



MICROS SYSTEMS, INC.

Headquartered in Columbia,
Maryland

[HTTP://WWW.MICROS.COM](http://www.micros.com)

Industry: Hospitality & Retail

Oracle Products & Services:

- Oracle JDeveloper / Oracle ADF 11g
- ADF Faces Rich Client Components
- ADF Task Flows
- ADF Business Components
- Oracle WebCenter
- Oracle SOA Suite
- Oracle Access Manager
- Oracle WebLogic Server
- Oracle Enterprise Manager and Packs
- Oracle Forms & Reports

Related Software

- Oracle Database 11gR2
- Oracle Real Application Clusters (RAC)
- Oracle Linux
- Oracle Business Intelligence EE Plus
- Subversion
- Hudson Continuous Integration

Project Scale:

- 583 pages
- 778 task flows
- 4175 ADF BC Objects
- 2 SOA Processes (includes a mediator, BPEL process and a Human Task)
- 38 task flow based portlets plus worklist portlets
- 110 ADF libraries

MICROS SYSTEMS, INC.

“Oracle ADF has allowed us to rapidly develop a rich and compelling User Interface that is so intuitive to our hotel enterprise employees that very little training was required.” – Boro Petrovic, CTO, Micros Systems Inc.

Executive Summary

For over 15 years, MICROS - an OPN Platinum partner - has been working closely with Oracle, applying industry best practices in the development of their solutions. Their current application suite for the hospitality industry, OPERA 5, was built on Oracle Forms and the Oracle database running on MS Windows. The next generation of this suite, OPERA 9, is being developed and released in modules that are now based on the newer Oracle Fusion Middleware (FMW) 11g technologies, Oracle Database 11g, and will run on Oracle Linux.

Their primary driver for change was a need for modernization of their legacy systems both from a User Interface (UI) and a Service Oriented Architecture (SOA) perspective. MICROS leveraged Oracle ADF for providing a rich UI for their business processes that could be served up either through traditional methods or through mobile devices globally. From a SOA perspective, MICROS saw a need for agility based on dynamic business requirements and so leveraged Oracle's SOA Suite to provide loosely-coupled services that could evolve without impact to other services.

Organization

Beyond being the only full systems solutions provider for all market segments within the hospitality and specialty retail industries, MICROS is also the industry leader in providing cloud services in their data centers throughout the globe. They have a global distribution and service network in place for major chains, regional chains, local independents, table service, and the quick services market.

The Business Issue

The business processes of global hotel chains are a prime example of worldwide distributed operations. A hotel can be located on one continent, the guest may be on another continent, and the sales agent could be on a third continent. In such scenarios, SOA and cloud-based enterprise Information Technology (IT) solutions can substantially improve operational efficiencies and guest services, while at the same time cutting the total cost of IT. With this in mind, Oracle Fusion Middleware technologies were selected for MICROS's "next generation" leading edge hospitality software.

Maintaining a leadership position demands that OPERA continuously evolve to take advantage of technological advances and to adapt to the changing needs of the hospitality industry. This is the thrust behind the OPERA 9 development project. Today's global business and technological environment underlies current initiatives to redesign OPERA's technology stack and architecture to keep it in the forefront among hospitality software products. Some of these change drivers include the need to:

- Create an intuitive and easy-to-learn user interface that will significantly reduce the time needed to train ever-changing hotel personnel
- Become more latency tolerant, lowering response times for requests
- Respond to requests for an even more natively open architecture (i.e. an architecture that has been created from the ground-up providing smooth functionality from a system designed for full integration).
- Customize to the individual brand's and hotel's needs
- Integrate OPERA with any SOA based system used by the hotel or brand to create a single, transparent user interface
- Support localizations (languages, local legal requirements, etc)
- Support Web 2.0/3.0 interactive information sharing
- Enhance business processes by modernized application user interface (UI) that can be served globally, used on mobile devices and support the workflow and collaboration
- Enable agility by building applications on SOA and allowing loosely coupled components to change/evolve independently of one another

- 2000 database tables
- 1700 PL/SQL packages
- 14 Enterprise Archives
- 20 Developers
- 3 Product Experts
- 2 QA Staff
- 1 Documentation Expert
- 1 Project Director

Challenge/Solution

MICROS had begun evolving their legacy system into a modern solution with a feature-rich, attractive, Oracle ADF-based UI that is loosely-coupled with services, which can be distributed via the cloud.

One of the biggest challenges for Micros was how to leverage their existing Oracle Forms-based solution while at the same time taking on the modernization effort. This was accomplished through the innovative use of Oracle FMW technologies. The MICROS R&D team created an architecture that leveraged the 1000+ man years invested in their Oracle Forms-based solution, which was already in widespread production use. Thus, their legacy system was not a throw-away but instead became an integration effort with the newer technologies provided by Oracle FMW including Oracle's ADF.

Return on Investment (ROI) in migration of Oracle Forms applications to ADF applications comes from re-engineering business processes using new application features / functionality based on ADF Business Components, ADF Task Flows, and ADF Faces Rich Client Components that are more efficient and provide for rapid adoption by users due to rich experience and ease of use. MICROS is migrating Oracle Forms modules by business processes (i.e. Hotel Reservation Booking process; Guest Check-In / Check-Out process; etc.). Within one business process it is either an all-Forms solution or it is an all-ADF solution. Each process is launched independently from within the WebCenter Portal dashboard. Forms modules run in a separate window and are launched from a common WebCenter dashboard via menu items that are linked to the servlet.

MICROS IT has been heavily invested in Oracle Forms for many years now so at first glance it might seem a daunting effort to bring them into the newer JEE development model. What was discovered was quite different. The Forms developers at Micros were able to learn ADF very quickly, through on-line training, ADF collateral on Oracle's Technology Network, and through the assistance of Oracle's Worldwide Alliances and Channels teams. The essence of this was that ADF's wizard-driven and declarative nature provided a quick path for Forms developers to become productive developing JEE applications.

One of the key strengths of the Forms developers at MICROS is in the subject matter expertise and intimate knowledge of the back-end PL/SQL API's as well as the data model. It was easy to add additional talent with experience in designing attractive HTML based UI's. With this combination, MICROS then followed a design-pattern-based development approach where a couple of advanced developers would design a pattern for solving a particular problem (or defining a particular UI style), which was then shared with the rest of the development team to use.

Project Description/Solution Uniqueness

Built on an Oracle database and initially developed using Oracle Forms, OPERA transitioned from a client-server application to a full web client enabling full use of today's communication network advantages. Currently, close to 50% of all new OPERA installations are hosted from one of MICROS's data centers, a trend that continues to accelerate. This smooth evolution exemplifies OPERA's ability to respond to market trends and product requirements without the customer having to re-invest in infrastructure, software and hardware.

OPERA 9 will gradually convert the OPERA 5 product to an all inclusive Oracle ADF solution that will deliver functionality through web services. Building the application around web services lays the groundwork for tighter integration between OPERA and the hotels' SOA environments and the third-party applications MICROS's customers are using. OPERA 9, offered for either SaaS or on-premise implementation, initially provides features that complement and work with current OPERA applications and that utilize the current OPERA database structure. Services include managing distribution of hotel room availability and rates to channels such as Hotel Web-sites, Expedia, etc. One of the modules is for channel-management and another is for Hotel Reservations.

Credits:

Boro Petrovic – Micros, CTO

Grant Gustafson – Oracle, WWAC

Dana Singletery – Oracle, ADF PM

The Big Picture: ADF, WebCenter, SOA Suite

There's a lot of technical detail to follow and the key is in the technologies used and the ease of integration between them. This is not just an ADF solution but one that is more complete with the addition of Oracle Fusion Middleware. As you'll see, ADF, SOA Suite, & WebCenter integrate seamlessly with one another thus complementing each other and providing for an even richer and more agile architecture.

This new model adopted by Micros has been designed in the form of XML schemas and Web Services. These web services are implemented with a top-down approach and utilize the ADF Business Components that calls existing back-end PL/SQL API's in addition to regular database access. The web services are deployed on a dedicated Oracle WebLogic Server and are transactional but stateless. The UI modules interoperate with the web services through JAX WS 2.1 and the ADF BC layer is bound to the web service proxy client. The UI components and data controls are bound to ADF BCs through the standard ADF data binding layer.

Micros's next generation solution, OPERA 9, uses Oracle's SOA Suite primarily to orchestrate Human Workflow processes. The workflow is designed to initiate from the ADF BC code using proxy classes generated from exposed SOA composite web services. The Mediator component has been utilized to transform the payload and initiate the Business Process Execution Language (BPEL) process that ultimately passes the payload to the Human Task. This payload has been presented as an ADF Faces page to the user using Human-Task data control binding. The worklist is presented to the user on the WebCenter Composer page as a portlet based on the user authentication information passed as a Security Assertion Markup Language (SAML) security token form ADF security.

The majority of the business application portlets have been published from ADF Faces Task Flows generated using WebCenter portlet libraries. In addition, out-of-the-box worklist portlets are actively being used.

One of the many unique characteristics of this solution is the innovative use of Oracle FMW to support an enterprise solution that supports all localizations (such as languages, local legal requirements, etc.) and can be deployed globally in the form of distributed services. Services that can be virtualized allowing customers the choice of different providers. This is accomplished in ADF through the use of resource-bundles for each supported locale. In addition to this, the rich set of ADF Faces components has been utilized to provide a very rich UI that is intuitive to use for the hotel employees and provides ADA compliance, internationalization, translation, mobility, as well as gesture touch on tablets for graph data visualization components and data grid scrolling all out-of-the-box functionality provided by ADF.

Another aspect of the solution's uniqueness is the use of the surround – erode concept to enable evolution of the application. Existing Forms modules co-exist with new ADF based modules. Legacy backend code utilized for the web-services implementation can be changed without impact on the loosely coupled UI tier.

Looking towards the future with their OPERA 9 solution is the use of Oracle Metadata Services (MDS). Among the biggest benefits of metadata-driven applications that use MDS are the easy and upgrade-safe mechanisms for tailoring or shaping the application logic represented by the metadata – such changes are called customizations and are performed during application runtime. OPERA 5 (Forms-based) Application Modules are used by over 20,000 hotels worldwide, which would not be possible without the ability to customize the application. The Forms customization is based on “flex items” and stub pre-linked libraries (pll) libraries, which are limited and have created extra work when upgrading the application. Currently released OPERA 9 modules contain limited use of MDS at present. The full use of MDS, with multi-layered customization using Oracle WebCenter Composer, is planned for upcoming builds within the year.

Business Value

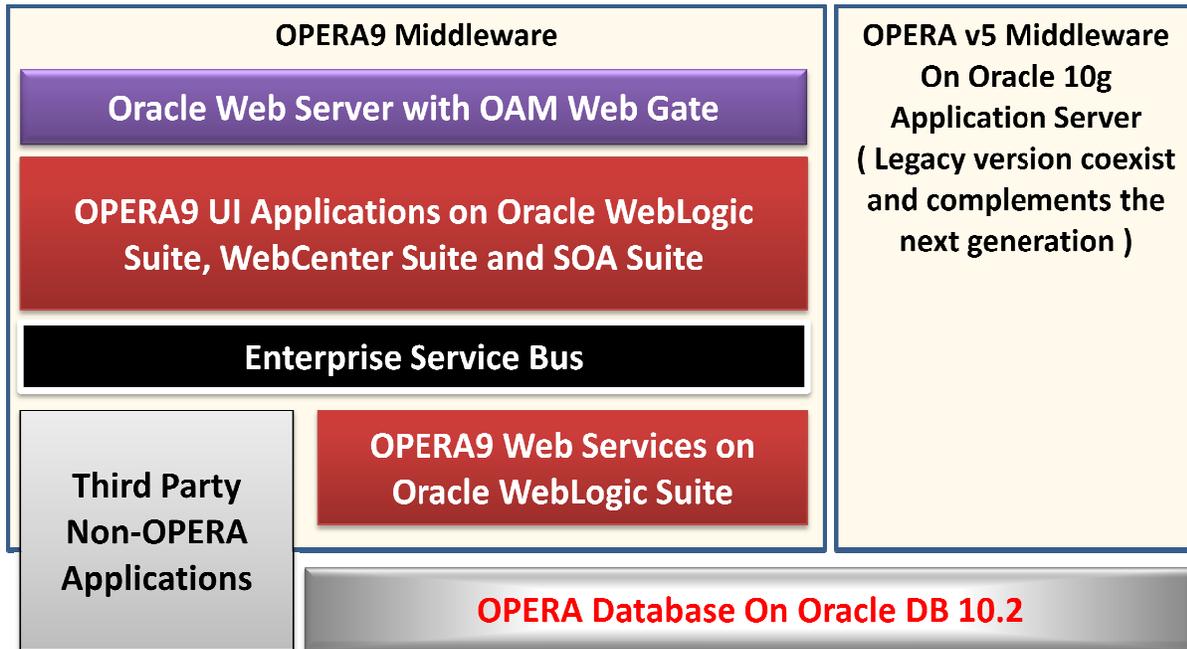
Short Term:

- Enhanced multi-channel user interface served up through traditional methods or through mobile devices
- Improved application performance when accessed over networks with higher latency
- Enhanced business processes & flexibility
- Reduced training time

Long term:

- Improved agility through SOA
- Improved development productivity

Architecture: Micros's application architecture for their next generation, Opera 9, product offering leveraging Oracle WebLogic Suite WebCenter Suite, SOA Suite and Enterprise Service Bus.



Application View: Look-To-Book Sales Screen allowing agents to book rooms for their guest. This is a dashboard style of layout with search functionality and customizations enabled.

Opera 9 Beta

NAPLES - Naples Central Reservation Office

Thursday, 03 May, 2012
TSANDS

Look To Book Sales Screen

Caller Information Edit
Sands, Trevor
tsands@micros.com

Sell Messages - DEMO ?
Agent with Highest Conversion Rate today gets a prize! 1/1

Room Types	STTD	STDK	M2CAB	M4CAB	DBL2
Stay Availability	47	88	5	12	0

[Hide Availability](#)

Search properties for...

Single Rate | Multi Rate

Property: DEMO

City:

Arrival: 03-05-2011 | Nights: 1

Departure: 04-05-2011 | Rooms: 1

Adults: 1 | Children: 0

Guest Options | Search Options

Name: Sands, Trevor, Mr

Membership No.:

[Search](#)

Available Properties

DEMO - Opera Demo Hotel, Small
Naples, FL, US
Availability: 152 / 155
Initial Display Set

BESTAVAILABLE

1	308.00	310.00	425.00	299.00
	STTD	STDK	M2CAB	M4CAB
	BAR3	BAR3	BAR3	BAR3

299.00 - 425.00 USD

[No Display Set](#)

[RACK](#)

[PACKAGES](#)

[BAR](#)

Trip Composer

DEMO Remove Edit

Arrival: 03-05-2012
Nights: 1
Departure: 04-05-2012
Rooms: 1 M4CAB
Guests: 1 + 0
Rate Code: BAR3
Rate: 299.00 USD

Est. Grand Total: **299.00 USD**

[Book Now](#) [End Call](#)

Call Statistics

Reservation Time: 00:04:27

Total Reservation Time
Average Reservation Time
Total Calls: 1
Total Reservations: 0
Total Revenue: 0.00

Room & Rate Information

M4CAB - M4 Cabin

4 bedroom cabins, complete with a living room, wood burning fireplace, full kitchen, bath, and stately bedroom. Cabins overlook one of three Championship Golf Courses.

BAR3 - Best Available Rate Level 3

My Favorites

V9.0.0.33.02

Application View: Reservation Presentation Screen with a dashboard layout where the results of bookings are displayed. Reservation Management features are provided as well as additional functionality such as Guest Messages, Alerts, etc...

Opera 9 Beta NAPLES - Naples Central Reservation Office Thursday, 03 May, 2012
TSANDS
Dashboard Application Administration Logout Help

Client Relations | Bookings | Inventory | Miscellaneous | Menu Search... | Quick Links

Manage Reservation

I want to...

- Cancel Reservation
- Check-In
- Copy Reservation
- Move to Another Property

... More

Additional Stay Details

Alerts 1 Total

Associated Profiles

Call History

Changes Log

Confirmations

Deposit / Cancellation 1 Total

Guest Messages

Membership 1 Total

Notification

ALERTS Guest has package at the Front Desk 1/1 X

Primary Details - DEMO

Name **Bedell, John** Confirmation No **4793817** **6PM**
 Arrival **30-04-2012** Room **3016**
 Departure **06-05-2012**
 VIP Status **001**

12345667

Stay Details Rate Info | Change Stay Details | Daily Details | Edit

Arrival 30-04-2012	Adults 1
Nights 6	Children 0
Departure 06-05-2012	Rooms 1

Rate Code DAILY	Market PRO	Discount Code -
Rate 525.00 USD	Source IND	Discount Amount -
	Block Code -	Discount % -

Room Type **M4CAB**
Room **3016**

Deposit / Cancellation 1/1 X

Total Deposits Payments **0.00 USD**

Deposit Policy - 3 DAY
 Requested **100.00 USD** Paid **0.00 USD** Outstanding **100.00 USD** Deposit due by **27-04-2012**
 Deposit due 3 days prior to arrival

[Back](#)

My Favorites Site Map | V9.0.0.33.02