LEARNING MADE EASY

2nd Oracle Special Edition

Public PaaS

for dummies®
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Evolve your business to the cloud

Understand the value of public PaaS

Easily experiment with new technologies

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About Oracle

With more than 420,000 customers and deployments in more than 145 countries, Oracle offers a comprehensive and fully integrated stack of cloud applications, platform services, and engineered systems.

Public PaaS

2nd Oracle Special Edition

by Lawrence Miller

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Introduction

Cloud transformation has created massive change for businesses and changed the way people work. Millennials, for example, have different expectations of the workplace than previous generations. Digital innovation is making new business models possible, like Uber, Airbnb, and Spotify. This kind of change creates disruption in many markets.

Organizations can *lead* the transformation of their business and industry with digital technologies like social and mobile services, big data, and the Internet of Things (IoT). At the same time, organizations are under constant pressure to drive down costs through economies of scale and superior IT automation. Industry leaders are embracing Platform as a Service (PaaS) at an ever-increasing pace to drive cost efficiencies and create and exploit new business opportunities.

Key to enabling this transformation is empowering organizations with a modern PaaS that *accelerates* the creation of new products and services for customers, employees, and partners — and delivers capabilities never before imaginable.

Achieving industry leadership and accelerating innovation requires adopting flexible platform services that seamlessly *integrate* with existing enterprise solutions

and optimize IT by allowing workloads to run where they run best (on-premises or in the cloud).

About This Book

Public PaaS For Dummies, Oracle 2nd Special Edition, explains how PaaS enables organizations to embrace the efficiency, speed of service, and information availability that cloud computing offers in a way that delivers to today's growing business demands. This book also explores key PaaS use cases, describes what to look for in a PaaS solution, examines some real-world PaaS success stories, and reveals best practices to help you succeed with PaaS in your organization!

Foolish Assumptions

Every author assumes a few things about his readers. I'm no exception.

First, I assume that you have some familiarity with cloud computing environments and that your organization is considering or is already using the cloud for developing or deploying enterprise applications, among other uses.

Next, I assume that one of the following describes you:

- An IT professional who wants a cloud platform to help you respond faster to business needs and lower costs
- A developer or development manager who wants a cloud platform to reduce operational tasks and accelerate innovation
- A business professional who wants a cloud platform that can extend or integrate a SaaS application to better support end-to-end business processes, collaboration, and business insight.

If any of these assumptions describe you, then this book is for you!

Icons Used in This Book

Throughout this book, I occasionally use icons to call out important information. Here's what to expect.

This icon points out information you should commit to your nonvolatile memory, your gray matter, or your noggin – along with anniversaries and birthdays!

You won't find a map of the human genome or the secret to cold fusion here, but if you seek to attain the seventh level of NERD-vana, perk up! This icon explains the jargon beneath the jargon.

TIP

Tips are appreciated, never expected — and we sure hope you'll appreciate these tips! This icon points out useful nuggets of information.

WARNING

This icon points out the stuff your mother warned you about (well, probably not). But these helpful alerts do offer practical advice to help you avoid potentially costly and frustrating mistakes.

Beyond the Book

There's only so much I can cover in 80 short pages, so if you find yourself at the end of this book thinking "Gosh, this is an amazing book; where can I learn more?" just go to `oracle.com/paas`. There, you can learn more about PaaS and the Oracle Cloud Platform. You can give PaaS a try at `cloud.oracle.com/tryit`.

Where to Go from Here

If you don't know where you're going, any chapter will get you there — but Chapter 1 might be a good place to start! However, if you see a particular topic that piques your interest, feel free to jump ahead to that chapter. Each chapter is written to stand on its own, so you can read this book in any order that suits you (though I don't recommend upside down or backwards). I promise you won't get lost falling down the rabbit hole!

IN THIS CHAPTER

- Defining PaaS
- Recognizing the business need for PaaS

Chapter 1

Driving Innovation with Platform as a Service

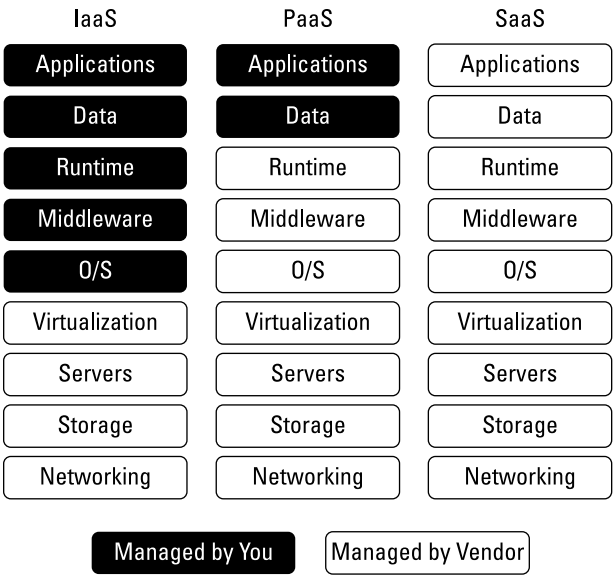
Innovation, business agility, cost efficiencies, a better customer experience — these potential benefits of cloud computing have made it a key component in enterprise IT strategies. In this chapter, you learn all about Platform as a Service (PaaS) and how it delivers those benefits.

What Is PaaS?

PaaS is a category of cloud computing services that provides a platform to develop, deploy, and run applications without the cost and complexity of deploying and managing the required infrastructure. In cloud environments, PaaS is the layer that commonly exists between Infrastructure as a Service (IaaS) and Software as a Service (SaaS). See Figure 1-1.

IaaS provides cloud-based infrastructure services that provide compute, storage, and network capacity. The cloud subscriber is usually responsible for installing, configuring, securing and maintaining any software on the cloud-based infrastructure, such as database, middleware, and application software.

SaaS provides cloud-based business applications, like a human resources, sales, or financial application, running on platform software (such as database and middleware) and infrastructure that are hosted and fully managed by the SaaS provider. The SaaS subscriber typically has little to no visibility into or control of the underlying platform and infrastructure.



Source: Wiley

FIGURE 1-1: Comparing IaaS, PaaS, and SaaS.

A complete PaaS solution provides integrated, cloud-based platform services that include preinstalled and configured database and middleware (such as application and web servers) software — all provided on a cost-effective subscription basis. It can also provide a platform for developing, testing, deploying and securing different kinds of enterprise applications, such as transactional and analytics applications.

PaaS includes self-service, web-based tools that enable businesses to select appropriate configurations for their database and middleware requirements. With PaaS, many software-development tools are often accessible via a web browser.

TIP

In case you're wondering, here's the difference between public PaaS and private PaaS: Public PaaS runs on an infrastructure that is shared by many organizations, whereas private PaaS runs on an infrastructure that is used exclusively by a single organization. Oracle provides a complete PaaS offering so customers have a choice of deployment type and location — either public or on-premises.

What's Driving the Need for PaaS?

Businesses today are constantly challenged by quickly changing markets and business requirements. To stay competitive, businesses need greater agility and innovation, but they still need to keep their IT costs in check.

PaaS enables significant IT cost savings by offering a subscription pricing model and by enabling developers, for example, to focus on application development rather than procuring and managing infrastructure. PaaS also provides the option to use and pay for the environments only when needed. Businesses using PaaS have reported operational

savings of up to 50 percent compared to individual development teams managing internal technology stacks.

PaaS provides speed and agility by offering simpler, instant access to application development and deployment environments in the cloud. PaaS also allows rapid scale up and scale down of these environments as needed, providing significant flexibility that would otherwise not be possible. PaaS solutions further allow you to extend and integrate SaaS and on-premises applications to drive improved decision making, business agility, and company innovation.

IT professionals and architects can use PaaS to move existing applications to the cloud more securely, which can result in simplified IT, lower costs, reduced risk, and streamlined operations. This paradigm shift allows businesses to refocus their resources to innovate faster and take advantage of new markets and business opportunities.

Business professionals can use PaaS to help lead business transformation needed to stay competitive in their industries. PaaS can help businesses increase productivity and data visibility through greater process automation, content and collaboration capabilities, and analytics that deliver real-time business insight.

REMEMBER

PaaS provides a cloud platform that enables users to develop, deploy, and run applications without the complexity of deploying and managing the underlying infrastructure.

Business drivers for PaaS adoption include the need for the following:

- Greater agility, flexibility, and innovation through automated processes, increased collaboration, higher productivity, and real-time business insights
- Accelerated application innovation and time to market
- Improved security to help reduce risk
- Simplified IT, lower costs, and streamlined operations, including integration and connectivity with existing on-premises applications.

DISPELLING A FEW MYTHS ABOUT PaaS

Though understanding and awareness about PaaS and its capabilities have increased, there are still lingering myths that can lead to decisions that result in a whole new set of problems. It's important to understand all your options and how each impacts your business.

Myth #1: PaaS requires a patchwork of vendor solutions. Some cloud vendor offerings

are piecemeal and require different solutions from multiple vendors that then lack the integration and comprehensive capabilities that companies need. However, you can choose a complete PaaS offering from a single vendor that provides the built-in integration, connectivity, and extensibility that organizations require among all their services, as well as with any on-premises infrastructure.

Myth #2: Cloud will lock you in. Without question, some cloud service providers would like nothing better than to lock you into their proprietary cloud platform. But businesses have lots of options that will allow them to avoid lock-in — provided they prioritize solutions that:

- **Are complete:** Offer integrated solutions that reduce complexity
- **Are open:** Deliver optimum flexibility as their organization changes over time
- **Offer choice:** Allow for coexistence of private and public cloud installations
- **Are secure:** Deploy multiple layers of physical and logical controls from the datacenter to access controls

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Myth #3: All clouds provide the same cost-performance benefit. Using low-cost commodity servers is an approach many cloud providers favor. However, cloud environments run on servers and infrastructure of all kinds. Choosing the right cloud service provider with the right infrastructure for your business is critical. Here are two important questions to consider when choosing a cloud platform:

- Are you getting the best price/performance possible?
- How does your quality of service (scalability, performance, availability, reliability) compare against other clouds?

As you dig into these questions, you may discover that commodity hardware doesn't always provide the best value in terms of scalability, performance, availability, and reliability. Infrastructure that is optimized and specifically engineered for higher performance and efficiency often delivers the best value in the cloud.

Myth #4: Pay-per-use is the way to go for PaaS. Paying for the use of PaaS on a per-minute or hourly basis may sound economical, but the costs are variable and can add up very quickly. Pay-per-use makes a lot of sense for short-term

usage, or large fluctuations in capacity needs. But fixed monthly or annual costs are often the better choice for long-term application deployments. Prepaid subscriptions can also offer significant cost benefits. So consider what's most economical for your particular application and weigh your options.

Myth #5: PaaS isn't secure. Security has long been one of the top concerns among organizations considering a move to the cloud. The fact is that businesses often improve application and data security by leveraging enterprise-grade public clouds. Many corporate data centers have limited security resources and expertise, challenges meeting regulatory requirements, outdated software and hardware, and don't perform regular security audits and assessments. On the other hand, security is a must for any public cloud provider, replete with the following:

- A dedicated team of cloud security experts
- Processes that ensure compliance with regulatory and industry standards
- Comprehensive measures that include layers of physical and logical security controls

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- Third-party security audits
- Automatic updates for managed hardware and software

Still, not all cloud security is equal and the best advice is to review your cloud provider's security technology and practices to understand any potential security risks.

Myth #6: The biggest benefit of PaaS is lower IT costs. Reducing operational and capital costs are certainly good reasons for adopting cloud computing. But these days, adopting cloud-based solutions is rarely just about saving money. Businesses are realizing that ease of use supported by a predefined service catalog, self-service provisioning, and auto-scaling drives speed of deployment, business innovation, and adaptability to changing business needs. Others view PaaS as a way to gain flexibility and agility. The biggest benefit of PaaS may differ from one business to the next and is usually directly tied to whatever issue is driving businesses to adopt PaaS in the first place.

IN THIS CHAPTER

- Migrating from on-premises to the cloud
- Integrating PaaS and IaaS
- Using analytics
- Managing the hybrid cloud

Chapter 2
Exploring PaaS Use Cases

In this chapter, you discover several common business use cases for leveraging PaaS.

Developing and Testing New Applications

Developing and testing applications in the cloud is the most common use case for PaaS today. Businesses

develop and test new applications or SaaS application extensions in the cloud or just move the testing of on-premises deployed applications to the cloud while deploying their production environment in their own data centers. This approach enables application developers to quickly and easily spin up development and testing environments in the cloud, usually in minutes. Because there is no need to procure, deploy, and maintain additional infrastructure and software licenses, businesses can often create new innovative applications in the cloud significantly faster, safer, and at a fraction of the cost of an on-premises environment.

Key benefits include the following:

- Lower development costs
- Acceleration of application development with instant access to new dev/test environments.
- Increase in developer/IT productivity by eliminating the need to set up and manage infrastructure for dev/test.
- Improved security by masking sensitive production data for nonproduction use.

Check out the Magrabi Optical customer success story in Chapter 4 for a real-world example of this use case.

Lifting and Shifting Applications to the Cloud

This PaaS use case involves taking an existing on-premises application and moving it to the cloud. This generally means taking existing databases, middleware, and applications and simply redeploying them onto a cloud-based platform without changing any code.

REMEMBER

The key to making this possible is having the same technology across on-premises and cloud environments.

For example, rather than spending resources to re-create application user accounts and entitlements, some identity management solutions will enable a more seamless user experience when supporting cloud applications. This means accounts can easily be moved from on-premises to the cloud, or the two can operate in a synchronized model.

Key benefits can include the following:

- Lower total cost of ownership (TCO) by reducing data center footprint and need for in-house hardware for enterprise apps
- Faster on-boarding of cloud apps and users by synchronizing on-premises identity repositories
- Capability to leverage existing investments in platform, applications, and technical skills

- True application portability, not only from development to test to production, but also between different prototyping and proof-of-concept (POC) environments
- Increase performance, scalability, availability, and reliability of existing enterprise applications

Extending SaaS Applications

Many businesses have requirements that aren't addressed by standard functionality in the SaaS applications they've previously deployed, particularly as needs change over time. In such cases, businesses can leverage application development cloud services to develop and deploy custom code, or complete application extensions that broaden and customize the functionality of their SaaS applications. Businesses can also extend SaaS applications with platform services that provide additional capabilities such as document sharing or analytics.

TIP

Businesses can also use integration cloud services to integrate their SaaS applications (data and businesses processes) with on-premises applications, as well as other cloud and mobile applications.

Key benefits include the following:

- Better support for the business by addressing unique application requirements quickly and cost-effectively
- Enable secure applications using standards-based identity and API management cloud services
- Capability to extend and enhance embedded static reports in cloud applications (SaaS) with advanced, multiperiod, cross-functional analytics, discovery, content, and social collaboration, process automation, mobility, and data visualization
- Capability to eliminate data silos and fragmented business processes

Head to Chapter 4 to find out how Avaya extended its SaaS applications with PaaS.

Integrating PaaS and IaaS

The move to Infrastructure as a Service (IaaS) is picking up speed as enterprises realize they can lose their competitive edge with a business-as-usual IT infrastructure. Industry analysis shows the growing importance of IaaS for moving any workload to run in a cloud environment, and businesses are seeing the benefits.

One scenario for using IaaS is to run a custom-built infrastructure, perhaps running a mix of different products. Perhaps you want to move an existing on-premises workload to the cloud, but the existing platform environment doesn't support your current environment release level. Moving it to a tailor-made IaaS environment allows you to implement exactly what your application needs, and once the workload is in the cloud, it's much easier to integrate that workload with other applications you may be choosing to run on the PaaS environment. This capability to leverage and integrate with the other applications running on the platform is a key advantage to using IaaS as well.

Seamless integration between PaaS and IaaS provides businesses with key benefits, including:

- Lower integration and maintenance costs
- Simplified deployment and operation of integrated business applications in the cloud

Analyzing Business Data from Any Source

Analytics platforms provide valuable consumer, product, behavioral, and many other insights. Today, analytics defines the modern organization by harnessing its collective intelligence. This next-generation collaboration

combines the wisdom of people with the power of machine learning and artificial intelligence.

REMEMBER

Analytics technologies allow people to combine data from any source — cloud, mobile, on-premises, big data repositories, Hadoop, the Internet of Things (IoT), or local files — for a complete view of their business.

Key benefits include the following:

- Faster and greater insight across every area and dimension of the business to drill down and through every level of information — from big picture summary to detailed records.
- Efficient discovery of hidden patterns and trends through end-user data visualization and exploration.
- Complex data becomes more accessible, understandable, and usable when it's converted from static numbers into charts, timelines, and other visual formats.
- Leveraging PaaS compute resources for analysis of large datasets from multiple disparate sources.
- Leveraging visual data exploration with machine learning and artificial intelligence to discover insights and reveal the significance of all data.

Learn more about this use case with an actual example from SoftBank in Chapter 4.

Sandboxing for Testing Platform Upgrades

Every business with on-premises application deployments has to deal with upgrades. For most IT organizations, platform upgrades represent risk, uncertainty, and increased cost.

REMEMBER

Increasingly, businesses are turning to PaaS to provide low-cost, low-risk sandbox environments for testing application platform (database and middleware) upgrades.

Key benefits include the following:

- Reduces cost and risk of testing software upgrades
- Accelerates testing of software upgrades
- Increases frequency of uneventful, successful upgrades
- Focuses IT resources on supporting the business rather than being IT infrastructure experts

See how Flexagon uses PaaS for sandboxing in Chapter 4.

Managing the Hybrid Cloud

IT operations professionals struggle to piece together effective management approaches as their organizations adopt cloud delivery. Part of the problem is that most customers already have multiple older generation systems management tools that weren't designed for cloud computing.

In addition, as more organizations transition to the cloud, this has created challenges for managing the security of on-premises and cloud environments in a consistent model, without repetitive efforts. Security solutions such as identity management create the basis for application controls both in the cloud and on-premises, so identifying a model where one can either synchronize these identity repositories, or select an identity and access management (IAM) solution designed for a hybrid cloud will mean faster onboarding of cloud apps and users, while ensuring consistency with the on-premises model.

As more organizations focus on the digital experience first and adopt cloud and DevOps practices, eliminating management data silos and embracing machine learning is the only way they can keep up. This is systems management delivered in the cloud.

Key benefits include:

- Enable scarce staff resources to become proactive and plan for the future more accurately through machine learning and big data analytics approaches designed specifically for IT.
- Effectively manage service-level agreements (SLAs) through early detection of application and infrastructure changes.
- Gain better visibility and manage all your technology investments in one place, whether for new development or workload migration in the cloud, or traditional IT deployed in your data centers.
- Bring development, quality assurance, and operations teams closer by eliminating their respective data silos so developers can focus on applications.

IN THIS CHAPTER

- Developing applications
- Securing the cloud experience
- Analyzing business data
- Collaborating in the digital workplace

Chapter 3
Introducing Oracle Cloud Platform

Oracle Cloud Platform can meet the needs of developers, IT professionals, and business users with a portfolio of platform services that enables them to securely drive innovation and business transformation. In this chapter, you get an overview of the many service offerings in Oracle Cloud Platform.

Oracle Cloud Platform for Application Development and Deployment

One of the true "killer" use cases for cloud computing is application development and testing. The payback from using a public cloud platform to build, test, and deploy applications is compelling with the capability to do the following:

- Self-provision development and testing environments (also known as DevOps), so you can start building applications without having to wait for IT to set up hardware and software.
- Leverage on-premises security profiles (identity) in the cloud for rapid onboarding applications, devices, users, and groups, before shifting into production.
- Integrate application security rapidly through secure application programming interfaces (APIs) or cloud access security brokers (CASBs) that analyze user behavior of cloud apps against approved usage policies.
- Quickly get applications into production and scale those applications as required.
- Collaborate with other developers and architects on the creation of the application.

Here's what to look for when evaluating a PaaS solution for developing and deploying business applications:

- The capability to develop and deploy nearly any type of application, including enterprise apps, lightweight container apps, web apps, mobile apps, and more.
- Support for *polyglot* (multilanguage) development environments.
- Layers of security defense from silicon up to applications, and consistent security policies across hybrid cloud environments.
- Support for Java standards, so DevOps teams can use familiar architectures, utilities, and products — including integrated development environments (IDEs).
- The same support for technology and standards across public and private clouds, resulting in maximum flexibility. Look for full compatibility for applications and databases from on-premises to cloud to support a hybrid cloud strategy.
- The capability for business users to build simple and secure apps without requiring coding experience.
- Support for complete application lifecycle development and management.

Products in the Oracle Cloud Platform for Application Development include the following:

- **Oracle Java Cloud Service:** Enables easy, rapid, and agile deployment of Java Enterprise Edition (EE) applications with full control and flexibility of your applications in the public cloud.
- **Oracle Application Container Cloud Service:** Develop cloud native, twelve-factor style applications on a modern polyglot platform with Java Standard Edition (SE), PHP, Node.js, and others.
- **Oracle Mobile Cloud Service:** A mobile backend as a service (MBaaS) that simplifies mobile application development and integration to on-premises or cloud-based business applications.
- **Oracle Container Cloud Service:** Provides an easy and quick way to create an enterprise-grade container infrastructure with comprehensive tooling to compose, deploy, orchestrate, and manage Docker container-based applications.
- **Oracle Developer Cloud Service:** Simplify team-based development with a turnkey development environment that provides tools to manage tasks, track issues, integrate builds, and collaborate with other developers.

- **Oracle Application Builder Cloud Service:** Rapidly create and host business applications with a visual development environment in your browser. Allows business users to build solutions quickly — without the need for developers.

The twelve-factor app is a methodology for building software as a service (SaaS) apps. Learn more about the twelve-factor methodology at `https://12factor.net`.

Securing the Oracle Cloud Platform

As more organizations move to the cloud, security is high on the list of concerns. With data being the most valuable asset an organization possesses, moving data to the cloud potentially introduces increased risk if security isn't viewed as a foundational building block. Each new application establishes a new user provisioning system, event/alert repository, application database, and risk of exposure to customer and financial information. A comprehensive security strategy across all of these elements becomes a necessity.

TIP

Migrating to the Oracle Cloud provides an opportunity for organizations to increase their security, decrease risk, and expand their ability to scale, all while decreasing the amount of staff required to maintain the environment.

This opportunity starts with integrating security into the development of applications, with solutions like API Platform Cloud Service. It expands to the integration of applications into an identity-driven framework using Oracle Identity Management across on-premises and cloud environments, then implementing those identity-driven policies at the application layer to identify usage characteristics. Oracle Cloud Access Security Broker (CASB) Cloud Service helps manage real-time analysis of application requests, and examines how both sanctioned and unsanctioned (shadow IT) applications are used, on a per-user basis, to determine if corporate policies are being enforced. Securing data is more important than ever to ensure content is not only encrypted, but managed end-to-end with full audit trails using Oracle data security capabilities.

The final step is audit and analytics. No matter whether the data is on-premises or in the cloud, a complete audit trail must be collected for reporting and compliance. Oracle Compliance Cloud Service helps ensure your organization is meeting required corporate and regulatory compliance and security baseline goals.

You also need to monitor, apply behavior analytics to organizational events, and identify advanced stealth attacks that may be using multiple vectors for compromising accounts, databases, applications, and systems.

A holistic approach to PaaS security enables the following:

- Preventing unauthorized access to sensitive data in order to reduce risk and exposure
- Detecting suspicious behavior and enabling step-up and multifactor authentication mechanisms
- Responding to real-time threats by analyzing events across the organization, correlating, and assessing for learning
- Predicting future threats using user and entity behavioral analytics and machine learning

Look for a comprehensive cloud-based security solution that:

- Repurposes existing security investments for new cloud applications
- Identifies advanced threats by analyzing events and alerts across the organization
- Protects unauthorized access to data throughout its lifecycle, whether on-premises or in the cloud

- Reduces the risk posture to the organization by implementing consistent security audit profiles across users, devices, and applications
- Analyzes the behaviors of applications against acceptable use policies established for each cloud service and user
- Provides complete end-to-end lifecycle management of identities on-premises and in the cloud

Products in the Oracle Platform for Security include:

- **Oracle Database Security:** Oracle's comprehensive portfolio of database security solutions ensure data privacy, protect against insider threats, and enable regulatory compliance.
- **Oracle Identity Management:** Oracle's identity management solution set enables you to secure critical applications and sensitive data, lower operational costs, and comply with regulatory requirements.
- **Oracle Identity Cloud Service:** Manage identities for both cloud and on-premises applications in a truly hybrid cloud model. Allows organizations to establish one identity repository and process across cloud and on-premises.

- **Oracle CASB Cloud Service:** Enables organizations to extend threat detection, predictive analytics, security configuration management, and compliance in a single solution for protecting your cloud applications and data.
- **Oracle API Platform Cloud Service:** Develop APIs in a secure, agile environment, all while keeping an eye on key performance indicators for every aspect of the lifecycle. Allows organizations to rapidly deploy a security layer to existing API-driven applications.
- **Oracle Compliance Cloud Service:** Allows you to manage changes and control configurations including industry standard and custom compliance evaluations and reports.
- **Oracle Security Monitoring and Analytics Cloud Service:** Leverages the full array of Oracle Cloud Platform for Systems Management data and threat feeds to detect anomalies and identify weaknesses with policy-based remediation, resulting in continually hardened systems.

Oracle Cloud Platform for Data Management

As the volume and variety of enterprise data grows, organizations need a broad range of capabilities to capture and manage this valuable asset.

Oracle Cloud Platform for Data Management offers a complete and integrated environment to manage data for development or for production deployment to the cloud. Oracle's Cloud Platform for Data Management helps businesses leverage enterprise capabilities while simplifying access for IT and developers. With Oracle Cloud Platform for Data Management, organizations can choose to store business-critical data on-premises, in the Oracle Cloud, or in a hybrid cloud environment. Businesses can preserve their existing investment with the same Oracle Database capabilities in the cloud as Oracle Databases deployed on-premises — the same software, architecture, and tools — so you can find complete compatibility from development in the cloud to deployment on-premises, or vice versa, without the need for retraining and application code changes.

REMEMBER

Whether you're developing applications or migrating data management to the cloud, you have instant access to enterprise-grade database capabilities with the same experience, whether on-premises or in the cloud.

Products in the Oracle Cloud Platform for Data Management include the following:

- **Oracle Database Schema Cloud Service:** Provides a database schema that's up in minutes, is fully managed by Oracle, and includes Oracle Application Express (APEX), a rich browser-based

development environment that doesn't require extensive coding skills.

- **Oracle Database Cloud Service:** Provides a full Oracle Database instance that runs exactly as it does on-premises, and offers automated administration, a broad range of service level choices, layers of security defense, and centralized hybrid cloud management.
- **Oracle Database on Oracle Bare Metal Cloud Service:** Oracle Databases can now be deployed on physical servers on Oracle Cloud with full elastic cloud scale, control, predictable performance, and the same compatibility with on-premises Oracle databases. Deploy Oracle databases on-demand with dedicated hardware performance, in-depth security, and granular management in a highly durable and available cloud environment.
- **Oracle Database Exadata Cloud Service:** Provides a complete Oracle Database environment with all the options, hosted on an Oracle Exadata Database Machine.
- **Oracle Database Backup Cloud Service:** Provides a simple, cost-effective, and highly scalable solution that securely backs up on-premises or cloud databases, offering end-to-end encryption, triple mirroring, and fast point-in-time recovery.

- **Oracle Database Exadata Express Cloud Service:** Delivers a full Oracle Database experience as a managed cloud service running on Exadata and provisioned in minutes, at an affordable entry-level price. Ideal for small- to medium-sized data and packed with features for modern application development.
- **Oracle Big Data Cloud Service:** Delivers Hadoop as a secure, automated, elastic service that can be fully integrated with existing enterprise data in Oracle Database. Discover relationships and connections among customers, organizations, and assets, and enrich your big data with location. Handle the most challenging graph, spatial, and raster processing workloads on Apache Hadoop and NoSQL database technologies.
- **Oracle Big Data Cloud Service — Compute Edition:** A fully managed, elastic service providing a platform for big data management and analytics.
- **Oracle Big Data Preparation Cloud Service:** Provides a highly intuitive and interactive way for analysts to prepare unstructured, semistructured, and structured data for downstream processing.
- **Oracle Big Data SQL Cloud Service:** Extends Oracle SQL to query all data in Big Data Cloud Service. Existing applications using SQL can now easily access data in Hadoop, and Oracle Database security policies can be applied to Hadoop data.

- **Oracle NoSQL Database Cloud Service:** Provides an extremely fast, scalable, and distributed database service for storage and retrieval of any type of data, including JavaScript Object Notation (JSON) documents, Key-Value pairs and Table data types with built-in high availability; atomicity, consistency, isolation, durability (ACID) transactions; and parallel query.
- **Oracle MySQL Cloud Service:** Delivers a secure, cost-effective, and enterprise-grade MySQL database service, built on the proven MySQL Enterprise Edition and powered by Oracle Cloud, to help customers rapidly pioneer innovative applications.

Oracle Cloud Platform for Integration

The rapid shift from on-premises applications to a hybrid mix of SaaS and on-premises applications has introduced significant challenges for companies attempting to simplify enterprise application integration.

REMEMBER

One reason this challenge exists is the ease in which lines of business (LOBs, such as marketing, sales, customer support, and others) can subscribe to multiple, disparate SaaS applications with little or no involvement from internal IT.

Once the LOB starts using the SaaS application, however, there is often a need to integrate with existing applications — and then the real challenges surface, including the following:

- Integration platforms historically too complex for LOB application development and collaboration.
- Lack of awareness of installed SaaS application(s) from the PaaS layer.
- Lack of integration with on-premises applications or Active Directory to synchronize user accounts and entitlements for application onboarding.
- Lack of expertise and best practices.
- No preintegration, forcing even common application integrations to be developed from scratch.
- Deployment lock-in, preventing the capability to transition between public and private clouds based on changing business requirements.
- SaaS applications without access or the capability to share data among themselves easily in an integrated environment.

These challenges translate into quantifiable, negative business impacts, including abandoned cloud applications, missed deadlines, security issues, and outright failure to integrate cloud applications.

TIP

To simplify cloud integration, look for a simple and agile integration platform.

Some of the things to look for include the following:

- Prebuilt application integrations so you don't have to start all your integrations from scratch.
- Best practices based on successful integrations achieved by others and that incorporate crowd-sourced insight and experience.
- Connectivity between your SaaS applications and integration platform with a single cloud provider that offers both PaaS and SaaS.
- Simple user experience so all user personas, including LOB teams and IT application developers, can collaborate with integration developers and architects.
- Open deployment options with public, private, and hybrid cloud portability to support ever-changing business and regulatory requirements.

TIP

With Oracle Cloud Platform for Integration, organizations can jump right in and integrate with nothing more than knowledge about the applications. You don't have to be an integration expert.

Products in the Oracle Cloud Platform for Integration include the following:

- **Oracle Integration Cloud Service:** Simplify integration among cloud and on-premises Oracle and third-party applications. Includes features such as prebuilt integrations and embedded best-practice recommendations that provide an entirely new application integration experience.
- **Oracle API Platform Cloud Service:** Develop APIs in a secure, agile environment, all while keeping an eye on key performance indicators for every aspect of the lifecycle. Allows organizations to rapidly deploy a security layer to existing API-driven applications.
- **Oracle SOA (service-oriented architecture) Cloud Service:** Consolidate diverse integration requirements into a developer solution including application integration, process orchestration, service virtualization, high volume event processing, Managed File Transfer (MFT), business-to-business (B2B), and more. And get all of it in Oracle Cloud without the need for installation. Oracle SOA Cloud Service is identical to Oracle SOA Suite, allowing for integration between cloud and on-premises to support rapidly changing business requirements.
- **Oracle GoldenGate Cloud Service:** Delivers seamless data movement from various on-premises relational databases to databases in the cloud with sub-second

latency, while maintaining data consistency and offering fault tolerance and resiliency.

- **Oracle Data Integrator Cloud Service (ODICS):** Makes all data available for business decision making. ODICS provides a service that brings data access, data transformation, and delivery from and to varied systems and technology, helping businesses use the data deluge to their advantage. It also provides business continuity and a uniform development interface for complex technology without loss of productivity.
- **Oracle Internet of Things (IoT) Cloud Service:** Rapidly assimilate IoT into your digital strategy and create innovative services with intelligent real-time data analytics on large volumes of streamed IoT data and integration to enterprise applications and processes.

Oracle Cloud Platform for Analytics

When it comes to analytics, every organization is trying to use more data to drive deeper insights, more quickly, for more people, with less IT intervention, and at lower costs.

TIP

To meet these goals, you need a robust platform that supports the entire analytic process with the security, flexibility, and reliability that you expect. Long gone are the days when *analytics* referred to static, embedded reports and charts. Today, an analytics platform must not only deliver traditional reports and dashboards, but also the complete set of capabilities for self-service data preparation, visualization, and discovery, whether from a browser or mobile application.

The platform must be quick to provision and easy to administer — yet, it has to offer managed self-service so you can empower your users to do their own analyses without sacrificing governance.

In today's big data world of self-learning programs and artificial intelligence, unrestrained data exploration, rapid analytic application prototyping, and switching are key for implementing the concepts of a *data lab* (for testing and prototyping new analytic and discovery applications), and a *data factory* (for operationalizing analytic applications).

But how can you gain the benefits of a proven enterprise-class system without enterprise-class costs and infrastructure? The cloud gives you the power of the enterprise, without the infrastructure or maintenance burden, for a predictable cost, whether fixed or variable, based on your cyclical needs.

TIP

Instead of spending your time worrying about upgrades or wondering if your analytics platform will perform at the end of the quarter, you can use your time better if you have a top-quality analytics solution.

When your analytics are in the cloud, you want the best: end-to-end solution that can span across on-premises to applications in the cloud and is capable of generating analytics in seconds to enable faster and smarter business decisions.

You need a PaaS analytics solution to do the following:

- **Present the story.** Visually sharing the story behind your data should take just a few easy steps starting from rich, self-blended data from any corporate or external source. The experience should be as simple as combining the data you need and letting the system automatically recommend the best way to represent it graphically from a gallery of dynamic visualizations, or selecting the one you want.
- **Make data free and governed.** No compromise. Most users want unrestrained access to our data at any time, but some other data sources require curation and governance. A true analytics cloud platform allows you to establish a data pipeline, and make it easy for anyone to manage and blend their data, but also allows IT to manage and

enhance other data by using easy tools to review and adjust connections and create flows, whether the source is in the cloud, on-premises, Internet of Things, or any device.

- **Make it mobile.** Just as analytics have evolved to be fully dynamic, they have also moved beyond the desktop. Fully functional analysis on any device is the "new normal." This means that your business intelligence (BI) platform must include a seamless solution for mobile device access.

In this way, a cloud analytics platform will help organizations understand and uncover insights from any data to build optimized business models, thereby transforming data into an asset.

Products in the Oracle Cloud Platform for Business Analytics include the following:

- **Oracle Data Visualization Cloud Service:** Provides a self-service environment for quickly and intuitively visualizing and analyzing any data.
- **Oracle Business Intelligence Cloud Service:** Delivers a proven platform for powerful business intelligence applications, empowering users from the workgroup to the enterprise.
- **Oracle Big Data Discovery Cloud Service:** Provides a single, easy-to-use product, built natively on Hadoop,

to transform raw data into business insight in minutes, without the need to learn complex products or rely on highly skilled resources.

- **Oracle Big Data Preparation Cloud Service:** See the section "Oracle Cloud Platform for Data Management," earlier in this chapter.
- **Oracle Internet of Things (IoT) Cloud Service:** See the previous section "Oracle Cloud Platform for Integration."

Oracle Cloud Platform for Mobile

Oracle Cloud Platform for Mobile is designed to help build better apps faster by providing the platform, tools, and services that help various stakeholders on any mobile project. With a cloud-based platform, mobile client and back-end service developers can collaborate effortlessly in an environment that is tailored to their needs, while managers can fine-tune access and gain insight through mobile analytics.

Oracle Cloud Platform for Mobile capabilities include the following:

- **API first strategy:** Free mobile client developers from the complexity of connecting to unfamiliar

backend systems by simplifying access with a cloud-based, mobile-ready API catalog.

- **Built in mobile services:** Most apps tend to share similar use cases that apply to most applications. Oracle Cloud Platform for Mobile includes commonly used mobile services such as storage, data offline and sync, push notification, user management, and location services, to help developers build better apps faster.
- **Mobile-ready backend services:** Extend new and existing backend systems by shaping and publishing web services as mobile-ready RESTful APIs and publish/share them in an API catalog that client developers browse, access, and use.
- **Mobile analytics:** Monitor, measure, and optimize the performance of mobile application deployments to improve future revisions.
- **Accelerate mobile development:** Get ready for the growing trend toward developing apps without writing any code. Given the high demand for mobile apps, Oracle Cloud Platform for Mobile can help you quickly build and deploy apps for iOS and Android.

Products in the Oracle Cloud Platform for Mobile include the following:

- **Oracle Mobile Cloud Service (MCS):** A Mobile Backend as a Service (MBaaS) that provides built-in

mobile services and an extensible API catalog that help simplify connectivity between mobile clients and backend systems. MCS is based on Node.JS, with tools and services to consume web services and shape them into mobile-ready APIs that can be used by the mobile development team. MCS includes built-in mobile analytics and dashboards to measure and monitor mobile application use and performance.

- **Oracle Mobile Application Accelerator (MAX):** A rapid mobile app development environment that helps users build and deploy mobile applications without writing any code. By using prebuilt, commonly used interface patterns and components, business users can leverage templates and a drag-and-drop wizard based approach to build mobile apps that connect to backend systems. Oracle MAX is a feature of Oracle MCS.

- **Oracle JavaScript Extension Toolkit (JET):** Empowers developers by providing a modular open-source toolkit based on popular open source frameworks (such as JQuery, Knockout, and Require.JS) along with Oracle's own contributed libraries that enhance accessibility, security, offline sync capabilities, enterprise mobility management (EMM) support, and other services.

- **Oracle Mobile Application Framework (MAF):** A hybrid mobile framework that enables developers

to rapidly develop single-source applications and deploy to Apple iOS, Google Android, and Microsoft Windows 10 platforms. Oracle MAF leverages Java, HTML5, and JavaScript to deliver a complete Model-View-Controller (MVC) framework with declarative user interface definition, device features integration, and built-in security, and maximizes code reuse resulting in faster development of mobile applications.

REMEMBER

The Oracle Cloud Platform for Mobile includes Oracle Mobile Cloud Service (MCS), Oracle Mobile Application Accelerator (MAX), and Oracle Mobile Application Framework (MAF), which make mobile app development and integration quick, secure, and easy to deploy.

Oracle Cloud Platform for Content and Experience

A digital workplace requires an integrated suite of content and experience solutions that enable business users to easily collaborate anywhere, simplify business automation, and communicate more effectively.

A holistic PaaS solution for content and experience enables the following:

- **Increased productivity:** Drive better decisions through frictionless yet secure information exchange, social collaboration, and mobility.
- **Increased efficiency:** Enable faster decision making, streamlined and simplified process automation, reduced cost of operations, and improved work effectiveness with contextual collaboration.
- **Rapid innovation:** Deliver new products and services to market faster and create compelling communications and engagement.

Look for a comprehensive cloud-based content and experience solution that:

- **Optimizes existing investments:** Easily integrates with current on-premises and SaaS applications and extends current enterprise content management, business processes, and applications without creating new information and governance silos.
- **Empowers business users:** Drives content collaboration, business process automation, and effective communications without coding or IT customization.
- **Contains inherent security and compliance:** Provides granular security controls for information at rest, in transit, and at access points, even on mobile

devices. Ensure presence of global, secure data centers for data residency and other regulatory compliance.

Products in the Oracle Cloud Platform for Content and Experience include

- **Oracle Documents Cloud Service:** Provides enterprise level content and social collaboration in the cloud with robust security, application integration, and mobile capabilities.
- **Oracle Process Cloud Service:** Model business processes and decisions, design forms, and implement and deploy process applications in a collaborative cloud environment.
- **Oracle Sites Cloud Service:** Business users can build their own microsites on the fly with new content, and incorporate existing enterprise content, processes, and social apps, all within a single integrated user interface.

Oracle Cloud Platform for Systems Management

Designed for today's complex IT environments, Oracle Cloud Platform for Systems Management helps you

manage technology anywhere it is deployed. You can achieve greater control and higher stability for on-premises custom or packaged applications, while reducing the cost of providing high service levels, and leverage the agility and automation of Oracle Cloud Platform for Systems Management to manage rapidly changing web and mobile applications.

By taking advantage of Oracle Cloud Platform for Systems Management, you can:

- Maintain visibility across rapidly changing, cutting-edge, cloud-native microservices or cross-cloud applications.
- Prevent outages across the entire application portfolio.
- Use built-in analytics dashboards to conduct capacity planning across your IT estate.

Built on a unified data platform, source data can include structured and unstructured machine data such as metrics and logs. Powerful machine learning algorithms are applied automatically across the entire dataset to create out-of-the-box dashboards with insights into the performance and health of your IT environment.

As a pillar of the expanding Oracle Cloud Platform services, Oracle Cloud Platform for Systems Management is designed to work in any IT organization — not just Oracle shops. Any organization that needs to manage a complex or rapidly changing application environment will find Oracle Cloud Platform for Systems Management to be broadly applicable. Oracle Cloud Platform for Systems Management provides a comprehensive suite of preintegrated services that can be consumed independently, but become exponentially more powerful when used together. These services include:

- **Oracle Application Performance Monitoring Cloud Service:** Integrates user experience monitoring and application metrics with log data analytics so you can rapidly isolate, triage, and diagnose issues from a single user interface — often before customers are aware of them.
- **Oracle Log Analytics Cloud Service:** Stores and correlates machine data, allowing you to quickly and intuitively analyze billions of log entries using machine learning.
- **Oracle IT Analytics Cloud Service:** Allows you to conduct data-driven capacity planning and assess the performance of your applications and infrastructure estate using a year of historical data.
- **Oracle Infrastructure Monitoring Cloud Service:** Allows you to monitor your entire IT infrastructure from a single unified platform.

- **Oracle Compliance Cloud Service:** Allows you to manage changes and control configurations including industry standard and custom compliance evaluations and reports.
- **Oracle Orchestration Cloud Service:** Enables automated actions based on intelligent findings.
- **Oracle Security Monitoring and Analytics Cloud Service:** Leverages the full array of Oracle Cloud Platform for Systems Management data and threat feeds to detect anomalies and identify weaknesses with policy-based remediation, resulting in continually hardened systems.


TIP

These services help businesses keep customers and internal users happy by resolving issues more quickly, as well as enabling IT to run more efficiently. Offering a massively scalable platform in the cloud supports companies with small and large environments, and Oracle Cloud Platform for Systems Management complements existing on-premises tools, like Oracle Enterprise Manager.

Oracle Cloud at Customer

Oracle Cloud at Customer brings Oracle Cloud to your data centers, providing the same cloud platform and infrastructure services on-premises. This gives you

complete control over data residency, governance, and sovereignty, while providing you with a flexible subscription model that is fully managed by Oracle.

Oracle Cloud at Customer can be particularly useful for highly regulated industries, such as financial services, healthcare, and the public sector, which need to comply with data sovereignty, data residency, and other data protection requirements. These customers may need complete isolation of their infrastructure to comply with security frameworks, such as Sarbanes-Oxley (SOX) and the Health Insurance Portability and Accountability Act (HIPAA).

Additionally, customers want control. They may need to maintain full control of their data, as well as their systems. Customers want to use their own firewalls and load balancers, and may need to meet specific service-level agreement (SLA) guarantees for their customers.

REMEMBER

This approach addresses those businesses that have data residency and compliance issues, while allowing them to leverage the agility and cost savings features of a cloud implementation.

IN THIS CHAPTER

- Developing and testing new apps in the cloud
- Making SaaS and PaaS work together seamlessly
- Analyzing data to drive innovation
- Testing software upgrades

Chapter 4
Oracle Cloud Platform Success Stories

In this chapter, you examine a small sampling of Oracle Cloud Platform customer success stories and learn how PaaS is helping them accelerate innovation, lower IT costs, drive productivity, and increase business insight.

Magrabi Optical — Developing and Testing New Apps

Magrabi Optical is a large optical retail company in the Middle East and North Africa. Recently, Magrabi started using Oracle Database and Java Cloud Services for development and testing, which enabled it to do business faster and at a lower cost.

Challenges

- New hardware took about two months to deploy on-premises and could be held up in customs for days or weeks.
- Applications installed on-premises in a country would go down if there was a problem in that country.

Solutions

- Oracle Database
- Oracle Java Cloud Services

Results

- New environment can be provisioned in the cloud in as little as 30 minutes.
- Hosting in the cloud is safer and lower cost than on-premises.
- Cloud solutions can be easily scaled up and down as business needs change.

Avaya — Extending and Integrating SaaS with PaaS

Avaya is a global provider of solutions for customer and team engagement. The company provides technologies for unified communications and collaboration, contact center and customer experience management, and networking. It also offers related services to large enterprises, midmarket companies, small businesses, and government organizations around the world. Avaya has an intricate sales and service model in which the bulk of its sales depend on its channel of more than 20,000 worldwide partners.

Challenges

Avaya needed to address the needs of its midmarket segment while replacing an existing cloud-based customer

relationship management (CRM) solution with the Oracle Sales Cloud. At the same time, its enterprise partner business required particular functionality that wasn't included in the Oracle Sales Cloud/PRM (Partner Relationship Management) solution. Avaya needed the capability to build custom application extensions to complement the functionality in the Oracle Sales Cloud. In addition, Avaya needed an easy, cost-effective way to integrate the Oracle Sales Cloud with other enterprise applications.

Solutions

Avaya chose to address the challenges with the following Oracle Cloud services:

- Oracle Java Cloud Service-SaaS Extension
- Oracle Cloud Integration Service
- Oracle Sales Cloud Service

Results

For its extension platform, Avaya selected Oracle Java Cloud-SaaS Extension as a way to build additional functionality without making significant changes to the core Oracle PRM application. Avaya also chose Oracle Cloud Integration Service as its cloud integration platform for integrating Oracle Sales Cloud with its other

enterprise applications, including an on-premises SAP implementation.

"With the Oracle Cloud solution, integrated with our own engagement solutions, we expect to take our partner experience to the next level while reducing about 80 percent of customizations and 30 percent of ongoing costs," said Fari Ebrahimi, Senior Vice President and Global Chief Information Officer, Avaya.

SoftBank — Analyzing Business Data

The small, quiet island of Teshima in Japan's Inland Sea has become the proving ground for a new business model for energy distribution as well as remote analytics and telemetry, used to ensure that tourists visiting a popular international art festival don't get stranded on the remote island.

Teshima, accessible only via a 30- to 45-minute ferry ride, is ideal for day trips but public transportation on the island is limited. SoftBank, a Japanese telecommunications and technology company, and PS Solutions, a subsidiary of SoftBank, recently launched an eco-friendly electric motorcycle sharing service called Setouchi Karen. The service lets visitors rent electric scooters, which are rechargeable, and connected to the Internet of Things.

Challenges

SoftBank wanted to develop a model for how various energy providers (in some cases, private citizens) can set and adjust rates based on user needs. That model found an application in Ubiden, a smart-grid transaction engine that can adjust the cost of the energy based on the use of the appliance plugged into the system.

SoftBank hopes to extend the program to local home and business owners, so they can provide their electric power to scooter drivers looking for a recharge. Ubiden would serve as a broker for the transaction, providing a point-of-sale system that measures and charges a rate for the power used.

The electric scooters run approximately 30 kilometers before they need a 20-minute recharge, so Teshima's small size made the island a perfect location for the pilot. The plan was environmentally friendly, more economical than building gas stations on the island to fuel gas-powered scooters, and a great way to get around.

However, if visitors get stuck on the island, they're in trouble. Ferries run only a few times a day, and lodging is very limited. Thus, scooter riders needed to receive an alert if they were running out of charge, so they wouldn't find themselves stranded in a remote part of the island.

Solutions

SoftBank needed an Internet of Things platform that would connect the scooters to a central system that collected, displayed, and analyzed driving data, location information, and power consumption in real-time. The Oracle IoT Cloud platform integrates all this information and provides predictive analytics as well.

The IoT system's two-way communications technology connects with the scooters every few seconds to gather information on their location and battery usage. If the battery is running low, the operator can see the warning from the system so that the operator can do the action.

The scooters put the predictive functionality of the Oracle IoT Cloud to use in a unique way. Some riders may want to go to several sightseeing spots without considering the remaining battery of the scooter. Oracle IoT Cloud identifies the scooters that are being operated in this manner and flags the riders who may have difficulty getting back to the battery station.

Results

Ultimately, SoftBank would like to expand this startup to other locations where pollution is a concern and where building a formal infrastructure to charge the EVs is cost-prohibitive.

Flexagon — Sandboxing for Testing Platform Upgrades

Flexagon delivers DevOps and application release automation solutions that help organizations automate the software delivery lifecycle and improve the productivity and quality of software development. Using Flexagon solutions, including FlexDeploy, organizations can deliver their software faster, reduce costs, improve quality and agility, and drive value to their business.

Challenges

- Maximize resources focused on software development, Flexagon's core business, as opposed to infrastructure management to drive greater innovation and faster time to market for new DevOps and application release automation solutions and capabilities
- Give the firm's software developer customers the ability to quickly ramp up or tear down environments to accelerate their software projects and reduce costs
- Pivot effectively to the cloud to satisfy customer demand for faster software development innovation

- Accelerate the evaluation and sales cycle for FlexDeploy, the company's flagship DevOps and continuous delivery solution
- Reduce software development cost and risk

Solutions

Flexagon selected Oracle Infrastructure as a Service (IaaS) and Oracle Platform as a Service (PaaS) to accelerate development, testing, and deployment of its FlexDeploy DevOps and application release automation solution.

Results

- Empowered Flexagon and its software developer customers to accelerate solution delivery, ensure high quality software initiatives, and reduce development and deployment costs and risks with the option to consume FlexDeploy via the cloud.
- Deployed an instance of FlexDeploy in Oracle Java Cloud Service in just 15 minutes when first undertaking certification of the product in the cloud, four times faster than without using Oracle Java Cloud Service.

- Set the stage for faster sales cycles by giving customers the opportunity to more thoroughly and easily evaluate FlexDeploy, thanks to Oracle Compute Cloud Service and Oracle Storage Cloud Service.
- Accelerated ability to add features and enhancements to the FlexDeploy solution, affording a competitive advantage to the software development company.
- Reduced IT complexity and streamlined move from Flexagon's development and testing environments to production thanks to seamless integration between Oracle IaaS and Oracle PaaS solutions, which, in turn, speeds software development and deployment.
- Gave users the flexibility to instantly stand up storage and compute environments in the cloud, provision Oracle WebLogic Server, deploy an application, run a test, and then decommission automatically — paying only for what they use — thanks to Oracle's integrated cloud solutions.

IN THIS CHAPTER

- Build a sustainable strategy
- Invest in flexibility
- Deliver results faster

Chapter 5
Ten Best Practices for PaaS Success

This chapter gives you a few best practices to help you deploy a PaaS solution for your enterprise — and "pass" with flying colors!

Choose an Enterprise-Ready Solution

Enterprises need enterprise capabilities. Meeting service-level agreements (SLAs), risk mitigation, and business continuity are minimum requirements in enterprise computing — and not all cloud technologies are capable. Whether you're using the cloud for a single-user developer platform or running millions of consumer user production systems, cloud computing is the means to upgrade your IT capabilities as well as your professional reputation. Technology stacks must be integrated to be enterprise-ready.


TIP

You must either investigate and certify every component and integration in the cloud stack yourself — or find platforms that have it ready to go.

A ComputerWorld Cloud Computing Survey found that service-level guarantees are rated as important or very important by 82 percent of organizations choosing to run applications in the cloud. Don't assume that your cloud platform will provide the capabilities you require — demand these same capabilities.

Ensure Portability and Interoperability

With many enterprises adopting hybrid and multicloud models, application and data portability and coexistence of cloud and on-premises IT have become essential requirements. Open source and multivendor technology stacks make this flexibility extremely complex, if not impossible.

Just as traditional silo lock-in was a problem to avoid, so it is with cloud platforms as silos. The best enterprise investments are designed to mitigate these types of risks. And as cloud native open source technologies migrate onto the cloud, enterprise level support is needed.


TIP

Oracle apps and data can move between public clouds and on-premises environments — easily and without changing any application configurations, security policies, or virtualization templates.

Anticipate Hybrid Scenarios

To be as agile and efficient as possible, modern systems design should minimize infrastructure dependencies. As systems evolve, price performance, peak performance, networking costs, latency, and service-level agreement

(SLA) objectives may suggest re-platforming in a way that was not anticipated.

Your cloud transition requires an integrated and complete enterprise technology stack in addition to native multiplatform implementation. Outside of interoperable tools and apps, don't forget that large data sets for testing and analytics need to move at high speeds across platforms and data centers.

REMEMBER

The success of the PaaS service layer will be measured by the ease with which you can manage change. The best services support creating a dynamic, hybrid environment.

Choose an Open, Comprehensive, and Integrated PaaS

PaaS should reduce the time and cost of deploying and managing applications — not add to them. Choosing an open PaaS solution with a comprehensive set of fully integrated services will help avoid the complexity among multiple cloud vendor services. With built-in security and single sign-on capabilities, not only should the platform services work seamlessly with each other, but they should also be integrated vertically with the underlying IaaS and with any SaaS applications built to run on them.

Move Development and Testing to PaaS First

Often, the bottleneck in applications development is provisioning resources. There's never enough, they're never the right size, and they're never delivered in a timely manner. Development in the cloud eliminates these problems and the gains can be dramatic. Aside from having resources available, Oracle's data cloning and preparation features, the most time-consuming task in dev, test, and support operations, can also be significantly reduced. In the end, developer productivity improves and costs per bug decrease.

In addition, application development and testing workloads are ideal candidates for early migration to the cloud because they inherently carry lower risk and often only require temporary environments.

TIP

With Oracle Cloud Platform, developers can quickly provision databases as well as every other aspect of the deployment platform, and focus on building and deploying applications with the click of a button, rather than waiting for resources to be provisioned for them or having to provision and manage the underlying infrastructure themselves. Developers can quickly create development environments to simplify and accelerate the entire development life cycle, and then choose to deploy the applications on Oracle Java Cloud Service, Oracle

Container Cloud Service, Oracle Developer Cloud Service, and Oracle Database Cloud Service, or even in house.

Build a Database Foundation

Database administration is easier in the cloud. If your cloud starting point has been nonproduction use cases, such as development and testing, it's time to look again. The state of the art now supports large-scale enterprise workloads in production environments. All Oracle Database options are now available in PaaS, including Real Application Clusters (RAC), partitioning, management, and more, which means that any on-premises database use cases can be supported in the Oracle Cloud. The spectrum of database services enables developers to gain instant access to a fully configured Oracle Database. For database administrators (DBAs), familiar management tools, including automated cloud tooling, provide the same level of control and at the same time make it much easier to manage high-end production workloads for online transaction processing (OLTP) and data warehousing.


TIP

Oracle's Cloud Services cover everything you might need:

- Oracle Database Cloud Service
- Oracle Database Exadata Cloud Service

- Oracle Database Exadata Cloud Machine
- Oracle Database Exadata Express Cloud Service – Managed
- Oracle Database Schema Cloud Service – Managed
- Oracle Database Backup Cloud Service
- Oracle Big Data Cloud Service
- Oracle Management Cloud Services

Based on these cloud services, DBAs still have all the control they need to meet their SLAS with the option of Oracle taking on the mundane administrative burdens of maintenance and management.

Migrate On-Premises Portfolios

Adopting a cloud platform should be a smooth transition. However, migrating an on-premises portfolio to a new platform can be challenging. It involves understanding dependencies, recertifying security policies, and evolving personnel skillsets. A lot of these tasks and risks can be mitigated if you can be assured that your destination is the same as your starting point. To do this, choose a cloud provider with a native environment that matches your own. Doing so will leverage your people, their skills, and your portfolio without you having to rewrite or reconfigure it.


TIP

Oracle Cloud Data Management hybrid design ensures 100 percent compatibility for Oracle Database and Oracle applications, which doesn't require any code changes. Automated migration tools combined with familiar management features to those used for on-premises, make migration easy and seamless.


TIP

Oracle's on-premises tools and technologies are natively supported in the Oracle Cloud. And Oracle's capability to blueprint an entire IaaS landscape (using Ravello), along with its associated PaaS layer, enables a smooth migration to the cloud.

Explore New Technologies

PaaS enables you to easily experiment with technologies that you've perhaps never tried before or have had limited exposure to, such as:

- Big data
- Data management
- Event streaming
- Internet of Things (IoT)
- Data mining

- Machine learning
- Mobility
- Citizen developer tools
- Agile team collaboration tools
- Containers

Quickly spin up a new platform technology to see if it solves a business need or may have some other useful application within the business.

Improve IT Responsiveness

It's important to remember that PaaS is more than a collection of technologies. Rather, PaaS contains the enabling capabilities for everything at the top of the business agenda: business process modernization, customer engagement, deeper analytics, and even risk mitigation.

When it comes to cloud adoption, it isn't surprising that cloud-based development has been so successful. But, the value proposition has shifted from faster provisioning to faster release cycles. PaaS services gave IT the tools to be even more responsive. Now, apps are cloud native, engaging more users than ever, and have become the standard for business as usual. Consequently, expectations for IT have never been higher.

REMEMBER

Don't think of PaaS services as a collection of discrete services. Think of PaaS as a platform at the center of your cloud and hybrid cloud delivery model. As a platform, the services should be integrated and managed consistently. Think architecturally about interoperability, standards, and service integration. Choosing a standards-based and integrated PaaS platform will be critical to your success.

TIP

Many companies buy into cloud strategies, but they have concerns about their data residing in the public cloud or they are too far from a data center for ongoing operations. Oracle Cloud at Customer may be the solution in these cases. It brings Oracle Cloud to *your* data center, thereby eliminating any data sovereignty or governance concerns as well as latency or performance issues – while providing all the value of a subscription-based cloud model.

Complete Projects Faster

Cloud projects tend to move faster not just because investment and technology barriers are removed through rapid provisioning and simplified management, but because the cloud offers a more productive development environment. These characteristics of cloud projects align well with Agile development shops that are defined by swarms of

developers racing to meet rapid and short release sprints and support app development. Other important development characteristics that align well with an integrated IaaS and PaaS cloud strategy include:

- Containers that conveniently package code and dependencies, and consume less run-time resources.
- Accelerated code-release cycles due to integrated cloud native tooling.
- Experimentation with new technologies (see "Explore New Technologies" earlier in this chapter), such as mobile and big data analytics.
- Proliferation of open source solutions with a collaborative community eager to share modern coding techniques, code, and tools.


TIP

As you adopt new tools and techniques, be on the lookout for active communities of interest as well as enterprise support for emerging standards.

Oracle provides enterprise support across a wide variety of development tools, platforms, and processes. Oracle Developer Services include support for:

- Git for source control
- Maven for application dependencies and libraries

- Hudson for continuous build integration
- Maven, Ant, Gradle, npm, Grunt, Gulp, and Bower build frameworks
- Platform support for Docker containers, which in turn enables Mesos and Kubernetes
- Task tracking system with agile project management dashboards and reports
- Team collaboration tools such as code review, wiki, and activity stream

Drive innovation and business transformation in the cloud

This updated edition of *Public PaaS For Dummies* explains how Oracle's PaaS enables organizations to embrace the efficiency, speed of service, and information availability that cloud computing offers. This book also explores key PaaS use cases, describes what to look for in a PaaS solution, examines some real-world PaaS success stories, and reveals best practices to help you succeed with PaaS in your organization!

Inside…

- Understand the benefits of testing platform upgrades in a sandbox
- Discover how you can avoid complexity with an open platform
- Learn how leveraging hybrid environments can elevate your business

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