cloud Service (JCS) is a part of the platform service offerings in Oracle Cloud. Powered by Oracle WebLogic Server, it provides a platform for developing and deploying new or existing Java EE applications.

"The Java Cloud Service provides us with the opportunity to stay focused on things that matter — which is to develop, rather than, say, training developers to be experts at infrastructure." ~President, Software Development Company

The costs and benefits for a composite organization with 30 Java developers, based on customer interviews, are:

- **Investment costs: $827,384.**
- **Total benefits: $3,360,871.**
- **Net cost savings and benefits: $2,533,488.**

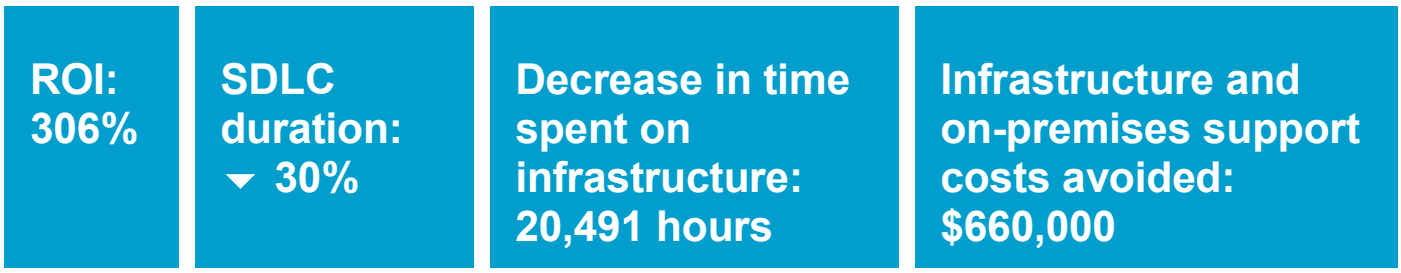
Customers continue to have a multitude of on-premises Java EE applications supporting many aspects of their business. These may include apps that are customer facing, supporting various different business functions like HR, Finance, and applications supporting partners, sales, and more. A steady increase in customers' need to develop, test, and eventually deploy and run their applications on the cloud drove the need for a Java-based Platform-as-a-Service (PaaS) offering. With Java Cloud Service, customers are able to streamline their software development lifecycle (SDLC) with improved developer productivity and quickened delivery of applications, enabling them to deliver against their business imperatives.

ORACLE JCS SIMPLFIES THE DEVELOPMENT ENVIRONMENT

Our interviews with two existing customers and subsequent financial analysis found that a composite organization based on the organizations that we interviewed experienced the risk-adjusted ROI and benefits shown in Figure 1.[1]

The composite organization analysis points to benefits of $1,120,290 per year versus investment costs of $275,794, adding up to a net present value (NPV) of $2,533,488 over three years. With Java Cloud Service, developers gained valuable time with near instant development instances and were finally able to provide continuous delivery with applications and functionality for the organization.

FIGURE 1
Financial Summary Showing Three-Year Risk-Adjusted Results



Source: Forrester Research, Inc.

› **Benefits.** The composite organization experienced the following risk-adjusted benefits that represent those experienced by the interviewed companies:

- **Reduced developer time wasted on waiting for infrastructure by 12,960 hours, or a three-year present value of over $684,879.** On average, developers developing and maintaining apps on-premises spend 15% of their time waiting on infrastructure provisioning. The Oracle JCS platform-as-a-service (PaaS) nearly eliminated all wait time for the developers that had previously relied on IT for provisioning their development and test environments. Prior to JCS, some developers had even taken it upon themselves to perform infrastructure operations duties when IT operations was slow to stand up development environments. Following the JCS adoption, developers are empowered to work as intended, developing apps and services, with minimal downtime waiting for infrastructure.
- **A yearly savings of 1,440 hours for IT operations personnel that was previously spent on provisioning development environments.** The ad hoc nature of development, unpredictability of hardware, and variable nature of resource availability often required IT operations team or network administrators to spend extended periods of time to prepare infrastructure and bring up instances. With an always-on self-service model with the Java Cloud Service, the application development platform was available when needed, greatly reducing the workload of IT operations. Savings realized by the IT operators were $179,053, PV over three years.
- **Shortened project and product time-to-market by reducing SDLC by 30% with improved developer allocation.** With the reduction in infrastructure-related tasks for the developers, the organization gained clarity over its developers' relative strengths and weaknesses, and thus was able to allocate developers to projects where their expertise will be most utilized. By better leveraging the appropriate developer workforce to a prioritized list of projects, the organization was able to reduce overall development and deployment cycles by 30% and push applications to market significantly sooner than otherwise. The improved time-to-market resulted in an added value of over $1.8 million over three years.
- **Avoided refresh cycle purchase of infrastructure, license support, and associated maintenance, amounting to $659,852 over three years and delivered through both CAPEX and OPEX avoidance.** The composite organization chose to update its on-premises WebLogic infrastructure required to meet increasing usage requirements. By using the JCS platform, everything was moved to the cloud and the organization was able to avoid additional CAPEX associated with traditional refreshes as well as the OPEX to maintain, support, and patch the on-premises infrastructure.

› **Costs.** The composite organization experienced the following risk-adjusted costs:

- **Java Cloud Service subscription fees.** These are ongoing PaaS fees for access to the solution software and the usage of cloud infrastructure on a metered basis. Total three-year usage costs amounted to $659,384 in PV.
- **Java Cloud Service migration and training costs.** This is a one-time fee for professional services to ensure successful on-boarding and training on the new JCS platform. As the new platform is very similar to the existing WebLogic interface, minimal change management is required and minimal costs incurred in the initial adoption period. Total cost incurred in the initial year of adoption was $168,000.

Disclosures

The reader should be aware of the following:

- The study is commissioned by Oracle and delivered by Forrester Consulting. It is not meant to be used as a competitive analysis.
- Forrester makes no assumptions as to the potential ROI that other organizations will receive. Forrester strongly advises that readers use their own estimates within the framework provided in the report to determine the appropriateness of an investment in Oracle/Java Cloud Service.
- Oracle reviewed and provided feedback to Forrester, but Forrester maintains editorial control over the study and its findings and does not accept changes to the study that contradict Forrester's findings or obscure the meaning of the study.
- Oracle provided the customer names for the interviews but did not participate in the interviews.

TEI Framework and Methodology

INTRODUCTION

From the information provided in the interviews, Forrester has constructed a Total Economic Impact (TEI) framework for those organizations considering implementing Oracle Java Cloud Service. The objective of the framework is to identify the cost, benefit, flexibility, and risk factors that affect their investment decision, to help organizations understand how to take advantage of specific benefits offered by JCS, reduce costs, and achieve their overall business goals of winning, serving, and retaining customers.

APPROACH AND METHODOLOGY

Forrester took a multistep approach to evaluate the impact that Java Cloud Service can have on an organization (see Figure 2). Specifically, we:

- Interviewed Oracle marketing, sales, and/or consulting personnel, along with Forrester analysts, to gather data relative to Java Cloud Service and the marketplace for Java Cloud Service.
- Interviewed two organizations currently using Oracle Java Cloud Service to obtain data with respect to costs, benefits, and risks pre and post usage of Java Cloud Service.
- Designed a composite organization based on characteristics of the interviewed organizations and anticipated profiles of customers.
- Constructed a financial model representative of the interviews using the TEI methodology. The financial model is populated with the cost and benefit data obtained from the interviews as applied to the composite organization.
- Risk-adjusted the financial model based on issues and concerns the interviewed organizations highlighted. Risk adjustment is a key part of the TEI methodology. While interviewed organizations provided cost and benefit estimates, some categories included a broad range of responses or had a number of outside forces that might have affected the results. For that reason, some cost and benefit totals have been risk-adjusted and are detailed in each relevant section.

Forrester employed four fundamental elements of TEI in modeling Oracle Java Cloud Service: benefits, costs, flexibility, and risks.

Given the increasing sophistication that enterprises have regarding ROI analyses related to IT investments, Forrester's TEI methodology serves to provide a complete picture of the total economic impact of purchase decisions. Please see Appendix A for additional information on the TEI methodology.

FIGURE 2
TEI Approach

Source: Forrester Research, Inc.

Analysis

INTERVIEW HIGHLIGHTS

For this study, Forrester conducted multiple interviews with representatives from companies that have extensively used both Oracle WebLogic Server on-premises and the Oracle JCS platform. The extent of our interviews involved the exploration and analysis of how the various solutions performed in existing/before state (on WebLogic), as well as after implementing JCS. Characteristics of the organizations interviewed are as follows:

- **A large multinational technology advisory firm with annual revenues in the billions.** This organization leverages Oracle JCS to produce and host applications for internal usage as well as for external client usage. It currently employs hundreds of developers who are dedicated to Java development. The variety and sheer volume of Java development projects that this organization is involved in requires that it has enormous flexibility and scalability.
- **A US-based software company specializing in software development and deployment, with a focus on services around Oracle technologies.** The organization's core ability is to assist organizations in accelerating their software delivery and to enable a continuous delivery model. Its current development staff consists of 20-plus developers who are regularly confronted with the challenge of building, delivering, and testing Java software in a cost-, resource-, and time-optimized manner.

"We need to plug into multiple cloud services, including Amazon, Azure, and Oracle, as well as various on-premises technologies. Without the delivery efficiencies of JCS, we would have an army of people running around here just managing infrastructure."

~ President, Software Development Company

THE COMPOSITE ORGANIZATION

Based on the interviews and internal research, Forrester constructed a TEI framework, a composite company, and an associated ROI analysis that illustrates the areas financially affected. The composite organization that Forrester synthesized from these results represents an organization with the following characteristics:

- The US-based consumer goods online retailer has 6,000 employees. It has a global presence selling goods across the North American, EMEA, and Asia Pacific regions.
- It has annual revenues of over $2 billion.
- This company has a need for numerous Java-based, internally facing applications for its internal day-to-day operational processes.
- Of the applications on the priority list, two major projects need to be developed and deployed, requiring a significant allocation of development, infrastructure, and operational resources.
- It has a development team of over 15 developers dedicated to advancing and maintaining the organization's application platforms.
- The organization's IT operations staff is a shared resource that manages, maintains, and provisions infrastructure software and hardware for the development team.

- The retailer is encountering tremendous growth, which will be accompanied by the need for both major and smaller, less complex Java-based projects.
- The company's current data repositories include major Oracle databases and ERP. On-premises WebLogic Server facilitates Java development and deployment through its two data centers.
- Its current two data centers are distributed, with one in North America and the other in Asia Pacific. The two data centers both contain infrastructure to distribute development workloads to maximize utilize of developer resources.

> *"When we have software engineers running around fixing disk failures or other infrastructure plumbing to stand up development instances, that is just a complete waste of time."*
>
> ~ President, Software Development Company

SITUATION

The composite organization runs a gamut of applications that are both internal and external facing. Many of these apps access data from existing Oracle data repositories. Data is currently held on-premises between the two data centers, with a mindset shift toward serving the data and applications alike on cloud platforms, due to the cost and flexibility advantages offered by scalable public clouds. With a number of large-scale and smaller development projects in the pipeline, the organization realizes the need to optimize its development and runtime platforms.

The provisioning of development environments was often a time consuming task. Developers requested specific app server and database instances resulting in a fair amount of back and forth communications with IT operations to provision the proper environment. A shortage of IT staff and high variability in availability of hardware and software resources like servers, storage, and software licenses resulted in even worse scenarios where developers attempt to handle IT operations duties to provision their own environments. Infrastructure provisioning became a bottleneck to the progression of development efforts. One proposed solution was to more closely integrate the development and IT operations efforts. A further improvement would be to enable a self-service model to almost instantly respond to the needs of development and test instances.

To address the inefficiencies of its existing processes, the organization sought to meet the following requirements:

- Faster speed to provision new environments, which was critical, as the organization often spent days, weeks, sometimes even months waiting for development environments.
- Instant scalability when required, with self-service capability so that development teams could structure environments on the fly as necessary.
- Reduction of IT resources, which was crucial, as the organization was rationalizing and consolidating its on-premises environment. An overall operations expenditure reduction to maintain infrastructure, including patching, updating, and introducing functionality rollout was also desired.
- Ease of integration with existing Oracle databases, so that applications running on the new framework would have access to necessary data.
- Contain CAPEX for infrastructure hardware and software refreshes within the growing organization and better manage utilization rates of existing hardware resources.

SOLUTION

The consumer goods composite organization chose to evaluate Oracle's JCS platform. The organization believed the new cloud platform would not only be a natural evolution from the existing on-premises deployments of WebLogic, but also that it would be a more efficient way to drive new development projects without expending significant CAPEX. Given the extensive

infrastructure that was already in place, but requiring a refresh, the organization chose to deploy and migrate to the JCS platform which offered increased agility to its developers and overall IT efficiency.

RESULTS

With Oracle Java Cloud Service, the organization was able to recognize the true value of its developers by releasing them of the burden of managing infrastructure. JCS instances, be it for development, test, or debugging, were provisioned with minimal effort, by developers. This allowed developers to focus on what they were originally intended to do, which is to create business value through development. The solution demonstrated that it was capable of delivering nearly "hands off" availability. Instances became regularly available within 15 minutes, leading to significant boost to developer productivity. Business outcomes that resulted are as follows:

- **Significantly improved developer output.** Operational duties decreased while development efforts improved. The equation of time spent on developing versus attending to infrastructure needs shifted heavily and, as a result, yielded greater development output. Development teams were able to drive self-service provisioning and create the exact environments that were needed, much more quickly and with fewer steps. Output was increased through a few key drivers: fewer correct environment/instance provisioning attempts and interactions with IT operations, faster provisioning, and improved utilization of developers through visibility into their skillsets and abilities (e.g. a great backend Java developer vs. UI expert vs. developer gifted in scripting languages).
- **A seamless move from WebLogic on-premises to JCS, and shortly after, a reduction in resource requirements in the company's data centers.** The composite organization's developers were able to move existing applications with data dependencies easily to the cloud due to the same WebLogic Server capabilities and connectors being provided on Oracle JCS. As the organization moved more of its apps onto the JCS platform, the management of the infrastructure became simpler, with a lighter on-premises footprint.
- **Scaling to match environment requirements, without increasing provisioning times or CAPEX expenditure.** Between massive development project undertakings and smaller projects, it was evident for the composite organization that forecasting the right amount of infrastructure will pose a challenge. In its existing state, significant capital expenditure was necessary to be able to accommodate the growing production environment and the unpredictability in the size of development and test environments. With JCS, provisioning and scaling up for compute heavy instances was easily handled, while scaling out to increase total nodes removed the need for requisition of new infrastructure and untimely IT headcount.

> *"**There's more to it than just the ROI from JCS**. We're talking about the processes, the finances, and the revenue aspects in the rest of the company that's affected as a result of developing on the Oracle Cloud. Entire business models can be revolutionized because of this."*
>
> ~ Senior director, technology advisory firm

BENEFITS

The composite organization experienced the following quantified benefits in this case study:

- Savings from reduced developer resources wasted on waiting for infrastructure.
- Labor cost saved by IT operations to provision development environments
- Improved Time-to-Market and Effort Reduction With Optimized Developer Allocation
- Avoided refresh cycle purchase of infrastructure and associated maintenance.

Other important benefits mentioned by the composite organization are the additional functionality and capabilities produced by the quicker Java development. Increased business benefits are ultimately gained in such areas as higher revenue and end user productivity gains following the more expeditious delivery of applications. While these gains are significant, we chose not to include them in our analysis due to the extreme variability in the type of projects and also the margins related to specific verticals that organizations operate in.

Savings from Reduced Developer Resources Wasted On Infrastructure Operations-Related Tasks

The composite organization indicated that a key benefit from the Java Cloud Service implementation was a significant decrease in wasted developer resources previously spent waiting on infrastructural and network operations-related tasks. Following the introduction of JCS, the composite organization was able to mitigate the 15% infrastructure related tasks that developers were faced with and recapture that time to be used for pure development.

Commonly in the on-premises environment, developers would wait for IT operations, especially to provision complex development environments with multiple app server and database instances, multiple servers etc. At other times, developers would need to wait for the requested resources to become available. In all, a significant portion of the developers' days were not being utilized for development work.

Assuming 15 developers are employed by the composite organization, the annual loss per year due to waiting for NOC/infrastructure-related issues amounted to 4,320 hours of developer time, translating into an annual dollar figure of $324,000. Following three years, the expected return on this benefit is $805,740, in present value.

In all, increased developer productivity came in three forms:

- The ability for developers to wait on *fewer attempts* to stand up the necessary instances, due to either problematic hardware or infrastructure resource allocation constraints.
- The ability for developers to be up and running more quickly with *each of the instances ready in as little as 15 minutes.*
- The ability for developers to *perform self-service* and minimize dependency on IT operations for environement provisioning. .

We realize that not all free time is captured, as it is also commonly used for coffee breaks or office chitchat. Therefore, our analysis includes a downward adjustment to the value of this benefit category by 15%. The risk-adjusted present value is $684,879 over three years.

TABLE 1
Savings from Reduced Developer Resources Wasted On Waiting for Infrastructure

Ref.	Metric	Calculation	Initial	Year 1	Year 2	Year 3
A1	Number of Java developers		15	15	15	15
A2	Total Java developer hours available to the organization	A1*1920 hours/year		28,800	28,800	28,800
A3	Hourly rate for Java developer, fully loaded		$75	$75	$75	$75
A4	Annual cost of developers to organization			$2,160,000	$2,160,000	$2,160,000
A5	Average amount of time wasted by developers waiting for infrastructure			15%	15%	15%
At	Savings from reduced developer resource waste on waiting for infrastructure	A4*A5	$0	$324,000	$324,000	$324,000
	Risk adjustment	↓15%				
Atr	**Savings from reduced developer resource waste on waiting for infrastructure (risk-adjusted)**		**$0**	**$275,400**	**$275,400**	**$275,400**

Source: Forrester Research, Inc.

Labor Cost Saved by IT Operations to Provision Development Environments

In the on-premises model, developers relied heavily upon IT operations to provision dev-test resources. This in itself was a slow process, often mired with wait times for the proper resources to become available and at other times, complicated due to back and forth communications exchanges between the development team and IT. Spread across the enterprise, 6 hours were spent per day by IT operations.

With the use of Oracle JCS, developers are able to use a self-service model to provision their own instances, creating environments catered to their requirements, without any errors. Asynchronous email transmissions back and forth to IT were also avoided. Provisioning was no longer a necessary task for IT personnel. With the time saved by the IT personnel, these operations full-time equivalents (FTEs) were free to provide value in other areas of the organization. The decreased usage of IT operations amounted to a three-year value of $179,053.

TABLE 2
Labor Cost Saved By IT Operations to Stand Up Development Environments

Ref.	Metric	Calculation	Initial	Year 1	Year 2	Year 3
B1	Hours spent by IT Ops group to stand up development instances, per day			6	6	6
B2	Days per year requiring new development environments			240	240	240
B3	Hourly rate for IT Operations FTE, fully loaded			$50	$50	$50
Bt	Labor cost saved by IT Operations to stand up development environments	B1*B2*B3	$0	$72,000	$72,000	$72,000
	Risk adjustment	0%				
Btr	**Labor cost saved by IT Operations to stand up development environments (risk-adjusted)**		**$0**	**$72,000**	**$72,000**	**$72,000**

Source: Forrester Research, Inc.

Improved Time-to-Market and Effort Reduction with Optimized Developer Allocation

Our interviews revealed that all the organizations (inclusive of the interviewed organizations and their client organizations) that have made the switch to JCS have been able to gain greater clarity on the skill sets of their developers, whereas developer roles previously were mired with infrastructure- and administration-related tasks. The net effect is an increased visibility into the coding strengths and areas of focus of the development team members and quicker completion of priority projects. Some were a clear fit for Java development, while others were better suited to different programming frameworks. The composite organization was thus able to more effectively allocate star developers to the projects with higher priority. Developers who weren't as capable in Java development were rotated into other areas. In essence, the developer team that remained on the JCS platform included rockstar developers who produced results 30% quicker than the existing project teams. Combining this 30% efficiency with the 15% time gain from reducing operations work and time wasted waiting for the provisioning of dev-test environments, resulted in an overall reduction in SDLC by 45%.

The composite organization experienced time value gains resulting from the faster rollout of new services and functionality. Transformational projects very often affect major components and levers of business models, resulting in significant efficiency gains or greater revenues across the enterprise. Conservatively, we've limited the IRR expectations from the organizations to 20% IRR for Java-related development projects. Using this rate of IRR and multiplying it by the number of hours that the projects were shortened by, we found that the composite organization is expected to gain a benefit of $1,933,776 over three years, PV adjusted.

"Truthfully, we're seeing a 50% improvement in development efficiency, just because we can now tell who is actually really proficient as a developer."

~ Senior Director, Technology Advisory Firm

Different organizations set different levels of IRR as a determinant for project green-lighting. While the composite organization saved 30% of hours on its SDLCs, we have risk-adjusted the IRR rate down by 5% to account for organizations that undertake projects with an IRR lower than 20%. As a result, the risk-adjusted three-year PV benefit is $1,837,087. See the section on Risks for more detail.

TABLE 3
Improved Time-to-Market and Effort Reduction With Optimized Developer Allocation

Ref.	Metric	Calculation	Initial	Year 1	Year 2	Year 3
C1	Total development hours used by organization			28,800	28,800	28,800
C2	Improved developer resource allocation, leading to quicker development cycles, shown as a percentage reduction in time			30%	30%	30%
C3	Developer hours saved	C1*C2		8,640	8,640	8,640
C4	Developer costs saved	$75*C3		$648,000	$648,000	$648,000
C5	Organizational expectations for minimum project IRR			20%	20%	20%
Ct	Improved time-to-market and effort reduction with optimized developer allocation	C4*(1+C5)	$0	$777,600	$777,600	$777,600
	Risk adjustment	↓5%				
Ctr	**Improved time-to-market and effort reduction with optimized developer allocation (risk-adjusted)**		**$0**	**$738,720**	**$738,720**	**$738,720**

Source: Forrester Research, Inc.

Avoided Refresh Cycle Purchase of Infrastructure and Associated Maintenance

For many organizations, including that of the composite organization, technology refresh cycles occur typically every three years. At this refresh point, the composite organization chose to migrate to the more scalable JCS platform rather than upgrading its traditional on-premises infrastructure. In moving to the cloud for its Java development platform, the organization was able to avoid purchasing the following:

- Physical servers and the buildout of infrastructure necessary for the servers
- Ongoing maintenance of the infrastructure, lasting through the entire refresh cycle
- Ongoing on-premises WebLogic Server software support

The total avoided costs of hardware, support functions, and support contracts amounted to $659,852 over three years, in PV terms.

TABLE 4
Avoided Refresh Cycle Purchase Of Infrastructure And Associated Maintenance

Ref.	Metric	Calculation	Initial	Year 1	Year 2	Year 3
D1	Cost of physical servers and data center footprint		$90,000			
D2	IT FTE deployment, maintenance, and support for servers and WebLogic, in hours		1,339	624	624	624
D3	Hourly cost of IT FTE, fully loaded		$50	$50	$50	$50
D4	Cost of IT FTE maintenance and support for servers and WebLogic	D2*D3	$66,931	$31,200	$31,200	$31,200
D5	WebLogic Server EE software support fees avoided		$165,000		$165,000	$165,000
Dt	Avoided refresh cycle purchase of infrastructure and associated maintenance	D1+D4+D5	$321,931	$31,200	$196,200	$196,200
	Risk adjustment	0%				
Dtr	**Avoided refresh cycle purchase of infrastructure and associated maintenance (risk-adjusted)**		**$321,931**	**$31,200**	**$196,200**	**$196,200**

Source: Forrester Research, Inc.

Total Benefits

Table 5 shows the total of all benefits across the three areas listed above, as well as present values (PVs) discounted at 10%. Over three years, the composite organization expects risk-adjusted total benefits to be a PV of more than $3.3 million.

TABLE 5
Total Benefits (Risk-Adjusted)

Ref.	Benefit Category	Initial	Year 1	Year 2	Year 3	Total	Present Value
Atr	Savings from reduced developer resources wasted on waiting for infrastructure	$0	$275,400	$275,400	$275,400	$826,200	$684,879
Btr	Labor cost saved by IT Operations to stand up development environments	$0	$72,000	$72,000	$72,000	$216,000	$179,053
Ctr	Improved Time-to-Market and Effort Reduction With Optimized Developer Allocation	$0	$738,720	$738,720	$738,720	$2,216,160	$1,837,087
Dtr	Avoided refresh cycle purchase of infrastructure and associated maintenance	$321,931	$31,200	$196,200	$196,200	$745,531	$659,852
	Total benefits (risk-adjusted)	**$321,931**	**$1,117,320**	**$1,282,320**	**$1,282,320**	**$4,003,891**	**$3,360,871**

Source: Forrester Research, Inc.

COSTS

The composite organization experienced costs in two major categories that are associated with the Java Cloud Service solution:

› Java Cloud Service subscription costs

› Java Cloud Service migration and training costs

These represent the mix of internal and external costs experienced by the composite organization for initial planning, implementation, and ongoing maintenance associated with the solution. Attention should be paid to the fact that the composite organization is transitioning from an existing WebLogic on-premises development platform. For organizations migrating from different platforms, the costs to train, migrate, and implement could be variably higher.

Java Cloud Service Subscription Costs

A primary benefit of the JCS offering is the ability to scale at will, where complex large-scale projects can be developed using just the right amount of processing power, without having to overpay for extra infrastructure that would later go unused. In anticipation of the variance in the larger initiatives during its first year of JCS use, the composite organization used a metered pay-as-you-go plan, for a Year 1 cost of $523,469. In the second and third years of using JCS, when major transformational initiatives had already been complete, the organization was able to scale computing environments and resources to match its needs and hence reduce costs to $116,306 each year. In the years 2 and 3, development projects were generally smaller in scope and demanded fewer infrastructure resources. Over a three-year span, the composite organization incurred JCS costs of $659,384 in PV.

Software costs vary from organization to organization and region to region, depending on the specific configuration demands. As such, the pricing represented here is compiled from readily published list pricing. Readers are encouraged to discuss pricing with Oracle or an Oracle Partner to explore discounting, as this is standard practice for large enterprise-level engagements and pre-negotiated purchase agreements.

TABLE 6
Java Cloud Service Subscription Costs

Ref.	Metric	Calculation	Initial	Year 1	Year 2	Year 3
E1	Metered JCS EE yearly cost, based on usage for year for larger transformational projects			$523,469		
E2	Metered JCS EE yearly cost, for smaller project initiatives				$116,306	$116,306
Etr	**Java Cloud Service subscriptions costs (risk-adjusted)**	**E1+E2**	**$0**	**$523,469**	**$116,306**	**$116,306**

Source: Forrester Research, Inc.

Java Cloud Service Migration and Training Costs

Organizations are typically concerned with the direct and ancillary costs of moving application development stacks to new tools — and rightfully so. There is a high chance of code breaking, requiring a significant amount of time to remediate. Because Oracle runs the exact same WebLogic Server software in JCS that is run by many organizations on-premises, the risks and costs of migration to JCS can be largely mitigated.

With very little work commonly associated with migration tasks such as debugging and testing, the composite organization incurred a single initial professional services fee of $150,000 to oversee migration and introduce best practices for continued success. Internal developers were each involved in 8 hours of training to gain familiarity with the interface, resulting in an initial cost to the company of $18,000 in developer time. Total costs incurred for the migration and training were $168,000.

"Envision this — we literally just move our application files over to JCS and it works. We take the same EAR file from WebLogic and start it up in JCS. That's it. The same files that were running on-premises are now running in the cloud."

~ President, Software Development Company

TABLE 7
Java Cloud Service Migration And Training Costs

Ref.	Metric	Calculation	Initial	Year 1	Year 2	Year 3
F1	Oracle professional services for Java EE application migration from on-premises deployments		$150,000			
F2	Internal training, hours per developer		8			
F3	Number of Java developers, enterprise wide		30			
F4	Cost of Java developer, per hour, fully loaded		$75			
Ft	Java Cloud Service migration and training costs	F1+(F2*F3*F4)	$168,000	$0	$0	$0
	Risk adjustment	0%				
Ftr	**Java Cloud Service migration and training costs (risk-adjusted)**		**$168,000**	**$0**	**$0**	**$0**

Source: Forrester Research, Inc.

Total Costs

Table 8 shows the total of all costs as well as associated present values (PVs), discounted at 10%. Over three years, the composite organization expects total costs to be a PV of $827,384.

TABLE 8
Total Costs (Risk-Adjusted)

Ref.	Cost Category	Initial	Year 1	Year 2	Year 3	Total	Present Value
Etr	Java Cloud Service subscriptions costs	$0	($523,469)	($116,306)	($116,306)	($756,081)	($659,384)
Ftr	Java Cloud Service migration and training costs	($168,000)	$0	$0	$0	($168,000)	($168,000)
	Total costs (risk-adjusted)	**($168,000)**	**($523,469)**	**($116,306)**	**($116,306)**	**($924,081)**	**($827,384)**

Source: Forrester Research, Inc.

FLEXIBILITY AND AGILITY

Flexibility, as defined by TEI, represents an investment in additional capacity or capability that could be turned into business benefit for some future additional investment. This provides an organization with the “right” or the ability to engage in future initiatives but not the obligation to do so. There are multiple scenarios in which a customer might choose to implement Java Cloud Service and later realize additional uses and business opportunities. Flexibility would also be quantified when evaluated as part of a specific project (described in more detail in Appendix A).

Most readers and potential adopters of the Oracle JCS platform are aware of the benefits of being agile and paying only for the services that you truly need. Our findings from interviews with the JCS customers revealed that many organizations often have not implemented proper on-premises infrastructure to deliver transformational projects. Choosing and implementing a new infrastructure is a multistep process that includes identification of the business requirements, necessary components, vendor selection, and data center buildouts. By the time the procurement is done, months have passed and the organization would have missed the opportunity to leverage the outputs of the transformation project. Oracle JCS doesn’t just save developers and IT professionals’ time — it creates benefits sooner by eliminating requisition as well as operational hurdles. That is the true flexibility and agility provided by JCS.

RISKS

Forrester defines two types of risk associated with this analysis: “implementation risk” and “impact risk.” Implementation risk is the risk that a proposed investment in Java Cloud Service may deviate from the original or expected requirements, resulting in higher costs than anticipated. Impact risk refers to the risk that the business or technology needs of the organization may not be met by the investment in Java Cloud Service, resulting in lower overall total benefits. The greater the uncertainty, the wider the potential range of outcomes for cost and benefit estimates.

TABLE 9
Benefit and Cost Risk Adjustments

Benefits	Adjustment
Savings from reduced developer resource waste on infrastructure operations related tasks	↓ 15%
SDLC time and effort reduction through improved developer allocation	↓ 5%
Costs	**Adjustment**
Java Cloud Service subscription costs	N/A

Source: Forrester Research, Inc.

Quantitatively capturing implementation risk and impact risk by directly adjusting the financial estimates results provides more meaningful and accurate estimates and a more accurate projection of the ROI. In general, risks affect costs by raising the original estimates and affect benefits by reducing the original estimates. The risk-adjusted numbers should be taken as "realistic" expectations since they represent the expected values considering risk.

The following impact risks that affect benefits are identified as part of the analysis:

- Savings from reduced developer resources wasted on infrastructure operations-related tasks free up hours for developers to use on developing and deploying code. The unfortunate reality is that not all free time restored is used in a productive manner, such as intra-office chitchat or coffee breaks. As such, we have reduced the benefit found in this category by 15% based upon prior research on the actual productivity capture.
- SDLC time and effort reduction through improved developer allocation is subject to the risk of organizations using a lower IRR as a determinant to start a project and hence reduce the actual value of the developers' speed improvements. Additionally, star developers who are extreme apt at coding are often able to work in faster iterations than business-level stakeholders, resulting in pauses during development runs. The combination of a lower IRR barrier and the possibility of business stakeholder slowdowns led to us reducing the benefit of this category by 5% as a risk adjustment.

The following implementation risk that affects costs is identified as part of this analysis:

- Our analyses on the metered and unmetered costs of JCS are based on list pricing and the needs of the composite organization. There will be the possibility of either lower price through negotiations — thus reducing risk — or an increase in price due to the need for more connectors to highly complex application and database stacks. As the pricing risk can be affected in both directions, we encourage readers to contact Oracle and determine pricing fixtures that would be catered to your specific situation.

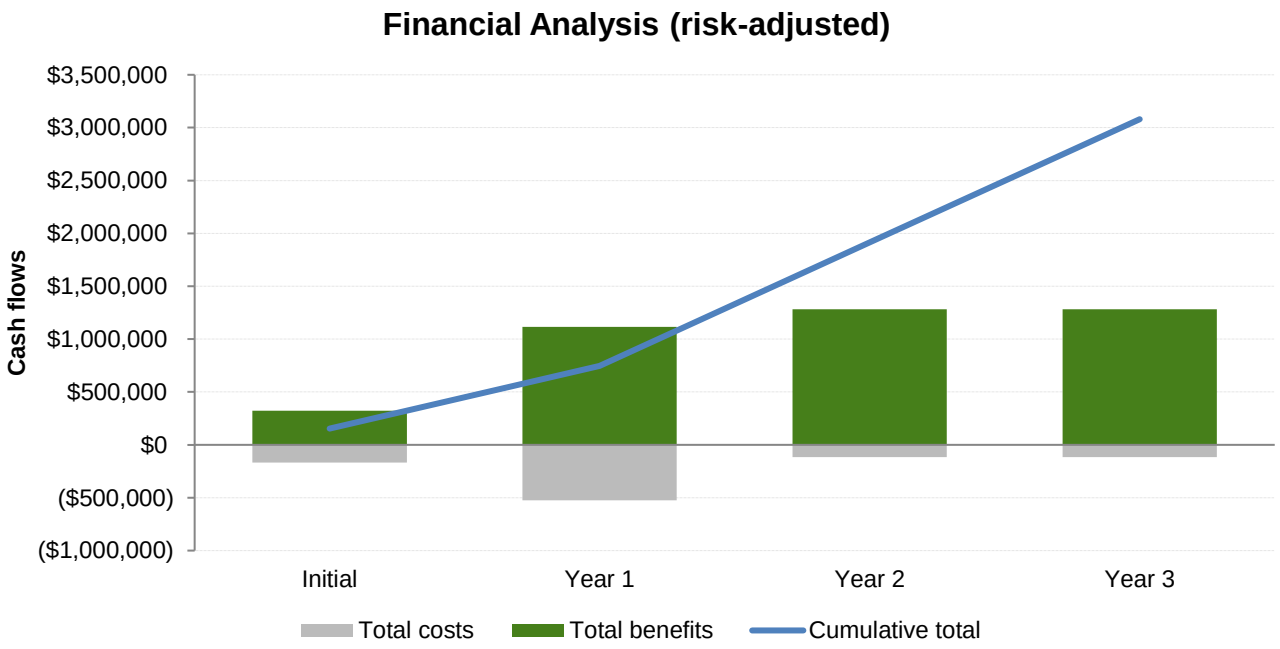
Table 9 shows the values used to adjust for risk and uncertainty in the cost and benefit estimates for the composite organization. Readers are urged to apply their own risk ranges based on their own degree of confidence in the cost and benefit estimates.

Financial Summary

The financial results calculated in the Benefits and Costs sections can be used to determine the ROI, NPV, and payback period for the composite organization's investment in Java Cloud Service.

Table 10 below shows the risk-adjusted ROI, NPV, and payback period values. These values are determined by applying the risk-adjustment values from Table 9 in the Risks section to the unadjusted results in each relevant cost and benefit section.

FIGURE 3
Cash Flow Chart (Risk-Adjusted)



Source: Forrester Research, Inc.

TABLE 10
Cash Flow (Risk-Adjusted)

	Initial	Year 1	Year 2	Year 3	Total	Present Value
Costs	($168,000)	($523,469)	($116,306)	($116,306)	($924,081)	($827,384)
Benefits	$321,931	$1,117,320	$1,282,320	$1,282,320	$4,003,891	$3,360,871
Net benefits	**$153,931**	**$593,851**	**$1,166,014**	**$1,166,014**	**$3,079,811**	**$2,533,488**
ROI						**306%**
Payback period						**< 6 months**

Source: Forrester Research, Inc.

Oracle Java Cloud Service: Overview

Oracle Java Cloud Service is a complete enterprise grade platform and for building, deploying, and managing Java EE applications. Customers use Oracle Java Cloud Service to rapidly provision an application environment with Oracle WebLogic Server as the application container and Oracle Traffic Director as the software load balancer, on top of infrastructure provided by Oracle Compute Cloud Service. Businesses can maximize productivity with instant access to cloud environments that support any Java EE application complete with integrated security, management, and database access. It allows businesses to realize all the benefits of Platform as a Service including subscription-based, self-service access to reliable, scalable, and elastic cloud environments. Additionally, businesses can move their applications seamlessly from the Oracle Cloud to on-premises and back again.

FEATURES

- Self-service portal to provision your environment in minutes, and immediately start deploying your application
- Full automated life cycle management using advanced tooling
- Powered by the industry's #1 application server Oracle WebLogic Server
- Runs on Oracle's enterprise-grade compute infrastructure
- Fully customizable for any Java application, with full administrative access
- Standards-based platform for easy deployment of new or existing Java applications
- Built-in High Availability and dynamic scale out/in/up/down to meet changing demand
- Designed to handle any workloads for enterprises to startups
- RESTful APIs for automation
- Support for developer productivity tools such as Maven, Ant, Eclipse, NetBeans, and JDeveloper
- DevOps-ready through integration with Developer Cloud Service
- "AppToCloud" feature to lift and shift your on-premises applications to cloud

BENEFITS

- Massive developer and administrator productivity with self-service, agile platform
- Rapid development, focus on business problem, and innovation
- Reduce cost with pay per use and instant reporting of usage
- Zero code change to move applications to cloud
- Significant capacity available at your fingertips, any-time without upfront commitment
- Quick time to market with instant provisioning of environment and highly productive developer tools
- Reduces risk with standards-based platform, with no vendor lock-in
- Always-on business with highly available platform

Appendix A: Total Economic Impact™ Overview

Total Economic Impact is a methodology developed by Forrester Research that enhances a company's technology decision-making processes and assists vendors in communicating the value proposition of their products and services to clients. The TEI methodology helps companies demonstrate, justify, and realize the tangible value of IT initiatives to both senior management and other key business stakeholders. TEI assists technology vendors in winning, serving, and retaining customers.

The TEI methodology consists of four components to evaluate investment value: benefits, costs, flexibility, and risks.

BENEFITS

Benefits represent the value delivered to the user organization — IT and/or business units — by the proposed product or project. Often, product or project justification exercises focus just on IT cost and cost reduction, leaving little room to analyze the effect of the technology on the entire organization. The TEI methodology and the resulting financial model place equal weight on the measure of benefits and the measure of costs, allowing for a full examination of the effect of the technology on the entire organization. Calculation of benefit estimates involves a clear dialogue with the user organization to understand the specific value that is created. In addition, Forrester also requires that there be a clear line of accountability established between the measurement and justification of benefit estimates after the project has been completed. This ensures that benefit estimates tie back directly to the bottom line.

COSTS

Costs represent the investment necessary to capture the value, or benefits, of the proposed project. IT or the business units may incur costs in the form of fully burdened labor, subcontractors, or materials. Costs consider all the investments and expenses necessary to deliver the proposed value. In addition, the cost category within TEI captures any incremental costs over the existing environment for ongoing costs associated with the solution. All costs must be tied to the benefits that are created.

FLEXIBILITY

Within the TEI methodology, direct benefits represent one part of the investment value. While direct benefits can typically be the primary way to justify a project, Forrester believes that organizations should be able to measure the strategic value of an investment. Flexibility represents the value that can be obtained for some future additional investment building on top of the initial investment already made. For instance, an investment in an enterprise-wide upgrade of an office productivity suite can potentially increase standardization (to increase efficiency) and reduce licensing costs. However, an embedded collaboration feature may translate to greater worker productivity if activated. The collaboration can only be used with additional investment in training at some future point. However, having the ability to capture that benefit has a PV that can be estimated. The flexibility component of TEI captures that value.

RISKS

Risks measure the uncertainty of benefit and cost estimates contained within the investment. Uncertainty is measured in two ways: 1) the likelihood that the cost and benefit estimates will meet the original projections and 2) the likelihood that the estimates will be measured and tracked over time. TEI risk factors are based on a probability density function known as "triangular distribution" to the values entered. At a minimum, three values are calculated to estimate the risk factor around each cost and benefit.

Appendix B: Glossary

Discount rate: The interest rate used in cash flow analysis to take into account the time value of money. Companies set their own discount rate based on their business and investment environment. Forrester assumes a yearly discount rate of 10% for this analysis. Organizations typically use discount rates between 8% and 16% based on their current environment. Readers are urged to consult their respective organizations to determine the most appropriate discount rate to use in their own environment.

Net present value (NPV): The present or current value of (discounted) future net cash flows given an interest rate (the discount rate). A positive project NPV normally indicates that the investment should be made, unless other projects have higher NPVs.

Present value (PV): The present or current value of (discounted) cost and benefit estimates given at an interest rate (the discount rate). The PV of costs and benefits feed into the total NPV of cash flows.

Payback period: The breakeven point for an investment. This is the point in time at which net benefits (benefits minus costs) equal initial investment or cost.

Return on investment (ROI): A measure of a project's expected return in percentage terms. ROI is calculated by dividing net benefits (benefits minus costs) by costs.

A NOTE ON CASH FLOW TABLES

The following is a note on the cash flow tables used in this study (see the example table below). The initial investment column contains costs incurred at "time 0" or at the beginning of Year 1. Those costs are not discounted. All other cash flows in years 1 through 3 are discounted using the discount rate (shown in the Framework Assumptions section) at the end of the year. PV calculations are calculated for each total cost and benefit estimate. NPV calculations are not calculated until the summary tables are the sum of the initial investment and the discounted cash flows in each year.

Sums and present value calculations of the Total Benefits, Total Costs, and Cash Flow tables may not exactly add up, as some rounding may occur.

TABLE [EXAMPLE]
Example Table

Ref.	Metric	Calculation	Year 1	Year 2	Year 3

Source: Forrester Research, Inc.

Appendix C: Supplemental Material

Related Forrester Research

"Embrace The Need For Speed To Avoid Ugly DevOps Practices," Forrester Research, Inc., June 21, 2016

"Use Forrester's Continuous Delivery Assessment Model To Increase Delivery Speed," Forrester Research, Inc., November 6, 2013

Appendix D: Endnotes

[1] Forrester risk-adjusts the summary financial metrics to take into account the potential uncertainty of the cost and benefit estimates. For more information, see the section on Risks.