Simplifying Mobility with Integration

Integrate Mobile Applications to Cloud, Enterprise, and the Internet of Things
Introduction

Mobile computing paradigms are quickly transforming the way businesses operate. Wi-Fi networks are ubiquitous and nearly every business user has at least one mobile device. Mobile usage is on the verge of exceeding desktop usage. The advanced capabilities of smartphones and tablets has opened new opportunities to develop contextual, location-based business models. Nearly every organization is thinking of ways to take advantage of these new mobile technologies.

Mobility is a significant challenge for IT professionals. Capitalizing on this mobile wave requires significant changes to IT and business strategies. It is the top technology priority for today’s CIOs, according to a recent poll by CIO Magazine. The demand for mobile applications continues to grow, with 87 percent of enterprises updating or releasing new mobile applications at least every six months. IT pros spend the majority of their time in these projects connecting new mobile functionality with existing back end systems—and overall spending on mobility is on the rise.

Mobility is A Significant Challenge for IT

![Chart showing the top technology priorities of CIOs, current state of mobility, and the cost of mobility with a graph showing a spending increase.](image-url)
Astute companies leverage their existing investments and development resources to cater to both browser-centric applications and mobile applications. This paper explores the primary ways in which organizations can accomplish this goal as they create, integrate, and deploy mobile applications in conjunction with on-premises and legacy applications.
The Challenge of Mobile Integration

Today’s integration challenges are a function of increasing complexity. The IT landscape is more diverse than ever. Cloud computing models are becoming accepted throughout the enterprise—private, public, and hybrid. As more and more enterprise applications move to the cloud, connecting applications with each other, with users, and with the enterprise systems of record gets more difficult. Fast Data, Big Data, and the Internet of Things (IoT) are adding new layers of complexity to these application deployment scenarios. Both cloud and on-premises applications must interface with new types of devices, data, and contextual information.

In the midst of this complex technology landscape is a rising demand for mobile applications. When properly added to this evolving infrastructure, mobility brings tremendous business value to the enterprise, but it must be done in an efficient and economical way that utilizes existing information systems, IT assets, and the expertise of those who develop and manage these systems.

Selecting the Right Approach for Mobile Integration

As you ponder your organization’s mobile integration strategy, start by asking what you want to offer to customers and how much control you want to have over mobile application development. For example, do you have reliable in-house resources or do you rely on third parties? Depending on your specific IT culture, skills, resources, and time constraints, your organization will most likely gravitate to one of the approaches presented in this paper.

The first three approaches represent “bottom-up” development by starting from the underlying enterprise IT layer:

- **Mobile Service Enablement** – Development organizations that wish to control the entire user experience, from the enterprise applications all the way to the mobile front-end, often favor this approach.

- **API Management** – Application Programming Interface (API) Management enables organizations to selectively externalize their IT assets via standard interfaces made available to mobile application developers.

- **Mobile Backend as a Service (MBAAS)** – This method involves abstracting all common mobile functionality into the cloud, which frees up resources to focus on mobile front-end development and the associated business models for mobile applications.
A fourth approach, called Business Process Management (BPM) for Mobile, takes a top-down approach to business process orchestration by converting human interaction, cases, and workflows to mobile front-ends. This approach is typically suitable for organizations that already have a BPM solution and have already created turnkey business processes.

Let's look more closely at each of these mobile development/deployment options to explore their suitability for various enterprise requirements.

**Mobile Service Enablement**

Mobile service enablement extends service-oriented architecture (SOA) to mobile channels by exposing existing business assets through a mediation layer such as a middleware service bus. This approach enables developers to leverage existing infrastructure for developing on a mobile channel. It is a good fit for companies that don't have a lot of development taking place outside the organization and that already have an existing IT infrastructure in place. There should be sufficient IT resources and expertise to build and maintain the backend functionality required for mobile enablement on top of the SOA foundation. The organization may also have development resources available to build new applications and connect them with existing enterprise assets and infrastructure, such as the security architecture.

Mobile service enablement helps create new channels using existing SOA infrastructure. The infrastructure can be easily leveraged for mobile channels, as shown below.
Case in Point: Jurlique

Consider Jurlique, an Australian manufacturer of natural skincare products that has experienced significant growth in online sales in the U.S. Jurlique needed to automate its online ordering process to cut down transaction processing time and deliver a better service to its customers.

Jurlique built a new Mobile Ordering System and used its existing SOA infrastructure to integrate it with its JD Edwards EnterpriseOne Order Processing module, without the need for custom coding. This approach enabled Jurlique to deploy its new online service in less than six months. The new architecture also improved performance: Jurlique can execute transactions 50 percent faster during peak sales periods and its sales staff can use their mobile devices to process sales orders. SOA has reduced the time it took to complete online product orders by at least 20 percent, and it accelerates delivery times from order to shipment by 50 percent. The new ordering system improves customer service by reducing the weeks of manual processing required to reconcile thousands of daily product orders during peak times.

API Management

Many organizations wish to expose and monetize their valuable IT assets through multiple channels—Web, mobile, and otherwise. They are looking for a fast way to get there. API Management begins by developing a strategy to identify the IT assets that can be exposed externally so the organization can tap into new revenue streams and increase brand awareness.

API Management facilitates the connection of data and business functions across mobile, cloud, and on-premises environments. Today’s developers need integrated API Management solutions that can be deployed on-premises as well as in the cloud. Market leaders often adopt a “mobile-first” mindset when it comes to designing APIs, with an eye to creating mobile application-specific infrastructure to speed time-to-market for new applications.
API Management exposes existing IT assets and services as APIs that can be leveraged by third parties. A complete API management solution can automate a variety of integration scenarios via standard interfaces based on SOAP, REST, B2B, and Managed File Transfer. In addition, it permits lifecycle management of APIs including development, version control, monitoring, management, and end-of-life maintenance of APIs. API Management typically provides tools to foster a developer community including a portal where developers can connect with each other and exchange best practices.

When made available to mobile application developers, an API to enterprise content or functionality has the potential to drive new business value. API Management allows organizations to unlock the potential of their enterprise software assets by using SOA to mask complexity from developers and expose the functions that are needed by end users. APIs decouple business logic from mobile presentation and user experience technologies via standards-based interfaces.

**Case in Point: Türk Telekom Group**

Türk Telekom Group, the leading communication and convergence technology group in Turkey, is continually challenged to adapt services and processes to meet rapidly changing telecommunications market requirements, such as consumer demand for mobile payment systems. These emerging technologies also exert a heavy demand on its legacy systems. In order to integrate these legacy systems with new mobile application development initiatives, Türk Telekom needed to optimize product lifecycle management for hundreds of SOA initiatives.

Türk Telekom used the API Management model to take advantage of third-party development resources, connect with other enterprise applications, and build “mash-ups” and mobile front ends for its mobile payment systems and other new applications. They also established an enterprise repository with a UDDI-compliant service registry. This governance architecture provides a common communication channel that ensures an automated exchange of metadata and service information. This middlelayer provides the visibility, feedback, controls, and analytics to keep Türk Telekom’s SOA development and mobile development initiatives on track. Having aggregate data on SOA assets gives developers a clear picture of which SOA services exist and what the status of each service is so they can align these services with continually shifting business demands.

**Mobile Backend as a Service**

Mobile application development involves creation of backend services that can be abstracted into a middleware layer as a cloud service. This approach, commonly called Mobile Backend as a Service, provides a unified platform for application developers with backend services for push notifications, integration with social networks, user management, and cloud storage that are specific to supporting mobile applications.

Mobile Backend as a Service (MBaaS) exposes enterprise applications as services or APIs for consumption by mobile applications, both on-premises and in the cloud. MBaaS “abstracts” all common mobile functionality into the cloud—such as user authorization and identity management—
freed up developers to focus on mobile application development. This layer of functionality unifies front-end applications with on-premises and cloud-based services via a common API.

With the MBaaS model, developers don’t need to redevelop their own backend services for each application, dramatically simplifying development. For example, they don’t need to be concerned with the underlying details of the communications model or where data will be stored. If they utilize Mobile Backend as a Service, all of these issues are handled for them. Just as important, their applications will inquire inherent portability, scalability, security, and manageability, enabling developers to focus on the business problems at hand.

**Beyond Mobile Backend as a Service**

MBaaS is a new approach that is fast gaining traction among mobile developers. While it may seem like all MBaaS solutions are alike, they are distinguished by the strength of their backend functionality in the following areas:

1. An industrial-strength API implementation.
2. The availability of backend services to expose assets as APIs, such as a document cloud service and an integration cloud service. These backend services make mobile applications much more powerful.
3. Unified monitoring and management, from the backend to the front end. Having detailed analytics that leverage a broad perspective improves the quality and value of mobile applications.
4. A unified security framework that spans front-end and back-end assets.
5. Implementation services that let developers “write once” and run their applications on multiple devices.

**BPM for Mobile Enablement**

Many organizations create, manage, and improve business processes using Business Process Management (BPM) systems. BPM technology helps to automate human workflows that involve people from every level of the organization. It has proven its ability to make these processes more efficient, agile and transparent.

As companies mobile-enable their business processes, BPM technology can make those processes more agile and robust via interaction with front-end forms, automatic page flows, GPS technology, and other services. Mobility adds value to business processes and makes them more dynamic by introducing location data, photos, address books, calendars, and other applications on the mobile devices.
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BPM for Mobile Applications

BPM for mobile enablement allows a top-down approach to mobilizing turnkey business processes using familiar BPM techniques. Business Processes can react based on location and contextual awareness and users can obtain timely responses from participants in the workflow.

Mobile enabling business processes makes it possible to include location and contextual information that affect the flow of those processes. BPM makes it easier to mobile-enabling enterprise processes as well as change the flow of those business processes to improve productivity and ensure the timely interaction of participants.

Case in Point: Choice Hotels International

Choice Hotels International, one of the largest and most successful hotel franchises in the world, is using SOA and BPM to support the growing IT demands of more than 6,100 hotels worldwide in 35 countries. When Choice Hotels needed to replace its homegrown and legacy systems with a more modern IT architecture that accommodates mobile devices and paradigms, they used SOA and BPM to replace dozens of complex systems and hundreds of point-to-point connections. This architectural retooling paved the way for a vast array of new mobile applications, even as it simplified application development, reduced IT costs, and streamlined business processes.

As part of its SOA initiative, Choice Hotels has been able to lower development costs by re-using existing IT investments and assets to launch 19 new services including an enhanced Online Travel Agent interface, Google API, and other innovative solutions. Choice Hotels relies on SOA to dynamically integrate with the Google API as it handles more than 3.7 million data points and 2.1 GB of data per week. This standardized architecture has also streamlined processes by empowering the IT department with the knowledge necessary to meet the rapidly changing demands of its global franchise network.
Solutions from Oracle

Integration is one of the leading challenges of mobile application development. Many Oracle customers have already addressed this challenge through their use of service-oriented architecture (SOA) and business process management (BPM) technology—two fundamental components of Oracle Fusion Middleware.

For example, Oracle Service Bus, part of Oracle SOA Suite 12c, allows developers to easily expose enterprise applications and data as virtual services and enable Web services and RESTful API connections with them. Mobile applications communicate with back-end applications through standard Web services. Oracle Service Bus supports all types of connections between applications on mobile devices and back end business systems including Representational State Transfer (REST) and JavaScript Object Notation (JSON), two immensely popular protocols. Developers can leverage their existing application and integration infrastructure as part of a highly reusable and scalable development and integration platform.

The front-end in these projects often consists of custom applications built on mobile devices, perhaps using the Oracle Mobile Application Framework. Mobile applications communicate through Oracle Service Bus via a standardized mediation and virtualization layer.

Oracle SOA Suite has offerings for mobile-enablement and API management that address many customer strategies. An integral part of Oracle Mobile Platform, Oracle SOA Suite helps organizations address all types of mobile integration challenges for applications that reside on premises or in the cloud. By leveraging Oracle SOA Suite in conjunction with Oracle BPM Suite, customers can simplify application development, reduce IT costs, and streamline business processes.

In addition, Oracle API Gateway acts as a control point for managing how internal users and application assets are exposed, reducing security risks. Oracle API Management uniquely manages both the internal and external lifecycles of the APIs by:

• Providing a complete lifecycle management solution, including definition, creation, security, monitoring, and management

• Enabling developers to expose APIs through REST/JSON, the predominant API models for both web and mobile applications.

• Providing opportunities to grow and enrich developer communities with pre-built, customizable portals

• Delivering proven, trusted API management solutions

Oracle provides a complete solution for mobile integration that satisfies many customer needs. For example, MBaaS involves exposing existing business assets as services through a mediation layer such as Oracle Service Bus and building a mobile front-end using Oracle ADF Mobile. Developers can leverage Oracle Enterprise Manager and SOA Management Pack to manage mobile services for the mobile channel in the same way they would for any other channel, ensuring good performance and
availability. Few vendors offer such a complete gamut of mobile-development and mobile-enablement solutions. For more information, please visit:

oracle.com/mobile
oracle.com/us/products/middleware/soa/resources/index.html
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