

An Oracle White Paper
October 2012

Oracle JD Edwards Cloud Computing

“Choosing a deployment strategy that fits”

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Executive Overview

JD Edwards enterprise resource planning (ERP) software has been in the marketplace for well over 30 years with customers ranging from millions to tens of billions in annual revenue. One key reason for JD Edwards' success is an architectural design whereby all transactions are centrally managed and a separate tools layer that is used for administration. The separate tools layer enables products the opportunity to adapt to ever-changing IT platforms, such as the ability to run applications from a tablet or other mobile device. With the rise of cloud as a predominant deployment platform, JD Edwards is proving once again that it can continue to offer rich ERP functionality while simultaneously delivering on the promising benefits of the cloud.

So what is Cloud computing? According to Wikipedia.org "Cloud computing is the use of computing resources (hardware and software) that are delivered as a service over a network (typically the Internet). End users access cloud-based applications through a web browser or a light-weight desktop or mobile device, while the business software and user's data are stored on servers, possibly at a remote location."¹ In practice "Cloud" has come to mean many things to many people. Companies can own and manage their computing solution, yet still be involved in cloud computing by the fact that they have a private cloud for their internal application users. Alternatively, cloud computing can be offered to users via a public cloud or via a combination of both public and private cloud known as a hybrid cloud.

But before getting into the details of cloud options, why is cloud even important? Research shows that "Companies continue to invest in cloud applications because of low upfront cost and faster time to deployment, but those are not the only reasons to move to the cloud. Beyond the initial payback, Nucleus Research found that cloud applications deliver 1.7 times more ROI than on-premise ones, largely because four out of five cloud deployments deliver increasing benefits over time." "Companies deploying cloud applications spend 40 percent less on consulting and 25 percent less on personnel than those deploying on premise, driving the cloud multiplier."²

So what is a typical example of how JD Edwards customers might reap these benefits? Leading organizations that comprise the EnterpriseOne Strategy Council recommended in their *Upgrades Best Practices and Guiding Principles*³ that "JD Edwards Applications should be upgraded every 3 years and JD Edwards Tools should be upgraded to the latest release every year". They also cite the essential need of an upgrade plan to consider options of outsourcing, partnering and cloud. Cloud consideration is recommended because hardware upgrades often coincide with applications upgrades. Also, the flat, per-month service fees typical with cloud services have proven advantageous compared to traditional, capital expenditure to finance hardware upgrades. Similarly, leveraging outsourcing or partners via a service not only yield similar financial benefits but also provide the added benefit of enabling an organization's internal IT resources to focus on business innovation rather than the technicalities of an upgrade.

Oracle Consulting and the global JD Edwards partner community have an abundance of success stories from customers who have leveraged their staff of experts to deploy the latest technology. Companies around the globe are educating themselves to take advantage of specialists who are pushing the envelope of cloud computing. The JD Edwards partner community is full of talent that is constantly finding new ways to reduce costs, ensure high performance, and ultimately help customers become change agents in the face of highly competitive markets. Cloud computing is not new, it is however constantly morphing, full of viable possibilities. JD Edwards made its reputation as the lowest total cost of ownership

¹ Wikipedia.org

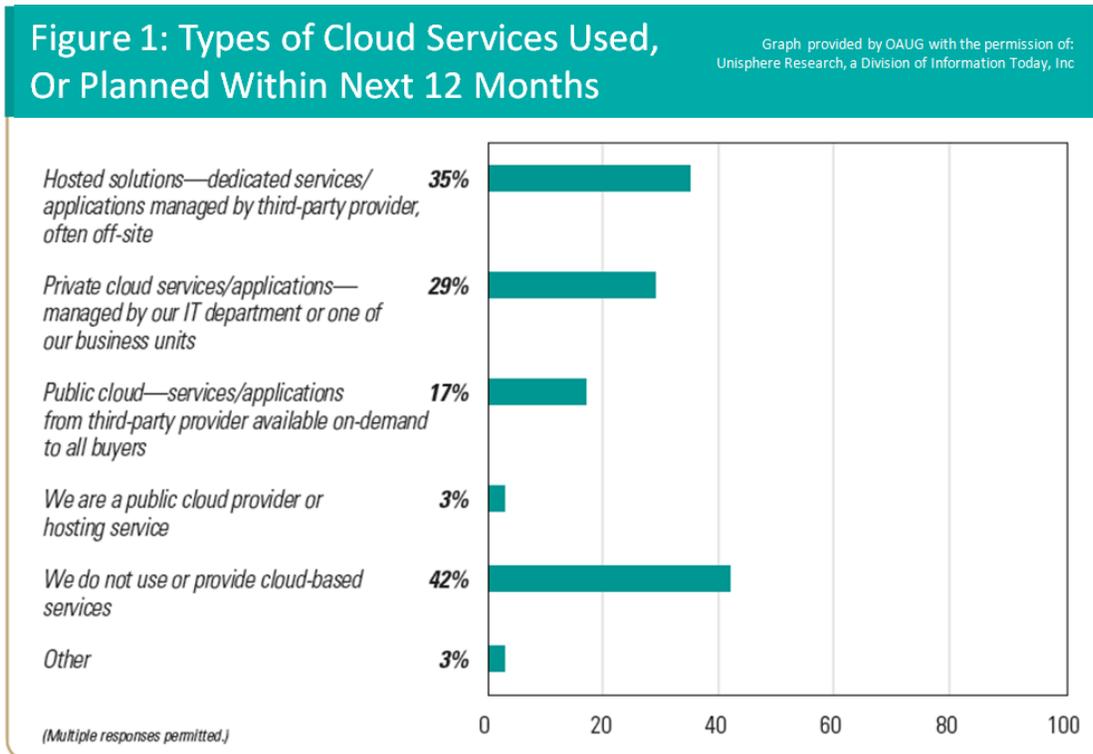
²Cloud Delivers 1.7 Times More ROI, Nucleus Research Note Document M108, September 2012, nucleusresearch.com

³ JD Edward EnterpriseOne Strategy Council report session #100760 JD Edwards Strategy Council Upgrade Guiding Principles, Oracle OpenWorld, October 2011

(TCO) most flexible enterprise resource planning (ERP) solution suite in existence and cloud computing offers an opportunity to set a new industry standard in even lower TCO and higher flexibility. The purpose of this white paper is to provide insight on the considerations to weigh when choosing options to leverage cloud computing for your JD Edwards EnterpriseOne deployment.

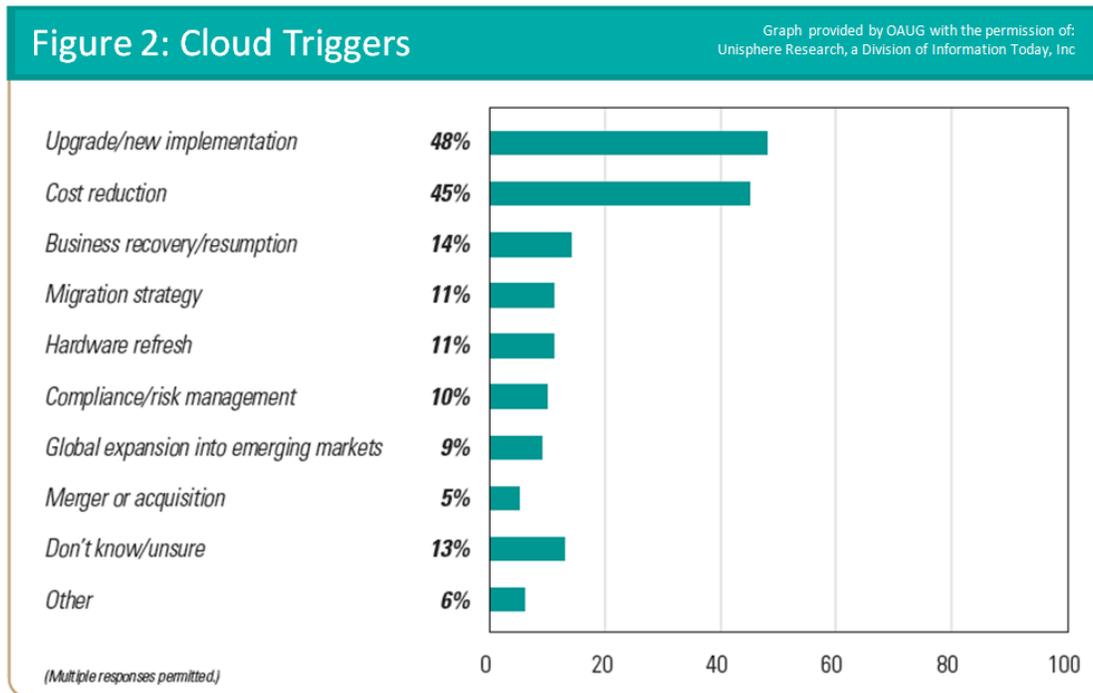
Introduction

In a recent survey of the Oracle Applications User Group (OAUG)⁴, 35 percent of respondents currently have hosted solutions, defined as dedicated applications managed by a third party, often off-site. Private clouds follow at 29 percent and 17 percent use public cloud services. In total, 55 percent of the survey respondents subscribe to at least one of three leading cloud approaches; hosted services, private cloud, and public cloud. (See Figure 1.)



⁴ Cloud at the Crossroads: 2012 OAUG Survey on Application Delivery Strategies was produced by Unisphere Research and sponsored by Oracle. Unisphere Research is the market research unit of Unisphere Media, a division of Information Today, Inc., March 2012

Contrary to popular belief that businesses turn to cloud as an alternative to their own IT departments, the impetus for cloud computing actually comes from IT executives more often than not. Also, according to the survey summary, upgrades and new implementations (48 percent) outranked cost savings (45 percent) as the top triggers for moving to cloud based environments. (See Figure 2.)

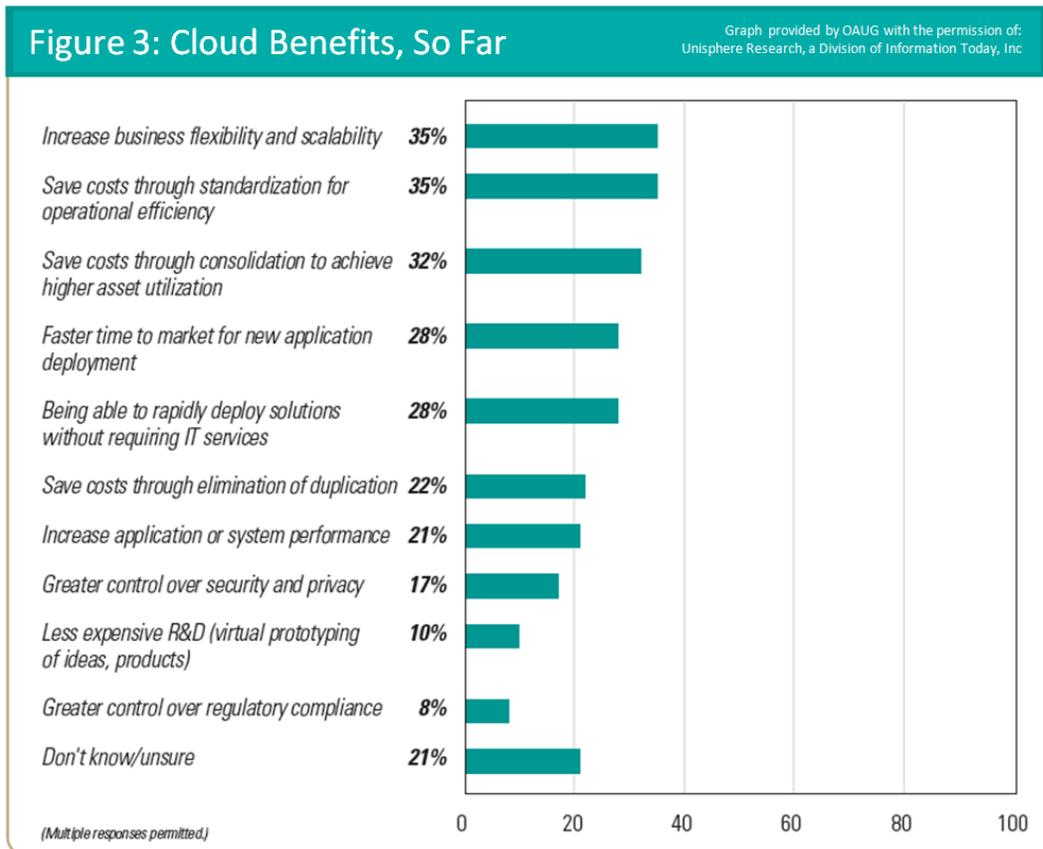


Effects of Cloud Computing on Business

Companies have finite resources and are heavily focused on profitability, increasing revenue, controlling costs, and promoting differentiators in this fiercely competitive economy. Many corporations are examining the options available and leveraging IT service providers in an effort to enable the business and employees to concentrate their energy on what makes the company successful. Owning hardware and maintaining a datacenter has become a specialized industry of its own. For those companies who are shopping for an ERP system to take them into the future, there are new alternatives such as software as a subscription or service (SaaS) that may be very viable. For companies who have already invested in JD Edwards' complete solution, on-premise or off premise management by a third party is a reasonable and viable alternative to recruiting internal IT experts.

Even companies who aggressively focus all resources on the important attributes of their business are faced with a common question: My hardware is old, expensive and complex; integrating my customizations with new features in the latest upgrade is challenging; and my staff is working hard just to keep everything working... so what are my alternatives?

Per the OAUG 2012 survey, 35 percent of companies using the cloud indicate they have been able to enhance their organizations' abilities to transform and adapt to changes, and increase business flexibility and scalability. Saving costs through standardization also scored 35 percent. (See Figure 3.)



Adoption of cloud computing options depends on a number of variables and in some cases it may not be an option at all because of corporate and governmental restrictions. Let's consider the cases of existing vs. new JD Edwards customers:

- Existing JD Edwards Customer** - As an existing JD Edwards customer, keeping your software current through regular upgrades enables the business to take advantage of new application functionality, user interface capabilities, and mobile applications. But, won't upgrading require a complex, time consuming and resource intensive investment before these new capabilities can be assessed? No, many Oracle JD Edwards partners will upgrade your ERP system, place it in a secure, cloud environment, and give users access to data in the latest software versions within a short period of time. But why stop there? Many companies indicate they have been able to cut costs as a result of adopting a cloud deployment model

(35 percent)⁵ as their ongoing operating model by leveraging providers such as third party hosting providers or Oracle Managed Cloud services.

- Prospective JD Edwards Customer

So, what are the options for new JD Edwards customers? 1.) Purchasing hardware, software, and deploying in a traditional, private cloud hosted on premise. 2.) Purchase hardware, software, and deploy with a third party cloud hosting provider or with Oracle Managed Cloud Services. 3.) After choosing a hardware option as described in 1 or 2, rather than purchase the software, subscribe to JD Edwards software on a per-user-per-month basis via the *JD Edwards Accelerate Solution Private Cloud Computing* (JAS PPC) program available through authorized cloud hosting partners.

Subscription-based software, made available through programs such as JAS PPC, has the distinct advantage of a low upfront cost, and being accounted as an operating expense rather than a capital expense with depreciation, yet provides the same functionality as if you purchased the software. JAS PPC subscription pricing is available for the most popular but not all JD Edwards EnterpriseOne product modules and customers must qualify for this program.

Regardless of whether you are a new or existing JD Edwards customer, cloud hosting on or off premise has advantages. JD Edwards On Demand, offered by Oracle Managed Cloud Services and similar services offered by third party partners host multiple customers, have Database and Application Administrators, Configurable Network Computing (CNC) experts available 24 X 7 across the globe. Many of the cloud hosting providers also employ developers who can customize the JD Edwards instance(s) relative to the unique, market-differentiated requirements for your specific business process or industry. These operational and development resources are invaluable and can be difficult to recruit and/or unaffordable for many companies.

Cloud Defined

The National Institute of Standards (NIST) has gained broad support from the industry for the following definition of cloud computing “Cloud computing is a model for enabling ubiquitous, convenient, on-demand network access to a shared pool of configurable computing resources (e.g., networks, servers, storage, applications, and services) that can be rapidly provisioned and released with minimal management effort or service provider interaction”.⁶ NIST also identifies three cloud service models and three cloud deployment models that are described below.

Cloud Service Models

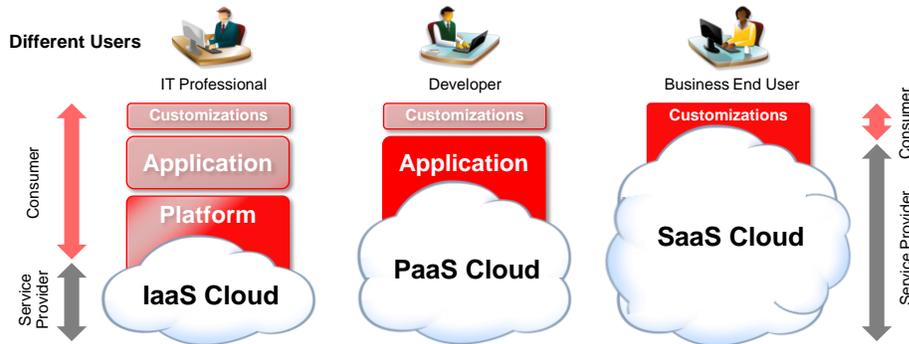
There are three different service models that describe how much of the overall cloud solution is provided and maintained by the cloud service provider vs. the customer:

⁵ Cloud at the Crossroads: 2012 OAUG Survey on Application Delivery Strategies was produced by Unisphere Research and sponsored by Oracle. Unisphere Research is the market research unit of Unisphere Media, a division of Information Today, Inc., March 2012

⁶ The NIST Definition of Cloud Computing by Peter Mell and Timothy Grance, Special Publication 800-145 National Institute of Standards and Technology (NIST) an agency of the U.S. Department of Commerce under the Federal Information Security Management Act (FISMA) of 2002, Public Law 107-347.

Customers Have a Choice of Clouds

IaaS, PaaS or SaaS



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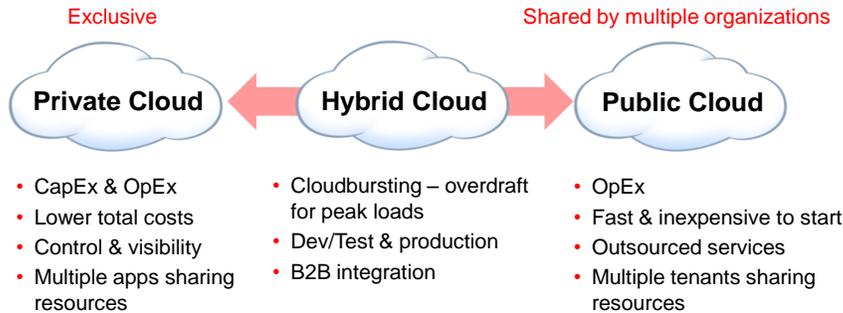
- **IaaS** or Infrastructure as a Service - delivers computer servers, storage, and networking hardware as a service. This infrastructure hardware is often virtualized, so virtualization, operating system, and management software are also part of IaaS as well. A well-known example of IaaS is Amazon's Elastic Compute Cloud (EC2) and Simple Storage Service (S3).
- **PaaS** or Platform as a Service – Includes everything described in IaaS and also an application development and deployment platform delivered as a service for developers to build, deploy, and manage applications. The platform typically includes database, middleware, development tools and management tools, all delivered as a service via the Internet. PaaS offerings are often specific to a programming language or APIs, such as Java, Python, or Ruby. A virtualized and clustered computing architecture is often the basis for PaaS offerings, because virtualization and clustering enable resource sharing and ability to scale on-demand, which is key requirements for clouds. Oracle offers a comprehensive PaaS solution for enterprise private clouds as well as service provider public clouds.
- **SaaS** or Software as a Service – Includes everything described in IaaS and might include some of the capabilities of PaaS and also includes end-user applications delivered over the internet. There are hundreds of subscription service offerings available today, ranging from horizontal enterprise applications to specialized applications for specific industries. *Oracle CRM On Demand* is an example of a SaaS offering. For JD Edwards, qualified customers can subscribe to certain JD Edwards EnterpriseOne product modules through partners that participate in the *JD Edwards Accelerate Solution Private Partner Cloud (JAS PPC)* program. For a complete list of the Oracle Partners authorized to provide JD Edwards EnterpriseOne Subscription Based Software, please visit: https://solutions.oracle.com/scwar/sc/index.html?canned_search=SP_OACC_SUPR

Cloud Deployment Models

In addition to the three service models described above, cloud deployment models describe the extent to which the cloud is shared with other customer (or 'tenants'). Three possible models are depicted in the following figure:

Customers Have a Choice of Clouds

Private, Public or Hybrid



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- **Private Clouds** – For exclusive use by a single organization and typically controlled, managed, and hosted by the organization’s IT department. The hosting and operation of private clouds may also be outsourced to a third party service provider, but a private cloud remains for the exclusive use of one organization. This is the default deployment option for customer’s applications that require the highest data security.
- **Public Clouds** – For use by multiple organizations (tenants) on a shared basis and hosted and managed by a third party service provider. Public clouds are a form of outsourcing. The degree of resource sharing varies. Shared resources can include some or all of facilities, network, storage, computing servers, databases, middleware, and applications. Google, Facebook, LinkedIn, Yahoo, Amazon, and Expedia are examples of public clouds.
- **Hybrid Clouds** – When a single organization adopts both private and public clouds in order to take advantage of the benefits of both. This is the expected configuration for most companies that leverage the cloud for the foreseeable future as it allows organizations to flexibly deploy new applications quickly to reap their benefits at a lower cost point while keeping sensitive, differentiated workloads in a more tightly controlled private cloud.

Benefits of Private vs. Public Clouds

The two basic models of public and private clouds have a number of compelling business benefits, some of which are common to both public and private, while others are only for one or the other.⁷ Benefits of both public and private clouds include:

- **High efficiency** – Because both public and private clouds are based on clustering and virtualization, both offer high efficiency and high utilization due to the sharing of pooled resources, enabling better workload balancing across multiple applications.

⁷ Oracle Cloud Computing White Paper – May 2010 Authors; George Demarest, Rex Wang

- High availability – Another benefit of clustering is that applications can take advantage of a high availability architecture that minimizes or eliminates planned and unplanned downtime, improving user service levels and business continuity.
- Elastic scalability – Clustering also provides public and private clouds with elastic scalability, the ability to add and remove computing capacity on demand with no downtime. This is a significant advantage for applications with highly variable workload or unpredictable growth, or for temporary applications.
- Fast deployment – Because both public and private clouds can provide self-service access to computing resources, and because the software and hardware components are standard, reusable, and shared, application deployment timeframes are greatly accelerated.

Some benefits unique to public cloud include:

- Low upfront costs – Public clouds are faster and cheaper to get started as they provide users with a low barrier to entry with no need to procure, install, and configure hardware or software.
- Economies of scale – Large public clouds enjoy economies of scale in terms of equipment purchasing power and management efficiencies which often results in lower fees for customers.
- Outsourced management – Public clouds do not require IT personnel to manage, administer, update, and patch. Users rely on the service provider instead of the internal IT department.
- Operating expense – Public clouds are paid out of the operating expense budget, most often by the users' line of business, not the IT department. Capital expense is avoided, which can be an advantage in some organizations.

Benefits that are unique to private cloud include:

- Greater control of security, compliance, and quality of service – Private clouds enable IT to maintain control of security (data loss, privacy), compliance (data handling policies, data retention, audit, regulations governing data location), and quality of service (since private clouds can optimize networks in ways that public clouds do not allow).
- Easier integration – Applications running in private clouds are easier to integrate with other in-house applications, such as identity management systems.
- Lower lifetime costs – Private clouds with sufficient scale may be cheaper over the long term compared to public clouds just as in any rent vs buy financial decision. According to several analyses, the breakeven period is most often between two and three years.
- Capital expense and operating expense – Private clouds are funded by a combination of capital expense and operating expense.

Cloud Challenges

There are also a number of challenges and barriers to the adoption of public cloud computing. The top concern far and away is security. While one can debate the relative security of public clouds versus in-house data centers, the reality is that many organizations are not comfortable entrusting certain sensitive data to public clouds where they do not have full visibility and full control. So some particularly sensitive applications remain in-house while others may take advantage of public clouds. Another concern is quality of service, since public clouds, such as Amazon and Google, may not be able to fully guarantee service level agreement in terms of performance and availability. A third area of concern is the ability to integrate with in-house systems and adapt applications to the organization's business processes. A fourth

concern is being locked-in for a 24, 36 or 48 month term, since users may want to switch to another provider or to in-house at a later point in time.

To recap, cloud computing is characterized by real, new capabilities such as self-service, auto-scaling, and chargeback, but is also based on many established technologies such as clustering, virtualization, service oriented architecture (SOA), shared services, and large-scale, systems management automation. Cloud computing offers compelling benefits in terms of speed and cost, but also presents serious concerns around security, compliance, quality of service, fit, and lock-in. Today some organizations have fully embraced cloud computing, while others have adopted cloud computing for a portion of their business. Most are at least evaluating the pros and cons of cloud. For many organizations, it makes sense to adopt both public and private cloud computing for portions of their business. These organizations are running some applications in public clouds, other applications in private clouds, and some applications remain as they are. With this view of cloud computing in mind, we now turn to the role that Oracle and its products and services offer to customers considering cloud.

Oracle Cloud Computing Strategy

Oracle's broad and comprehensive cloud computing strategy provides customers choice of deployment options via private and public clouds and managed cloud services to facilitate a pragmatic approach toward customers' adoption of cloud computing. Oracle's newest application family known as *Fusion Applications* were built to fully leverage Oracle technology in the cloud and co-exist with other Oracle applications such as JD Edwards. Additionally, Oracle has several public cloud offerings as described below in *Oracle Cloud*. Lastly, Oracle provides a leading service where customers can rely on Oracle to manage their cloud for them such as the JD Edwards On Demand service offered by *Oracle Managed Cloud Services*.

Oracle Managed Cloud Services

Oracle Managed Cloud Services enable organizations to leverage their Oracle investments to extend into the cloud with greater value, choice, and confidence. With over twelve years experience serving millions of end users; Oracle Managed Cloud Services is a recognized leader. Oracle delivers enterprise-grade, end-to-end managed cloud services across its broad portfolio of business applications, middleware, database, and hardware technologies.

Oracle Managed Cloud Services helps customers benefit from the latest Oracle technologies and innovations faster through coordination with Oracle development, while reducing risk with world-class security and best practice regulatory compliance.

Oracle Managed Cloud Services provides enterprise-grade hosting and management services for Oracle technology and applications, including Oracle JD Edwards.

Some interesting statistics regarding Oracle Managed Cloud Services:

- Delivering complete end-to-end managed cloud services since 2001
- Millions of end users
- Managed Cloud Services customers experience significant reductions in downtime for upgrades, far fewer average SRs and much faster service request resolution time
- Largest Managed Cloud Services JD Edwards customer has 5,500 named users with 700 concurrent users
- Largest JD Edwards database managed by Managed Cloud Services is approximately 3.5 terabytes

Oracle Fusion Applications

Designed from the ground up, using the latest technology advances, and incorporating best practices gathered from thousands of customers, Oracle Fusion Applications are 100% open standards-based business applications that provide a new standard for the way we innovate, work and adopt technology. Fusion applications are a complete suite of modular applications spanning: Customer Relationship Management, Human Capital Management, Financials, Supply Chain, Procurement, Governance, Risk and Compliance, and Project Portfolio Management. Oracle Fusion Applications work together with existing applications including JD Edwards to evolve business to a new level of performance. Deployment options range from on premise to public clouds and private clouds or a hybrid combination. Oracle Applications Unlimited is Oracle's commitment to customer choice through continuous investment and innovation in current applications offerings such as JD Edwards. Oracle's next-generation Fusion Applications build upon that commitment, and are designed to work with and evolve your existing JD Edwards applications investments. Oracle's lifetime support policy helps ensure customers will continue to have a choice in upgrade paths, based on their enterprise needs.

There are a number of Oracle JD Edwards customers that have chosen to complement their JD Edwards implementation with Oracle Fusion Human Capital Management in the cloud.⁸ For more information on Oracle Fusion Applications visit <http://oracle.com/fusion>.

Oracle Cloud

Oracle Cloud offers a broad portfolio of software as a service applications, platform as a service, infrastructure as a service and social capabilities, all on a subscription basis. Oracle Cloud delivers instant value and productivity for end users, administrators, and developers alike through functionally rich, integrated, secure, enterprise cloud services. With Oracle Cloud, you get enterprise-grade application and platform services based on best-in-class business applications and the industry's leading database and application server, managed by experts with over a decade of cloud delivery experience. More than 25 million users rely on Oracle Cloud every day.

Application Services – Enable enterprises to rapidly deploy either a complete suite or a targeted set of end user applications that span numerous mission-critical business functions available with Oracle Fusion applications (see section above) on a robust, professionally managed platform and infrastructure.

Platform Services - Enable developers to rapidly and effectively develop, test, and deploy their own enterprise-class business applications on the industry's #1 database using *Oracle Cloud Database Services* and the #1 application server using *Oracle Cloud Java Services*.

Common Infrastructure Services

Oracle's infrastructure services provide proven, reliable, secure infrastructure for all platform, application, and social services.

Social Services

Oracle Social Relationship Management (SRM) services helps organizations use social data and channels to drive greater customer understanding, make better business decisions, and strengthen relationships.

Any or all of these services can be leveraged by JD Edwards customers to complement their current implementations. For more information on the Oracle Cloud visit <http://oracle.com/cloud>

⁸ <http://www.oracle.com/us/corporate/press/1721581> , <http://www.oracle.com/us/corporate/press/1599649>

Cloud Computing Decision Process

Making a rational decision as to where and how Cloud makes sense for any business is both quantitative and qualitative in nature. On one hand, the cost to deploy any or all systems in house are readily available based on historical figures or industry intelligence and often include software, hardware, data center build and maintenance, support, utilities, contract labor, etc. These statistics when compared to the cost proposals available from cloud service providers can be compared in total, by concurrent user counts or as a percentage of revenue. In addition to the hard costs there are other considerations such as ease of integration, opportunity cost of internal IT focus, value to the business of application capabilities, etc. There can be a temptation to use concurrent user count as a primary criteria whether to leverage cloud, however, while it is one consideration, there are many examples of smaller companies who find more value in owning all information technology as well as examples of very large JD Edwards' customers with thousands of employees and users who have opted to outsource their IT operations to the cloud.⁹ The decision process might be easiest to understand if we start with cases that hold fewer caveats, realizing that as with auto tires, your mileage may vary:

Internal Private Cloud – The most pervasive model for existing JD Edwards customers that have recruited and can maintain a strong internal staff and late model hardware is the traditional, internal private cloud owned and managed by the company. Even though internal IT staff are the primary support organization, many of the most successful JD Edwards customers implemented their ERP system with the aid of an experienced JD Edwards partner who can assist with the initial implementation. Highly unique compliance or integration requirements can also weigh in favor of an internally managed, private cloud.

Shared Services Internal Private Cloud - This model is a form of Internal Private Cloud computing whereby multiple divisions associated with the same parent company collaborate and share the cost of IT. Shared services are another reasonable alternative to reduce the cost associated with information technology. In some companies there is a passionate debate about the advantages of shared services over Outsourced Cloud Computing (described below). If using a shared service is an option for your company or division, political considerations can be as important as cost savings and both should be part of your assessment.

Outsourced Cloud Computing – The JD Edwards ecosystem is as strong as any ERP suite on the market with a multitude of partners who have great depth when it comes to services available. JD Edwards' customers have every advantage when it comes to choices that may include service level agreements, performance guarantees, costs, and disaster recovery. The relationship may be with one entity who provides all the above or it might utilize one organization who is a hosting expert and another who is an authority in application and system administration. JD Edwards customers considering outsourcing any of their computing operations should investigate:

- JD Edwards On Demand offered by Oracle Managed Cloud Services
- Software as a Subscription for JD Edwards customers offered by qualified partners (JAS PPC program as described earlier)
- Cloud hosting services offered by a varied and growing community of able third party providers

Conclusion

Whether it is the utilization of new hardware, operating systems, the latest database capabilities, or the most recent applications and tool releases, the one constant in most industries is fast paced innovation. Hundreds of JD Edwards' customers are hosted across a strong, expert community of hosting partners

⁹ <http://link.brightcove.com/services/player/bcpid62612523001?bctid=1719511254001>

including Oracle Managed Cloud Services that provide proven business value across multiple industries and applications. Outsourced cloud computing is especially a great option for companies looking to:

- Reduce capital investment and internal IT disruption on their path to the latest JD Edwards EnterpriseOne release
- Meet high availability (e.g. 99.9%) uptime on a constrained IT resource budget
- Leverage unique compliance and integration capabilities offered by specific cloud service providers

The permutation of options are endless when further considering a hybrid of each of these models, but the ultimate aim of cloud computing is to enable organizations to optimize their IT investment and focus on the strategic needs of the business to meet competitive market demands.



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Hardware and Software, Engineered to Work Together