

A Knowledge and Content Management Strategy for the Pharmaceutical “Knowledge Worker”

Enabling a People-Ready Business in Life Sciences

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Microsoft Corporation



Microsoft

<http://www.microsoft.com/industry/manufacturing/default.mspx>

Knowledge worker

- **A term coined by Peter Drucker in 1959**
- **One who works primarily with information**
- **Or one who develops and uses knowledge in the workplace**

Source: Wikipedia

A global change in the way we work

- Be more responsive and connected to people and information
- Move away from the desk, the office and traditional hours
- More options on how and when they work
- Access to more tools to meet their work needs than ever before

It's exciting to witness the greater productivity among individuals, teams and organizations in this new world of work and how it continues to evolve

Jeff Raikes, President, Microsoft Business Division

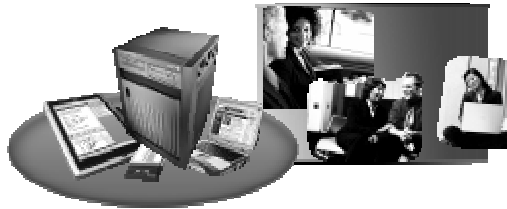
Microsoft Manufacturing Industry – Focus verticals

- Automotive
- High Tech and Electronics
- Consumer Packaged Goods (CPG)
- Oil and Gas
- Pharmaceuticals
- Utilities

Microsoft Manufacturing Vision

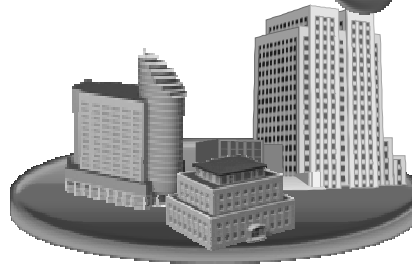
To accelerate our customers' insight into their businesses and empower their innovation by delivering Microsoft and Microsoft partner solutions that will enable their people to improve their ability to achieve peak performance

Investment in the Industry Unit



Engage with our customers

- Microsoft Pharma Advisory Council



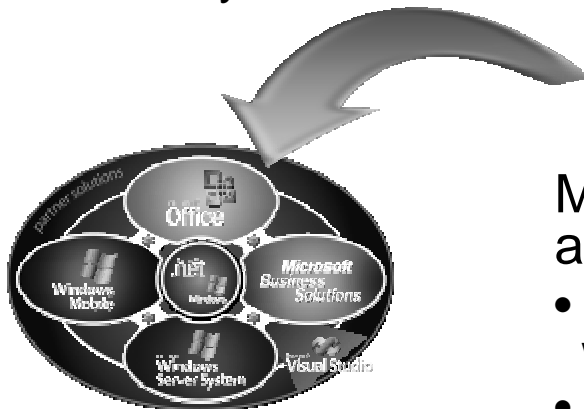
Microsoft industry vision and value proposition

- Investment in resources with industry skills
- Project funding



Build comprehensive industry solutions with our partners

- Bio IT Alliance



Work with our product teams to meet industry needs

- MS Health Solutions Group

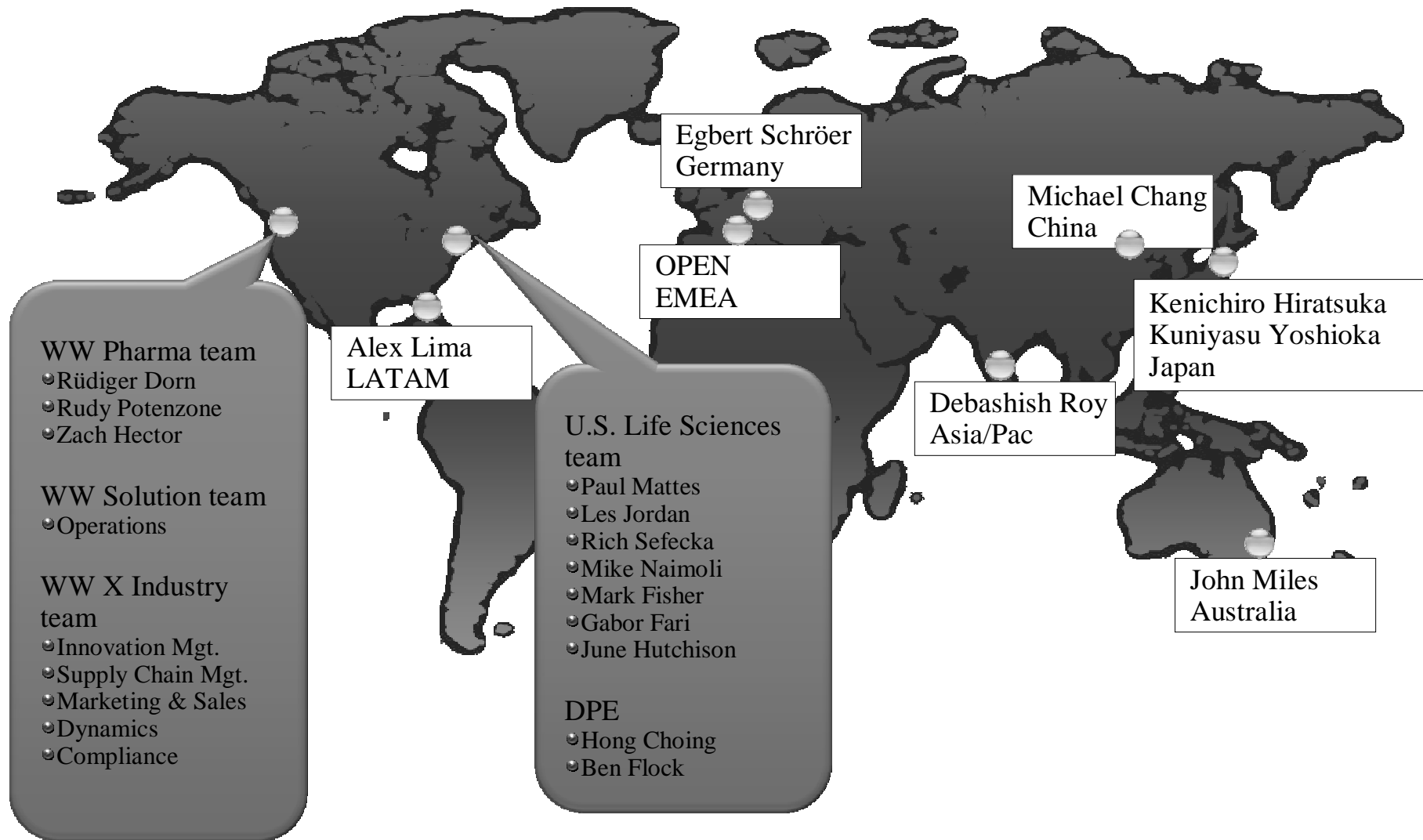


Engage with standard bodies

- CDISC
- SAFE
- SCOR, EPC, OPC...

<http://www.microsoft.com/industry/manufacturing/default.aspx>

Life Sciences Community Worldwide





**Harnessing
Information for
Biotechnology**

**The Microsoft Bio IT
Alliance**



The Microsoft Bio IT Alliance

- Microsoft tools are the Lingua Franca of life science: EXCEL, Word, PowerPoint
- The Bio IT Alliance was established in 2006 to provide a forum to foster community collaboration, the evolution of current tools with emerging technologies, and stimulate new tool development



Goals of the BioIT Alliance

- Communicate key technology capabilities from Microsoft that are relevant to the Life Science community
- Demonstrate novel new uses of IT technologies by Partner members
- Foster communication and collaboration between Partner members



The Microsoft Bio IT Alliance

- Founded April of 2006 with 12 Partners
- There are now over 60 members
- BITA Forum Activities
 - Demonstrate the new Microsoft products for complex information problems
 - Facilitate the adoption of new Microsoft products by partners and customers
 - Foster collaboration and communication between partners



BioIT Alliance Partner Activities

- The Scripps Research Institute technology demo onstage with Steve Balmer at Vista/Office launch and HIMSS
- First life science vendor on CCS (BioTeam)
- Applied Bio adoption of Office Open XML
- International recognition as an important initiative for the industry
- Cooperation with the National Center for Biotechnology Information (NCBI) for key Web Service interfaces

www.bioitalliance.org

Knowledge Driven Life Sciences

Software for a People_Ready Business

Where people benefit from technology that empowers breakthrough results in business performance, product innovation and process optimization.



familiar
and easy to use



widely used and supported

Microsoft TechNet

Microsoft Learning



Help and Support



easier to integrate
and **connect** with
what you have



innovative
and continually evolves
to meet your needs



Microsoft's Evolution

- Introduction of an Enterprise Focus
- Increasing focus on the Global Healthcare community
- Maturation and deployment of a significant technology investment

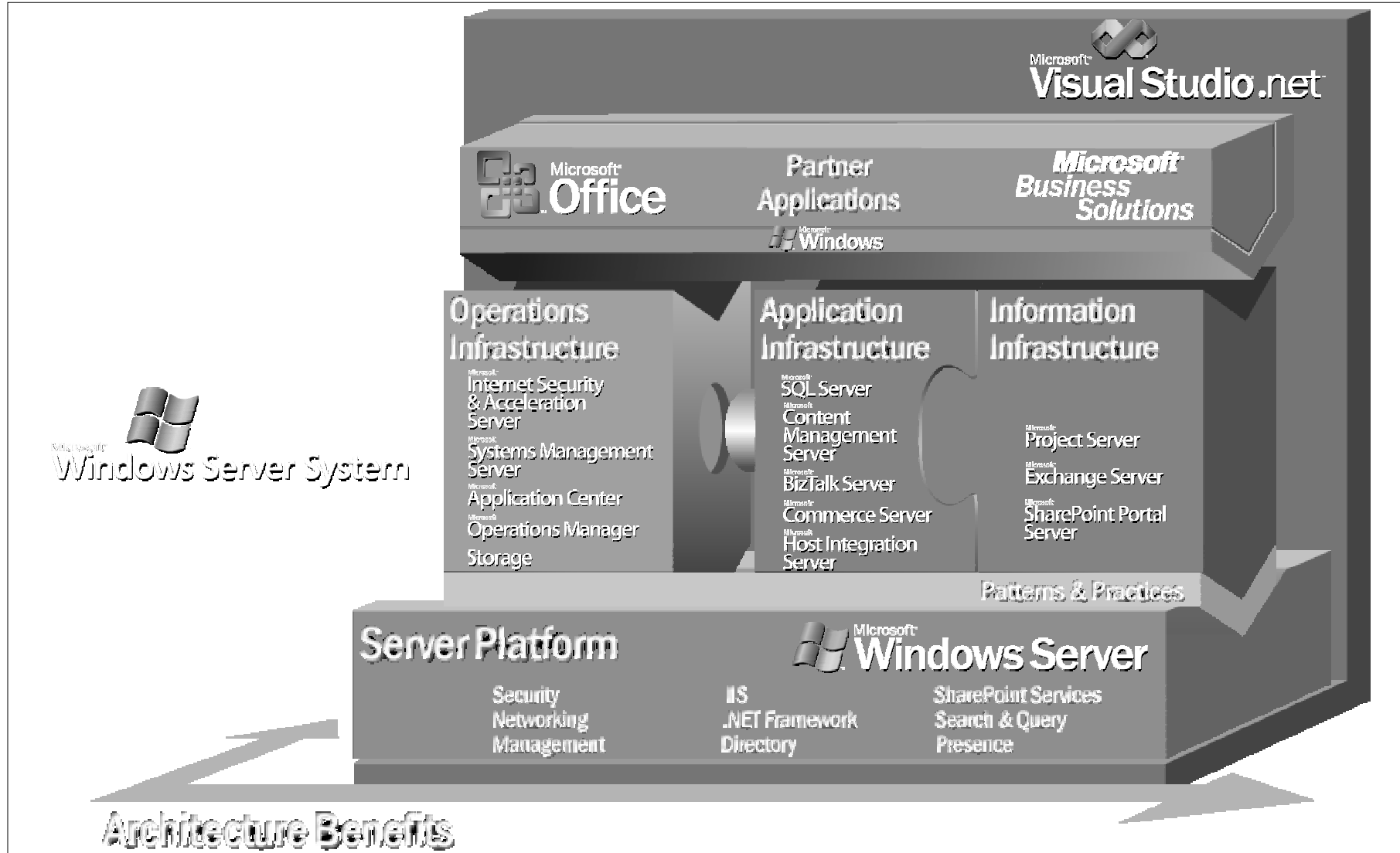
Why Now?

Microsoft Innovations in 2007

- Vista
 - .Net 3.0; 3.5
 - Windows Presentation Foundation
 - Workflow Foundation
 - Compute Cluster Server
- Office 2007
 - SharePoint
 - Office Business Apps (OBAs)
 - Excel Server
- Open XML
- Unified Communication
- Silverlight
- Digital Rights Management
- Groove
- Performance Point
- Longhorn Server

Knowledge Driven Life Sciences

A platform for innovation



Life Science Industry Challenges

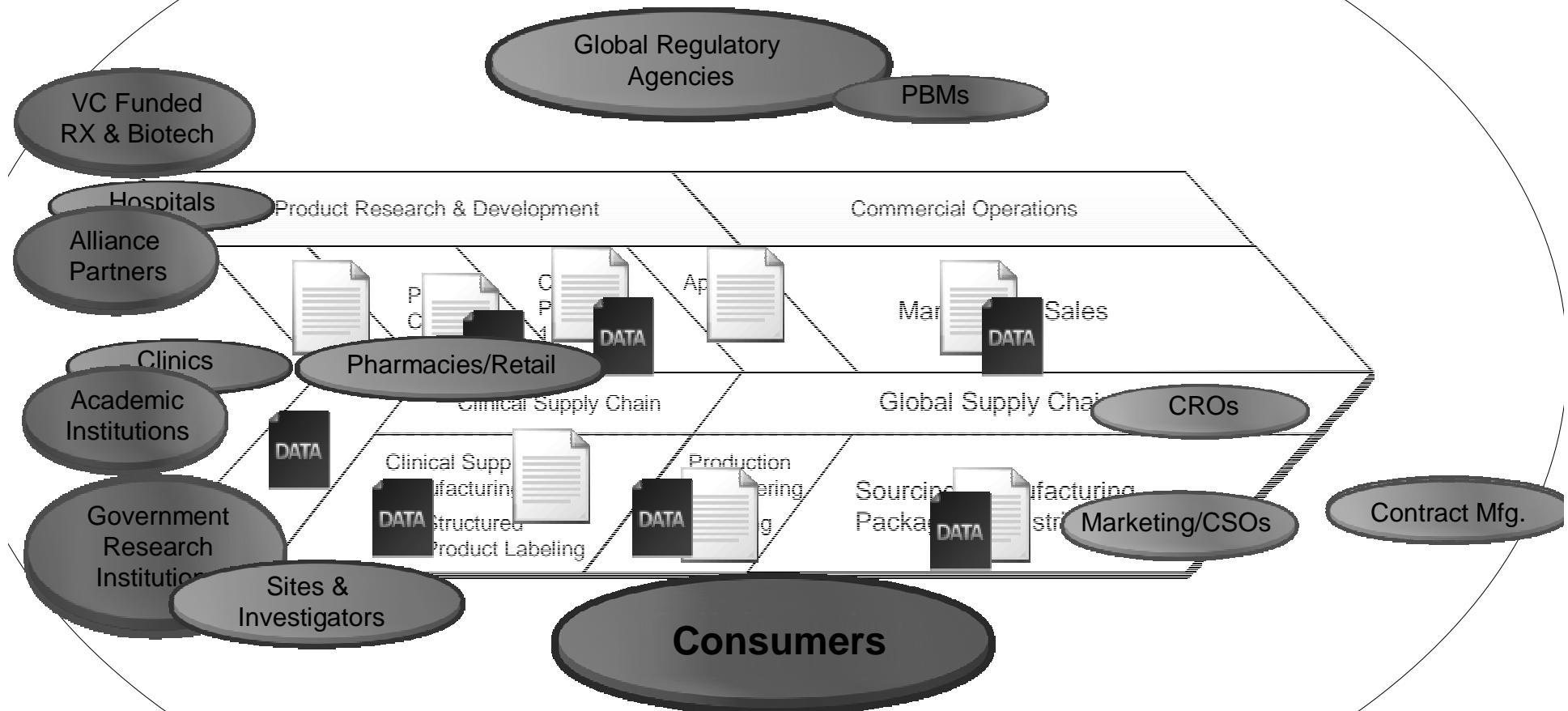
- Inefficient drug discovery and development
- Long trial phase
- Complex regulatory environment
- Lack of system and data integration
- Internal and external organizational pressures
- Profitability pressures

The Disconnected Enterprise!

- Inefficient process for collecting data
 - Lab equipment, lab notebook, external sources, etc.
- Structured and unstructured content is both tedious to create and difficult to use
 - Inconsistent formats
 - Applications are inconsistent and not well integrated
 - Often, manual processes are required for effective use
- It is hard to find the Corporate Truth

Knowledge Driven Systems Sciences

Building & Managing the Supply Chain of Integration



The Scientist Workbench

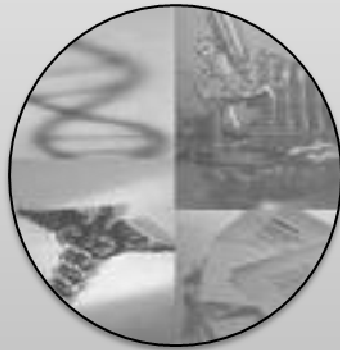
Goals

- Enabling better science
- Increasing efficiency and effectiveness of discovery projects
- Enabling better decision making
- Help filling the discovery and development pipeline
- Bringing safer products to market faster and cheaper

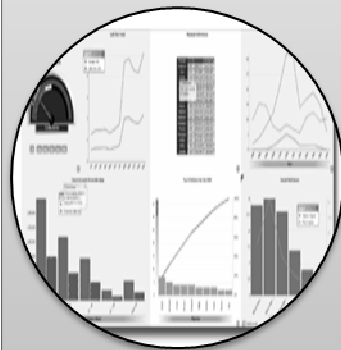
Discrete silos of information



Prior Art
Team Project
Data
Corporate
Knowledge
Banks



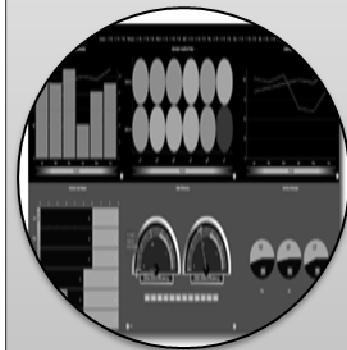
Experiments
Analytical
Instruments



Analysis
Multiple Tools

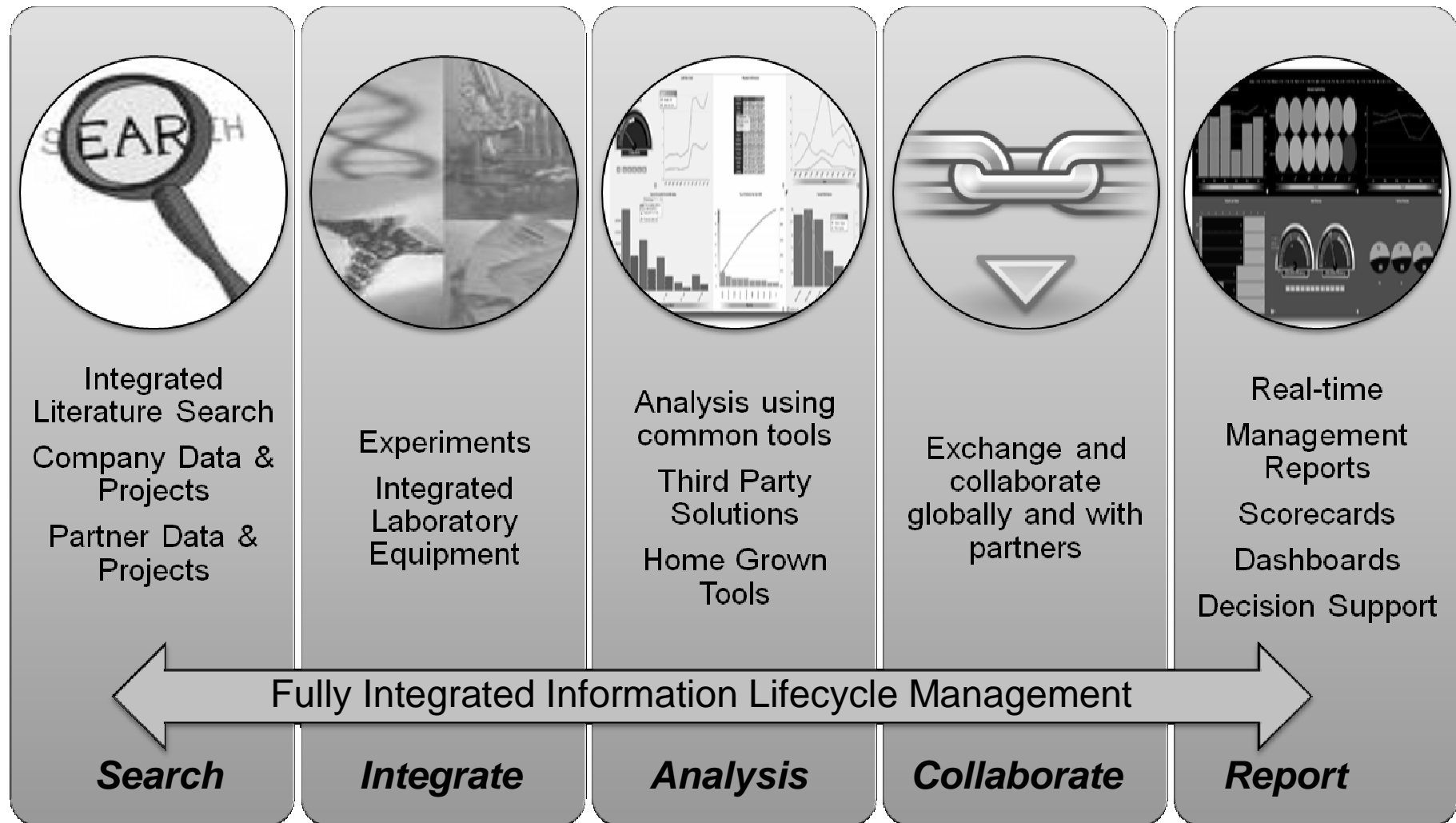


Review ideas
with team
members



Management
Reports
Decision
Support
Portfolio
Management

Scientist Workbench Approach



File Help
/A/ 16 21 26 31 36 41 46 51 56 61 66 71 76 81 86 91 96
HHHHEETLLNT TADLKWVTFPQVDGQWEELSGLDEEQHSVRTYEVC DVQRAPGQAHWLR TGWVPRRGAVHVYATL RFTML

Scientist WorkBench



Rotate
Zoom
Menu

Shift Ctrl





Content

Experiments

Tools

Experimental Details

Group

Equipment Details

Documents

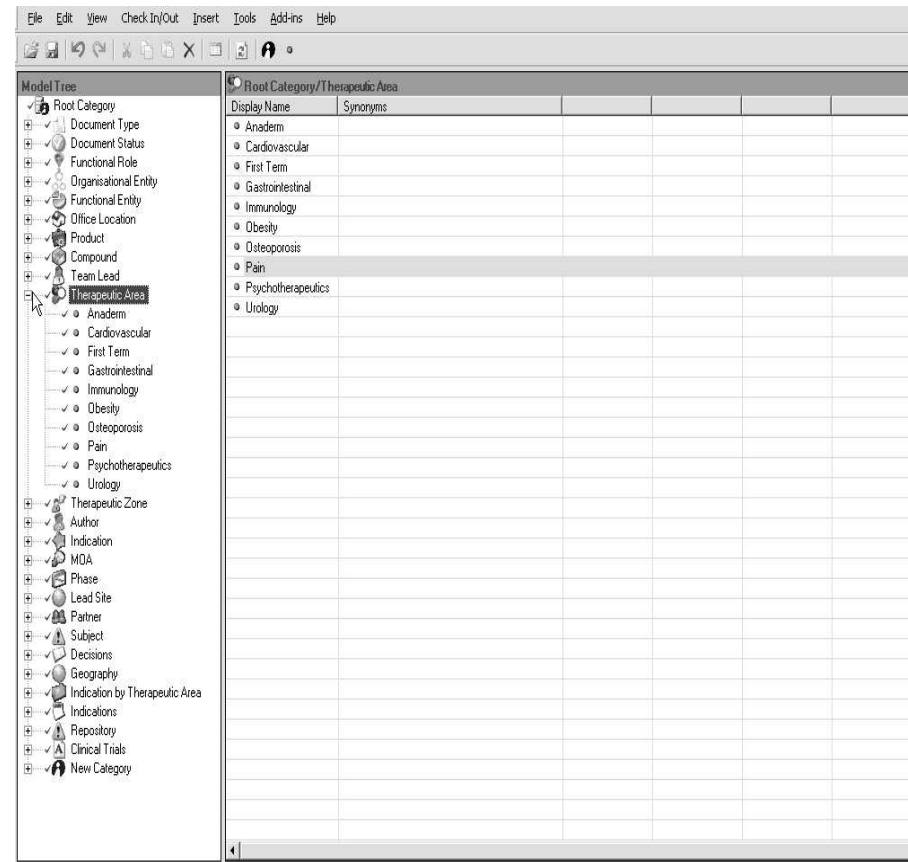
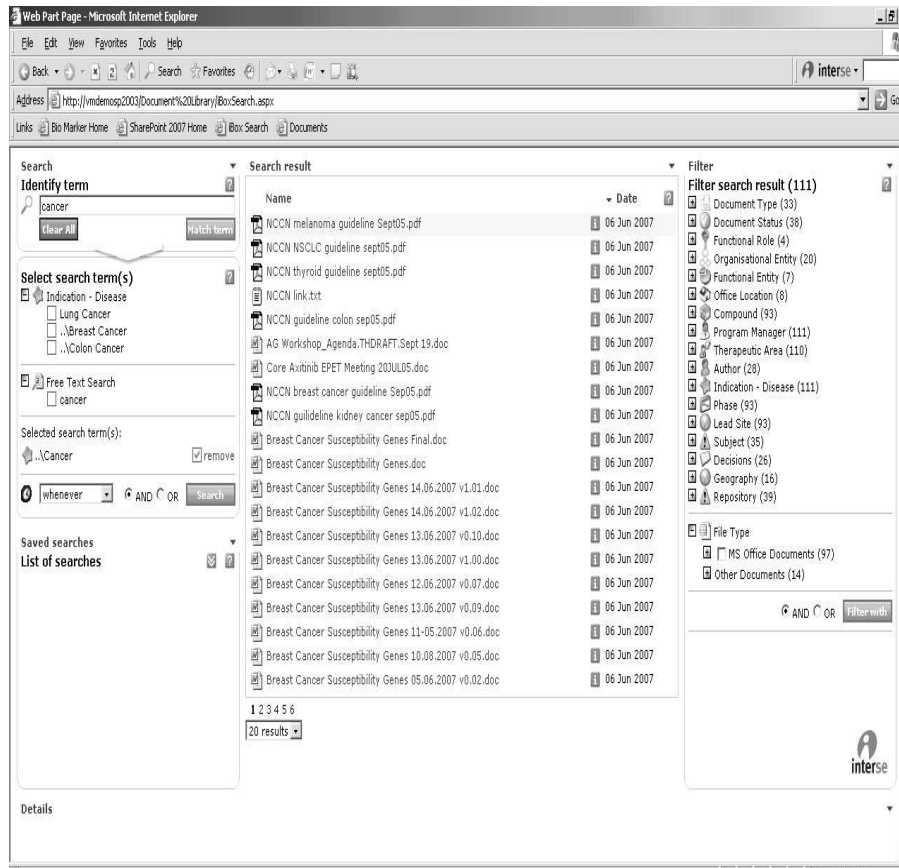
SNPs Observed ▾

Leukemia Experimental Data ▾

Integrated Knowledge Search

- **Beyond Search**
 - Contextual
 - Metadata based
 - Integrated with Office applications
 - Extensible to in house applications
- Where you work
 - Available through browser or Office 2007 app
 - Utilize “SmartTag” functionality
- Internal data and info
- External data and info
 - PubMed
 - PubChem

Integrated Knowledge Search



Example Metadata Search tools using iBox from Interse

Data and Device Integration

- Give scientists a single interface to the data generated by laboratory devices
- Allow the data to be shared and viewed by others with appropriate security
- Utilize open formats & standards
 - Office OpenXML (OOXML)
- Make the data available for visualization and deeper analysis through new tools

Data Visualization and Analysis

- Rich visualization capabilities within SharePoint and Windows Presentation Foundation & other .NET Framework 3.0/3.5 technologies
- 3rd party visualization applications can be integrated
- Fully Integrated with standard Microsoft products including Microsoft Office
- Potential for inclusion of Open Source applications

Visual Query Builder And Analyser

QUERY PARAMETERS

SPECIES

e

- Enterobacter aeroge
- Enterobacter cloacae
- Enterococcus faecali:
- Enterococcus faeciar
- Escherichia coli

TARGET

- A-BAC
- Bacterial 23S ribosor
- Bacterial Membrane
- bifunctional glmu pr
- E. coli tol c
- E. coli with P
- E.coli biotin carboxyl
- Non-protein target -
- udp-3-o-[3-hydroxyr
- Whole cell growth in

CONDITION

- Presence Of Erythror

Date Range

From 03/Jul/2006 To 04/Sep/2007

MY QUERIES

Last Changed on Mar 29, 2007

TABULAR VIEW **HEATMAP** **SELECTED DATAPOINT** **EXPOSURE RESPONSE** **QUALITY ANALYSIS**

STANDARD VIEW **OVERLAY VIEW**

Endpoint IC50(MG_KG)

1

0

-1

0 40 80

Compound Number: CP-093600-03

Species: compounds

Screen Protocol: REVERSAL OF AMPHETAMINE-INDUCED LOCOMOTOR BEH IN RATS

Cell Line Code:

Target: REARS

Endpoint Value: 0.0594978991225741

Endpoint Type: IC50

Endpoint Unit: MG_KG

Response (IC50/IC50(K))

1.5 2 2.5 3 3.25 3.5 4

Hepatitis C Virus NS5A Inhibitor

ATPass

PDE6 Inhibition SPA

Inhibition Assay - S.Conrad, Y.Yagi

PK Rat Definitive

Datapoint Details

Running

Collaborating in Scientist WorkBench

- Utilize collaborative capabilities
 - Team sites, shared workflows
 - Presence, instant messaging, white boarding
 - Live Meeting
- Extended collaboration to the ecosystem
 - Include secure partner access
- Enable compliance
 - GxP, CFR 21 Part 11
 - Auditing, document history, electronic/digital signatures

Scientist WorkBench










Safe Drug Pharmaceuticals

Excel

View Insert Format Tools Data Window Help

Arial 10 B I U

Screened Inhibitors List.xls [Read-Only]

Project id	Assay Type	Protocol id	Plate id	Well Number	Chemical Molecule id	Chemical Structure	Concentration
SD001I	Inhibition	PfON001	AF100	96	Cid001		20uM
SD001I	Inhibition	PfON002	AF100	95	Cid001		22uM
SD002T	Toxicity	PfON003	AF102	22	Cid002		10uM
SD003A	Adsorption	PfON004	AF103	32	Cid002		40uM
SD003A	Adsorption	PfON005	AF103	55	Cid003		45uM
SD004I	Inhibition	PfON006	AF100	21	Cid003		20uM
SD004I	Inhibition	PfON007	AF100	47	Cid004		20uM
SD006T	Toxicity	PfON008	AF102	43	Cid005		0.05uM
SD006T	Toxicity	PfON009	AF102	94	Cid005		0.02uM

Conversation

Participants (2)

- Brenda Diaz
- Anders Madsen

Instant Message

Never give out your password or credit card number in an instant message conversation.

Brenda Diaz [3:15 PM]:
Hi - do you have a moment?

Anders Madsen [3:15 PM]:
Yes - let's use video as well.

You have asked to have a video conversation with Anders Madsen. Please wait for a response or Cancel (Alt+O) the pending invitation.

Anders Madsen has accepted your request to have a video conversation.

Send

Switch Video

Stop

Show Full Screen Video

Anders Madsen

Brenda Diaz

Last message received on 2/17/2005 at 3:15 PM.

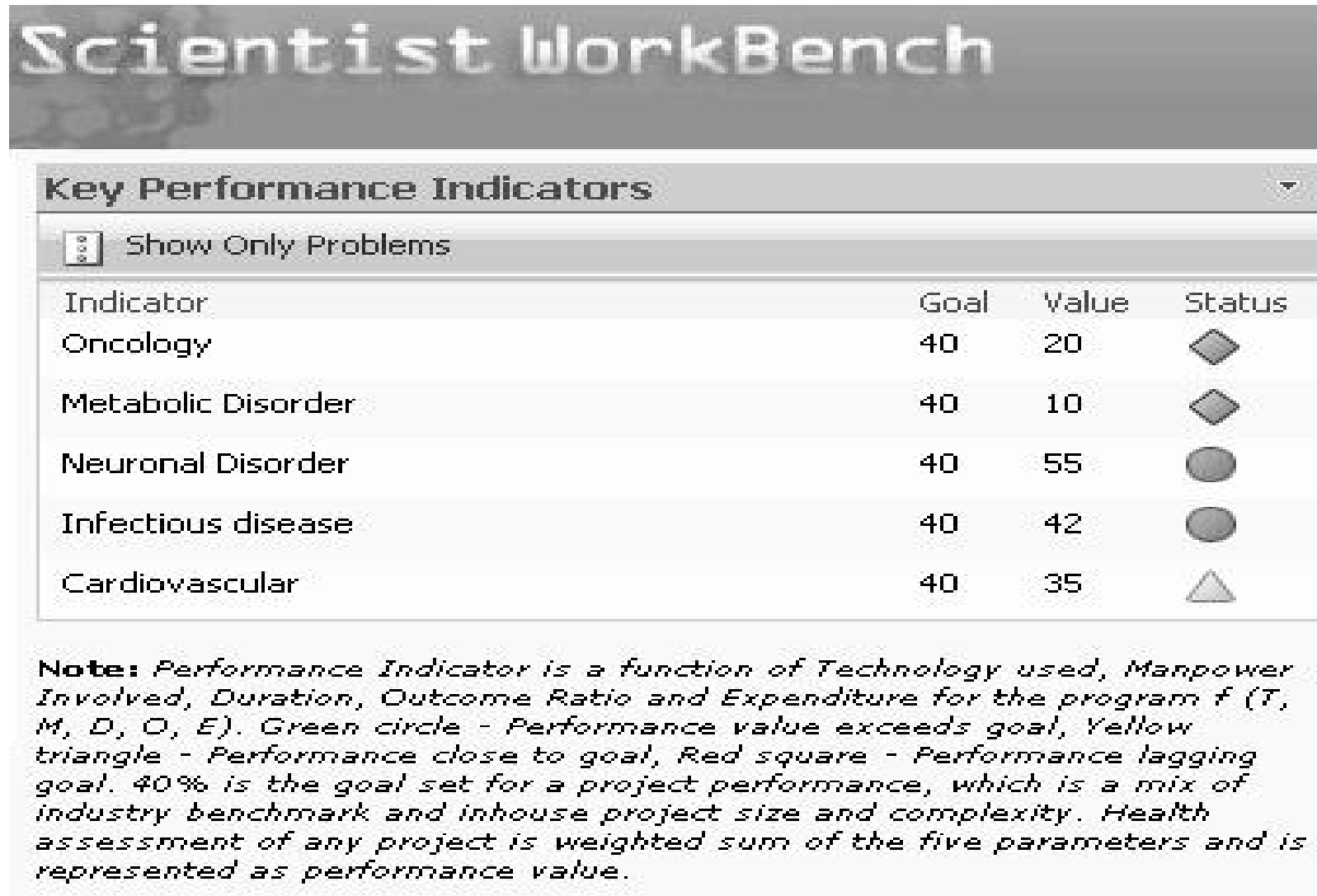
MicroArray Project Documents

Booked Till	Type	Name	Modified
02/13/2007	Clinical		8/13/2007 7:06 PM

Reporting & Portfolio Management

- Roll-up information from the bench into management reports
 - Eliminate re-entry of information or data
- Enable management reports to combine with pipeline status to provide portfolio views
- Implement Real Time Project Dashboards and Scorecards

Reporting Dashboard



Reporting Details

Oncology Program Details							
Start Date	End Date	No. of Resources	Expenditure (in Mn\$)	Budget (in Mn\$)	Projects in Each Phase	Project Outcome	Candidate Drug
[-] Disease Focus : Breast Cancer (3)							
2/10/2001	3/25/2003	5	120	136	Target Identification and Validation	5 Targets	
3/27/2003	7/25/2004	2	173	150	Lead Identification and Validation	2 Leads	
7/30/2004	5/15/2005	3	95	88	Pre Clinical	1 Candidate Drug	1
[-] Disease Focus : Colon Cancer (3)							
1/10/2000	2/25/2001	4	200	75	Target Identification and Validation	4 Targets	
3/1/2001	4/17/2003	3	250	210	Lead Identification and Validation	3 Leads	
4/25/2003	12/29/2003	2	100	78	Pre Clinical	1 Candidate Drug	
[-] Disease Focus : Lung Cancer (3)							
11/23/2005	12/13/2006	4	78	80	Target Identification and Validation	2 Targets	
12/18/2006	5/28/2007	6	190	163	Lead Identification and Validation	2 Leads	
6/2/2007	4/23/2008	2	86	68	Pre Clinical	1 Candidate	

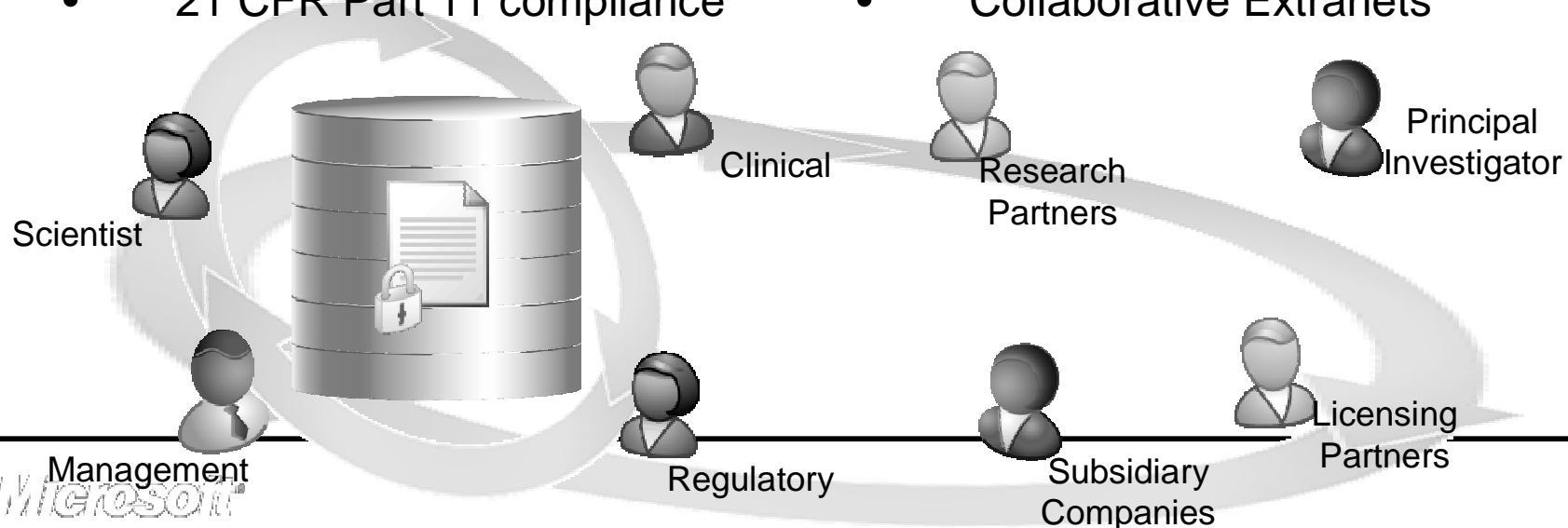
Compliant Collaboration

Compliant Collaboration

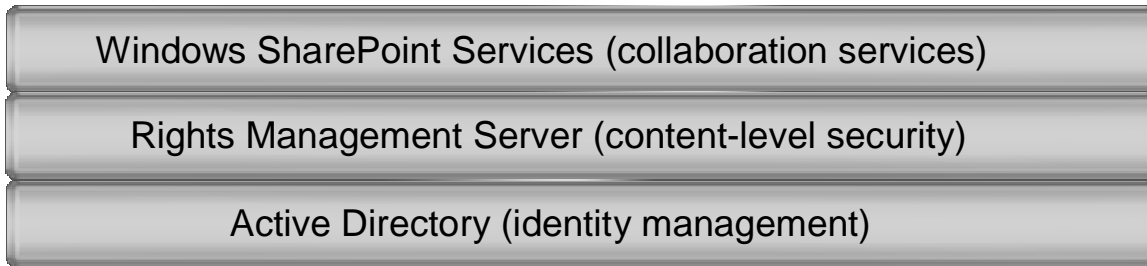
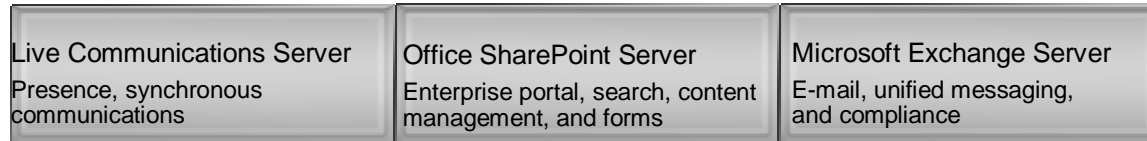
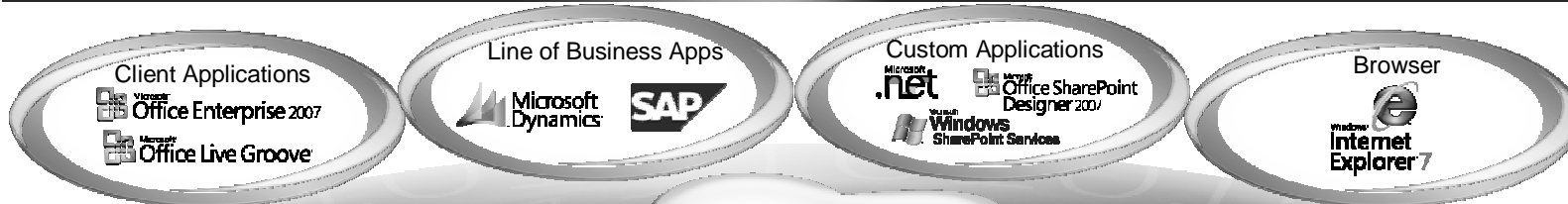
- Regulated document mgmt.
- Enterprise document mgmt.
- Enterprise metadata mgmt.
- Real-time collaboration
- Legacy systems & applications
- 21 CFR Part 11 compliance

Across Boundaries

- Internal and external users
- Business partners
- Across geographies
- Across business entities
- Single-Sign On
- Collaborative Extranets



Compliant Collaboration Location & Device Independent



} Windows Server

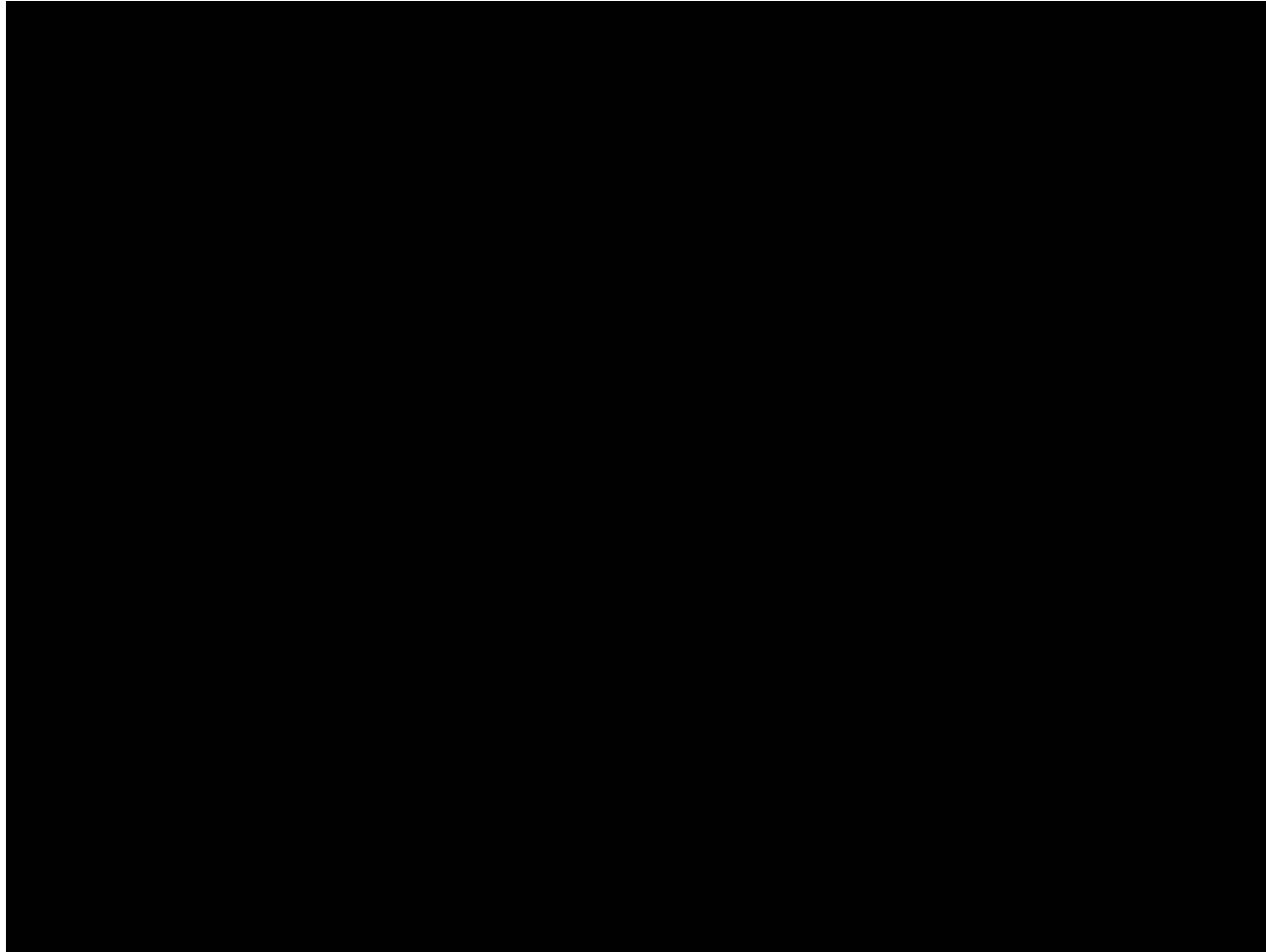


And in conclusion . . .

Microsoft in Healthcare

... a glimpse ahead ...

Microsoft in Healthcare – A Glimpse Ahead



Resources

- MSDN
 - <http://msdn.microsoft.com/architecture/lifesciences>
 - Sharepoint Configuration Guidance for Part 11
 - SAFE Signing Interface for Office 2007
- Microsoft.com
 - <http://www.microsoft.com/lifesciences>
 - Enterprise Content Management in Regulated Industries
 - Case Studies in Pharma/MedDevice/Biotech
- Bio IT Alliance
 - <http://www.bioitalliance.org>



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