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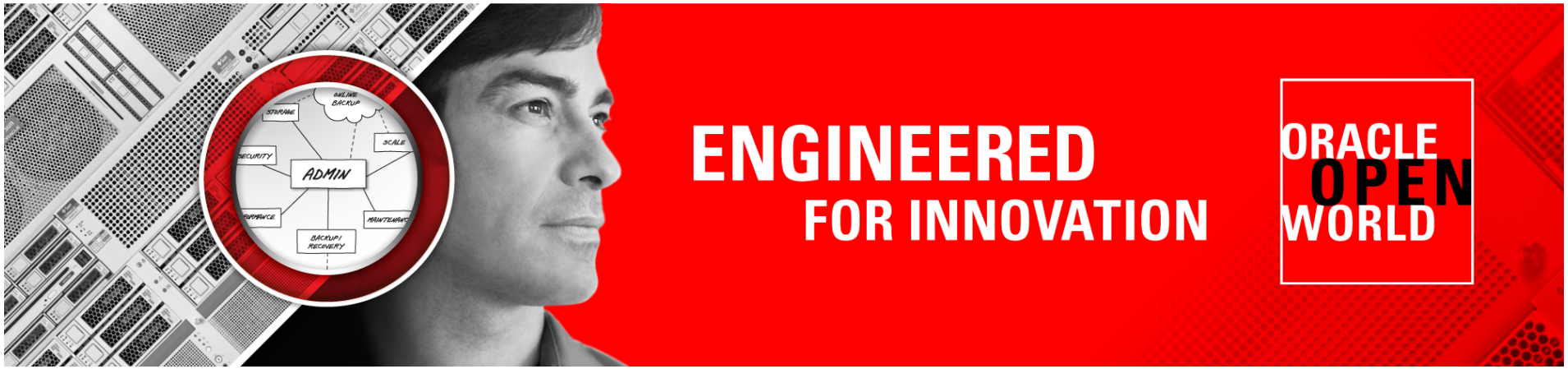

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Unified Management of Healthcare Data with Oracle Content Management

John Klinke, Oracle WebCenter Content
Melli Annamalai, Oracle Multimedia DICOM

ORACLE OPEN WORLD

ENGINEERED FOR INNOVATION

ORACLE

Latin America 2011

December 6–8, 2011

Tokyo 2012

April 4–6, 2012

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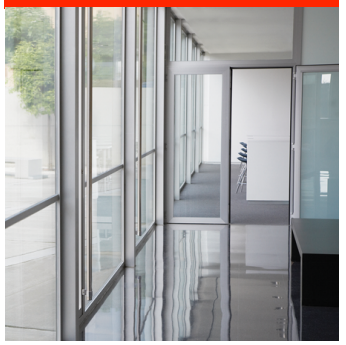
Agenda



- Customer case studies
  - Image-enabled Electronic Health Record
  - Clinical Trial Image Management
- Content Management Challenges in Healthcare
  - Focus on medical images
- Medical image support in Oracle products

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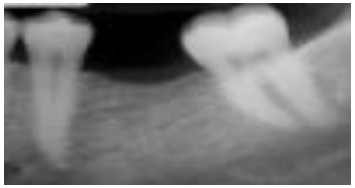
Medical Images



- X-Rays, CTs, MRIs, Pathology images, etc.
- DICOM (Digital Imaging and Communications in Medicine) is the universal standard data format
  - Images
  - Video
  - Structured Reports
- Non-DICOM formats for legacy and other medical images
  - TIFF, JPEG, etc.

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Spitalnetz Bern Hospital

Customer Case Study

- Network of 5 regional hospitals
  - Serving an area of 300,000 people
- 600 beds
- 2800 employees
  - Physicians
  - Nursing staff
  - Other clinical support staff
  - Data accessed by 2000+ people
- Switzerland

SPITAL NETZ BERN

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Improve Quality of Care and Lower Costs

Requirements

- Enable referring physician to track progress of patient in hospital
- Improve data access overall
  - Timely access to all patient data
  - Share and access patient data from any application
  - Access only with appropriate authorization
- One universal archive for all content
- Challenges related to images
  - Imaging systems (X-Rays, CTs, MRIs, Ultrasounds, etc.) are completely silo-ed
  - Access methods and communication protocol different from that of other patient data management systems

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Image-enabled Electronic Health Record

the i-engineers

- health engine from Oracle partner the i-engineers
- Provides universal access to patient data and images
- Understand images from multiple vendors

- Benefits
  - Reduced costs
  - Increased efficiency
  - Healthcare workers can focus on caring for patients and not aggravations of accessing data

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Bristol-Myers Squibb

Customer Case Study

- Top 10 pharmaceutical
- Invests $3.5 billion each year to discover and develop new medicines
- In the last few years have delivered new medicines for psychiatric disorders, rheumatoid arthritis, hepatitis B, cancer, HIV/AIDS and diabetes
- New Jersey, USA

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Management and Interoperability

Clinical trial sponsors (Pharmas)

- Access
  - Prohibitively expensive for clinical trial sponsors to access their own data
  - Images scattered across multiple repositories, across organizations
  - Data transfer for sharing is slow and error prone
- Security
  - Satisfy regulatory and privacy requirements while sharing data
- No process to control data quality
  - “What you see is what you get”
  - Poor data quality causes significant delays in the clinical trial process

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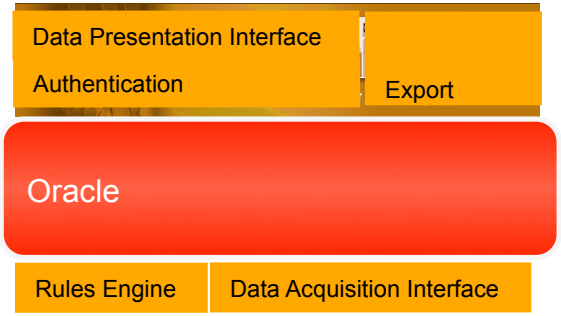
Clinical Trials Image Management Solution

- IBISImg solution from Oracle partner IBISWorks
- Improves data management efficiency and shortens time to market
  - Centralized repository for images
  - Unified management and access
  - Provide timely access to images



- Benefits
  - Cost-effective access to images when they want it
  - Access original image, and not just the report
  - Integrated access with clinical research systems
  - Improve quality: Validation is built into the workflow

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CONTENT MANAGEMENT IN HEALTHCARE

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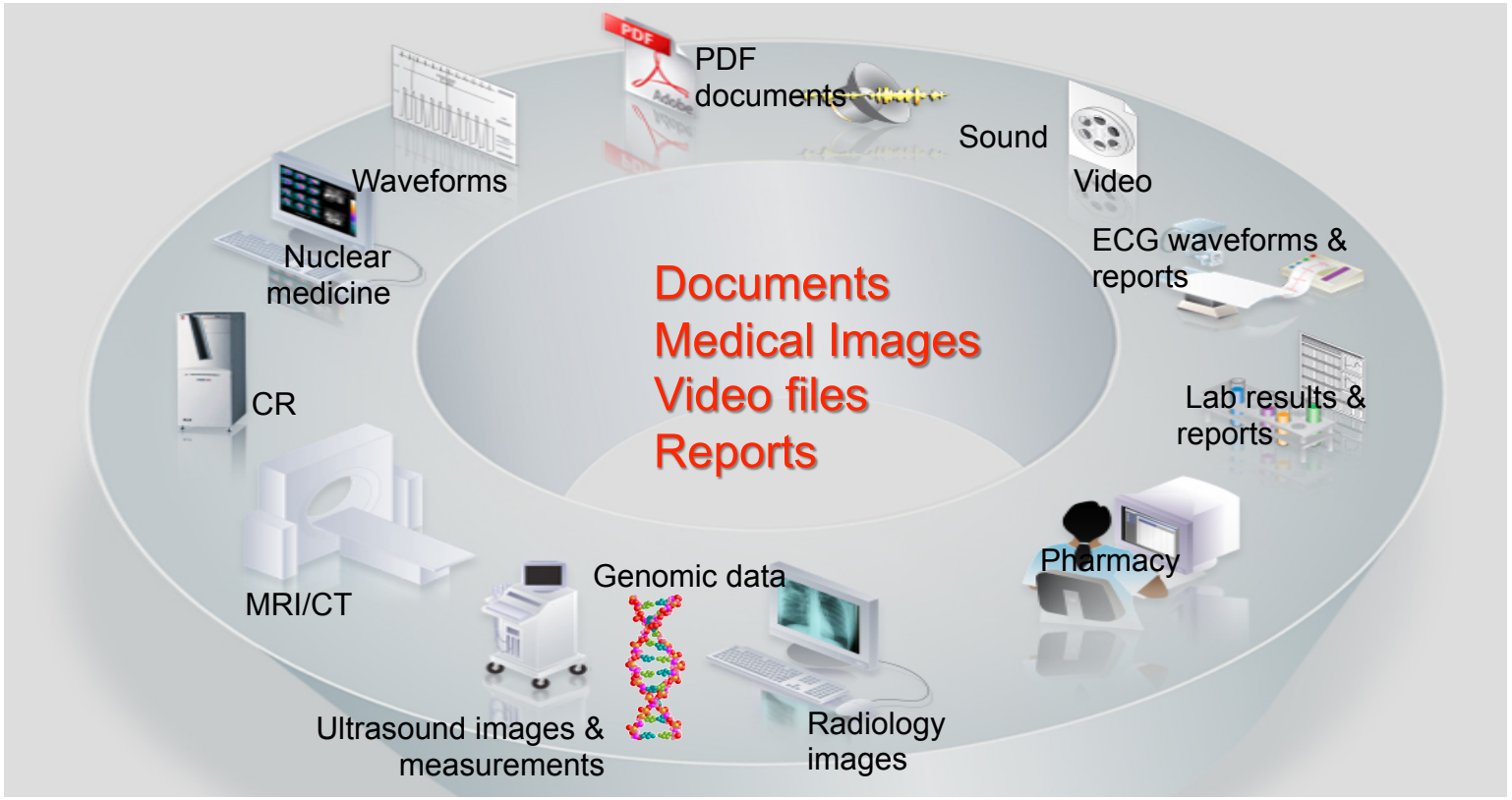
Healthcare Systems Rely on Content



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Multiple Types of Content in Siloed Systems

- Lack of unified view of patient content reduces quality
- Business processes are tied to individual systems
- Access to content is not uniform as they are in different systems
- Security policies are not uniform across the organization
- Retention policies are not uniform

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Integrating Medical Images with Other Data

Major Challenges

- DICOM images are in systems that are completely siloed
  - PACS (Picture Archiving and Communication Systems) store and manage DICOM content
  - Image-specific DICOM protocol is used to access images
  - DICOM content not integrated with other applications

- Siloed image management systems are inefficient
  - DICOM images cannot be easily accessed across the organization
  - Sharing is difficult
  - Including images in other applications is hard

* DICOM is the ubiquitous medical image format standard

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Medical Image Data Volume

Repository Growth Compounds the Problems

- Massive increase in data volume (image volume doubles every 18 to 20 months*)
- Image sizes range from 0.5 MB to multiple GBs
- An image study can include thousands of individual images
- Increased costs for storage, development, deployment and maintenance

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* Frost and Sullivan

DICOM SUPPORT IN ORACLE PRODUCTS

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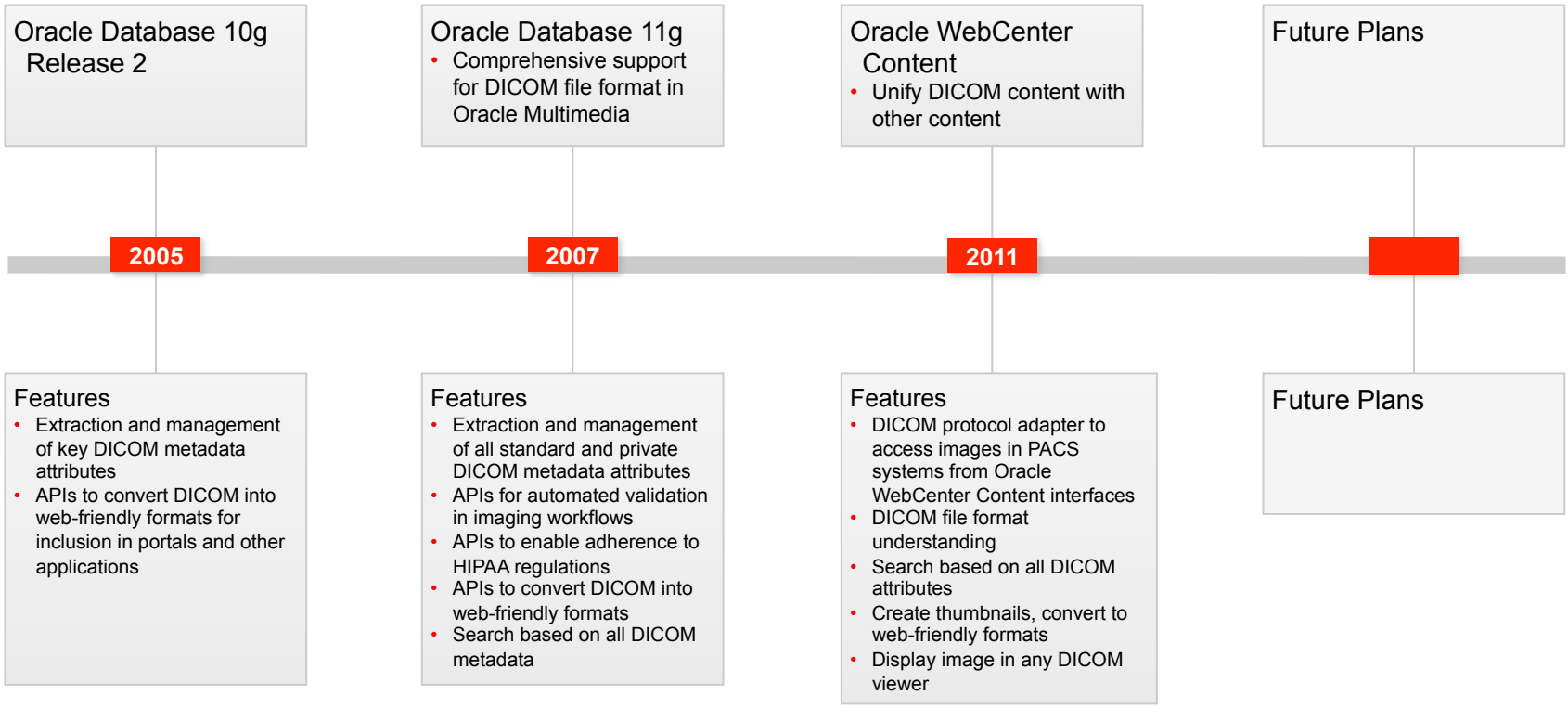
DICOM Support in Oracle Products



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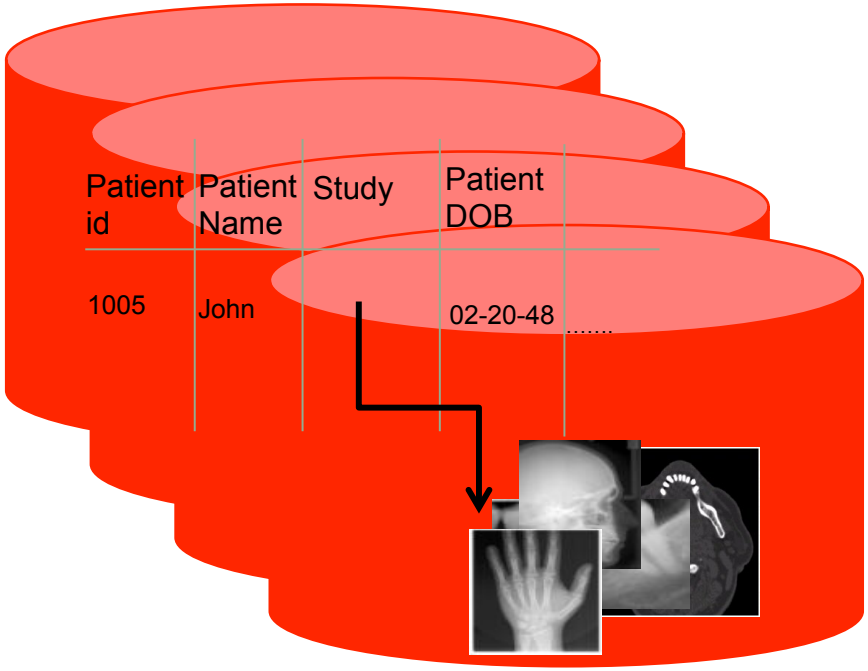
Manage Images with Database Infrastructure



- Standards based open programmable platform for sharing and interoperability
- Database features
  - Data synchronization
  - Protection against data loss
  - Security
  - Availability
  - Scalability

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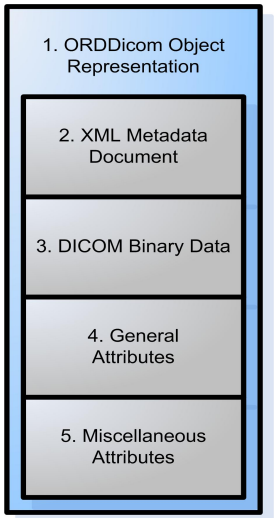
Native DICOM support in Oracle Database



- SQL, PL/SQL and Java APIs for rapid development and deployment

- (zero code) Metadata extraction
- (zero code) Anonymization of image metadata
- (zero code) Automated DICOM data validation
- (zero code) Include DICOM content in reports and display in browsers
- (zero code) Create DICOM images from legacy non-DICOM images

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Some Technical Details

- Extract standard DICOM and proprietary extensions by PACS vendors
  - Enables interoperability and sharing across systems
- Convert DICOM to JPEG for easy viewing and access in browsers
- Basic image processing operations

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Benefits

Feature	Benefit
Unified management of images	Simplify management and lower costs
Extract, store, and search metadata from any PACS vendor	Both standard (2000+ tags) and private tags are available for use
Granular access control	Access only to authorized users At organization level, user level, scan level
Audit access and operations	Audit trail for regulatory compliance
Retention policies management	Lower costs and simplify maintenance
Flexible data retrieval	View images in DICOM viewer of choice View images from anywhere (HTTP based transfer)

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Announcing

DICOM Support in Oracle's Enterprise Content Management Platform: WebCenter Content

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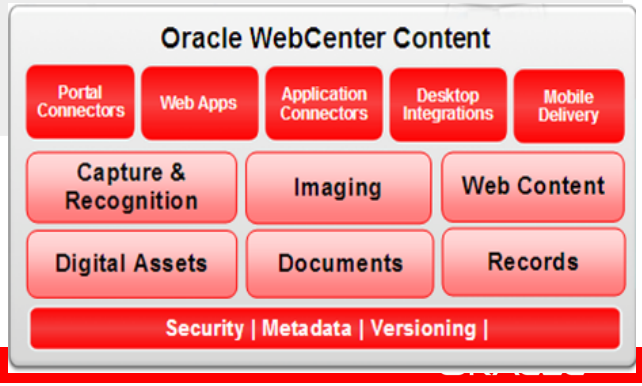
WEBCENTER CONTENT

Seamless Access to the Right Information in Context

- Strategic content infrastructure for managing all documents, images, and rich media files
- End-to- End content lifecycle management from creation to archiving
- Contextual application integration



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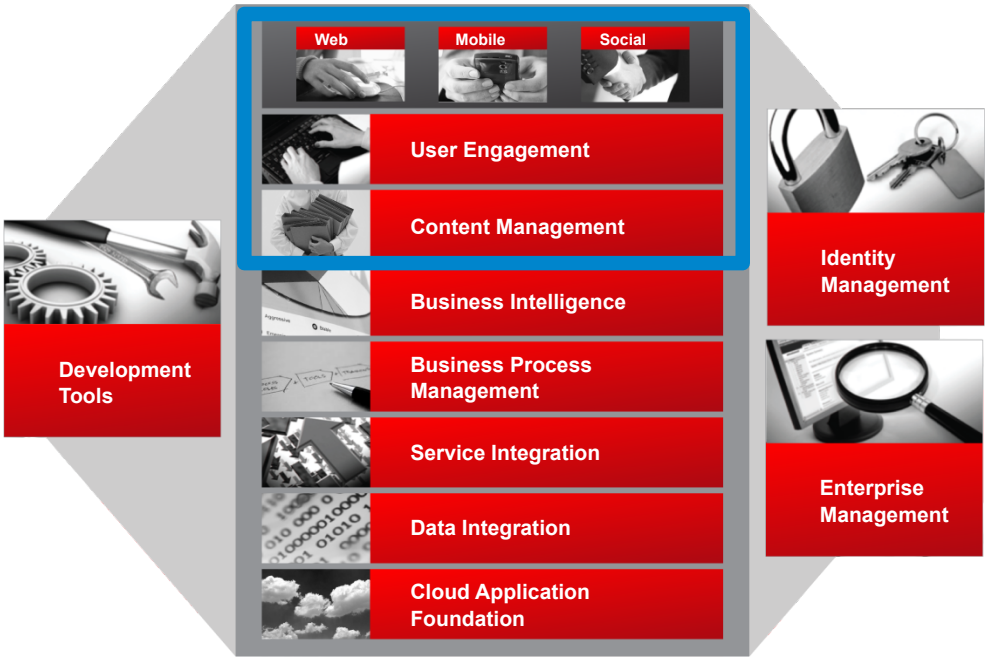
Oracle Fusion Middleware

Complete, Open, Integrated, Best-in-Class



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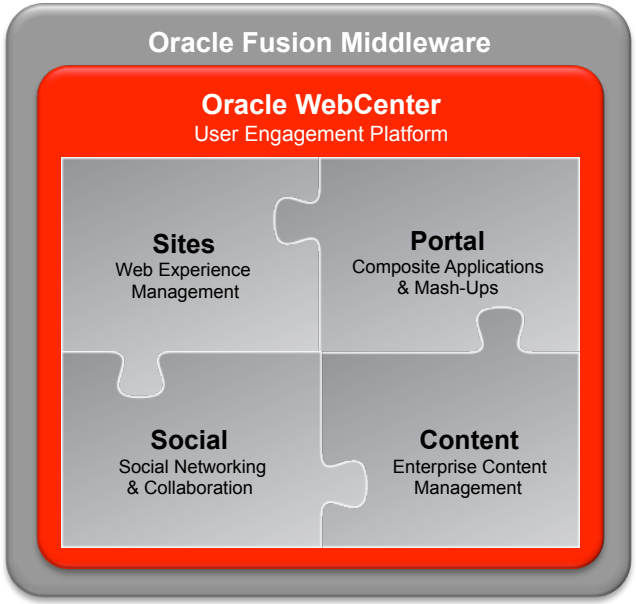
UCM, URM, IRM → Oracle WebCenter Content

Products you may know…

- Enterprise Content Management Suite → Content
  - Universal Content Management (UCM), Universal Records Management (URM), Information Rights Management (IRM)
  - Imaging & Process Management (I/PM), Document Capture, Distributed Document Capture, Forms Recognition
  - Application Adapters for Enterprise Content Management
- WebCenter Suite → Portal
  - WebCenter Portal, Framework, Spaces
  - WebCenter Services
  - WebLogic Portal
  - WebCenter Interaction
- FatWire → Sites
  - Content Server, Satellite Server, Mobility Server
  - Engage, Analytics
  - Gadget Server, Community Server

Have become…



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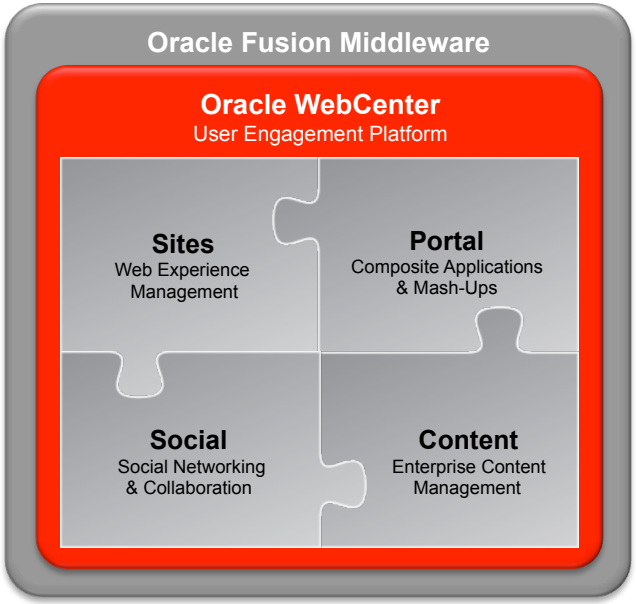
Oracle WebCenter

The User Engagement Platform for Social Business



Oracle WebCenter is the user engagement platform for social business, connecting people and information

- Increase customer loyalty with personalized online experiences
- Drive innovation with portals & composite applications
- Enhance productivity with contextual collaboration
- Optimize information access with content management

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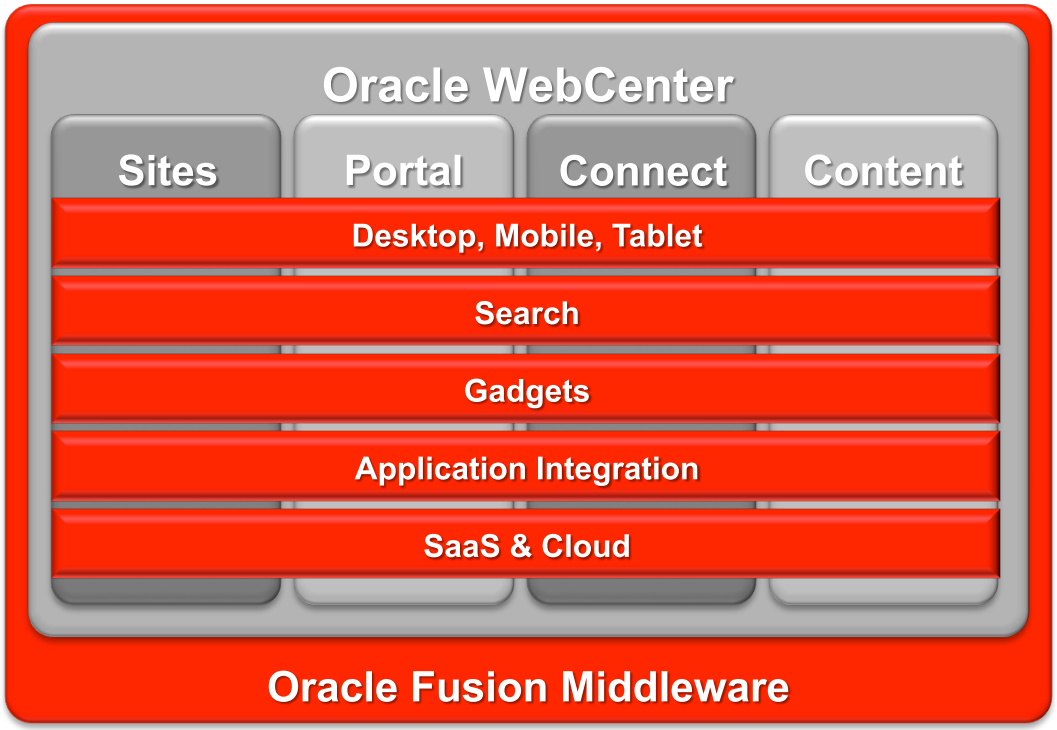
Oracle WebCenter: Architected Together



- Single Content Repository & Infrastructure
  - Share content across organization, internally and externally
- Embedded Social Channel
  - Collaborate with others directly from applications and Web sites
- Reusable Enterprise Gadgets
  - Build once and use everywhere
- Optimized for Application Integration
  - Enables user experience in Oracle and other enterprise applications
- Built on Fusion Middleware
  - Complete, open, integrated, scalable, high-performance, cloud

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Oracle WebCenter Content

One Platform, One Vendor

Comprehensive

- Documents, Images, and Digital Asset Management
- Records and Retention Management
- Information Rights Management
- Imaging and Process Management

Pre-Integrated

- Leverages Oracle Database and Fusion Middleware technologies (WebCenter Portal, SOA, BPM)
- Out-of-the-Box integrations with Siebel, JD Edwards, E-Business Suite, and PeopleSoft

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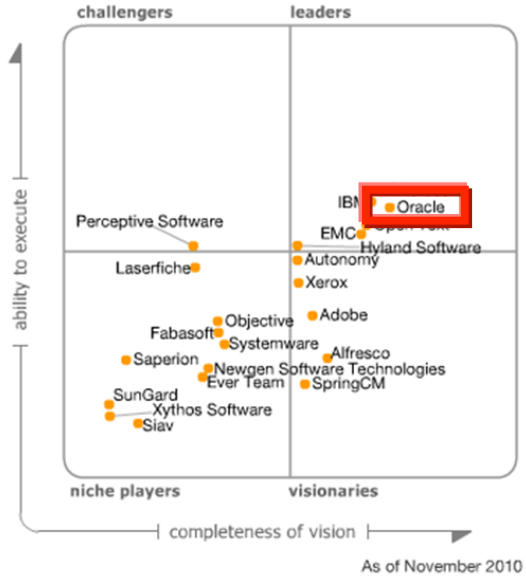
Industry Analysts' Perspective

Gartner Magic Quadrant for Enterprise Content Management

November 16, 2010



This Magic Quadrant graphic was published by Gartner, Inc. as part of a larger research note and should be evaluated in the context of the entire report. The Gartner report is available upon request from Oracle.

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New Capabilities

Oracle WebCenter Content Platform

- Understand DICOM file format
  - Parse DICOM metadata on DICOM image check-in
  - Search repository based on DICOM metadata
  - Convert DICOM to web-friendly file formats (JPEG, GIF)
- DICOM protocol adapter to connect with PACS systems and DICOM viewers

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Easy Access to Images

WebCenter Content

- Powerful Search
  - Metadata search, Thumbnails
- Access images enterprise-wide
  - Avoid ‘lock in’ at place of storage
- Re-use image data in a range of applications
  - Lower costs, improved flexibility
- Maintain security and privacy
  - Adhere to HIPAA regulations while sharing images

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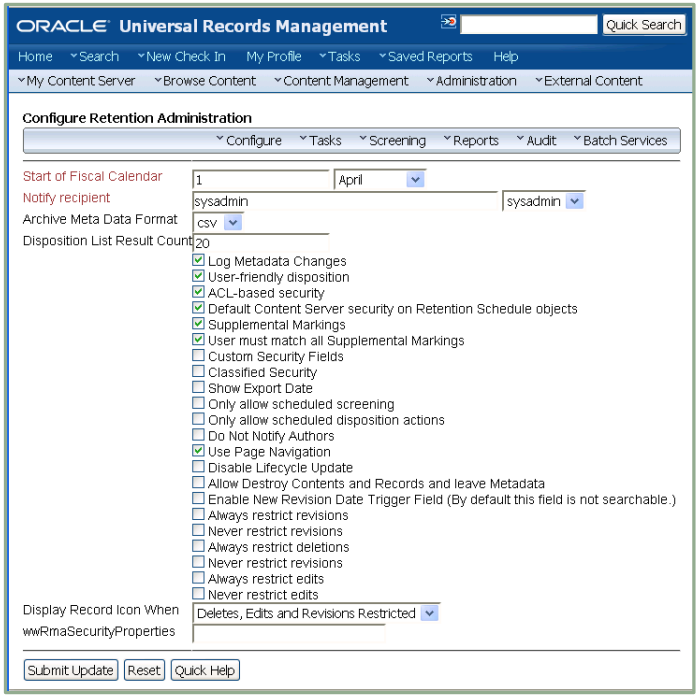
Improved Lifecycle Management

WebCenter Content

- Intelligent Classification and Storage
- Automatically apply retention policies
  - Lower costs and simplify maintenance



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High Scalability and Performance

WebCenter Content

- High Performance
- High Scalability
- Oracle Software and Hardware: Engineered to Work Together

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Sample Applications

- Providers
  - Centralized and unified to images from PACS systems from multiple vendors
  - Search and reporting on patient data and DICOM metadata to lower costs and improve patient outcomes. Ex: Report to highlight radiation dosage on patient outcomes
- Patient portals by provider
  - Patients can access their images along with other information
- Payers
  - Provide all clinical information to patients
  - Include images in reports

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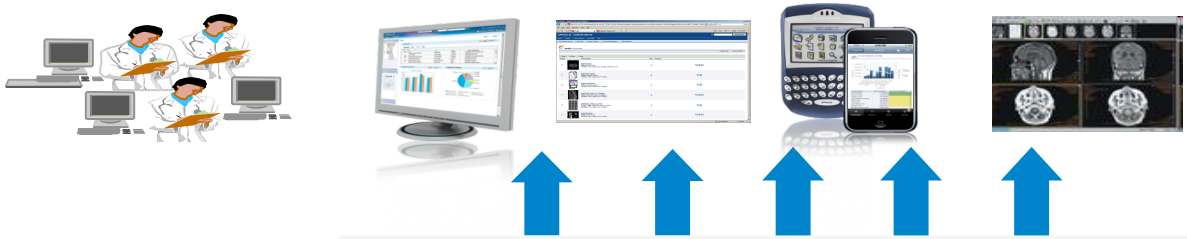
Unify Access to All Healthcare Data



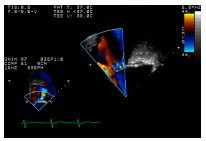
Data Presentation, Authentication

Oracle WebCenter Content Platform

Data Acquisition

DICOM images
from CDs, DVDs, files

DICOM Protocol



DICOM Video Content

PACS

Documents, Images, Video, Unstructured data

Add DICOM to types of content managed by Oracle Content Management

Reports

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Questions?

Oracle WebCenter blog:
http://blogs.oracle.com/webcenter

Oracle WebCenter Homepage:
http://www.oracle.com/webcenter

Oracle WebCenter Newsletter:
http://oracle.com/newsletters

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Facebook:
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Hardware and Software

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Engineered to Work Together

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Q&A

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WebCenter Content on Oracle SuperCluster

Improved Performance

11x Faster

Accelerate Time to Value

Deploy in 11 days

Simplified Operations

50%

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- ✓Enterprise Management
- ✓Oracle Database 11G R2
- ✓Solaris 10 & 11
- ✓Virtualization
- ✓SPARC Supercluster
- ✓ZFS Storage Appliance 7420

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