

Tapping into a Massively Interconnected Knowledge Network

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BHP Billiton

Who are We?



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About BHP Billiton Petroleum

- BHP Billiton is:
 - World's largest diversified resources company.
 - Market Capitalization of US\$82 billion
 - Turnover of US\$32 billion.
 - 37,000 employees working in more than 100 operations in approximately 25 countries.

- BHP Billiton Petroleum
 - A significant oil and gas exploration and production business.
 - Principal activities are oil and natural gas production, exploration and development in Australia, the United Kingdom, the United States, Algeria, Trinidad and Tobago, and Pakistan.
 - Employs 1800 staff and direct contractors worldwide.

Global Exploration

Brunei / Borneo / Philippines / Indonesia

Pakistan

Algeria

Maritime Canada

Business Development Sphere

North Africa / Middle East / Russia Subcontinent

Gulf of Mexico

Offshore Colombia / Venezuela

Trinidad & Tobago

Namibia

South Africa

Exmouth

Carnarvon

Bass Strait

■ Existing Core Business

■ Exploration Focus Area

■ New Ventures Test Area

■ New Ventures Screening Area

BHP Billiton Petroleum Operational and Financial Review 2005

Global Opportunities



Atlantis Hull departs South Korea for the Gulf of Mexico

Global Exploration Technology

- A group within Petroleum charged with providing technical expertise in the geosciences.
- Generate technical documents in a variety of formats.
- Runs training classes and field trips.
- Needs to get information to the 'customer': the Asset Teams

Expertise

- Internationally known team of geoscience specialists
- Vision to develop a resource for the future that captured a logical model of the knowledge surrounding projects throughout their lifecycle.
- An addition to our team was required to deal with the IT implementation
- Required not only the IT knowledge to develop a solution, but the ability to grasp the essence of a subject fraught with its own jargon, and guide us to a logical end-point.
- We found the IT, and specifically Documentum, expertise in Blue Fish Development Group

The getKnowledge™ Project

Introduction to the problem, the solution, and most importantly the journey that got us there...



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Strategic Context and Guiding Philosophy

- Knowledge is undoubtedly one of our most valuable assets and is part of what distinguishes us from our competitors.
- If we are able to manage information, we are able to design ways of providing this information to our workforce.
- If we provide this information to them efficiently, we transfer knowledge, and thereby generate value.

“We spend tens of millions of dollars on data, and use it to make decisions worth hundreds of millions”

In the Beginning...

...there was a

- Pre-existing 'static' Knowledge Base
- Served over 200 users with over 25,000 files per month.
- Recognition there has been an "explosion" of information/data.
- Required manual uploading of resources to web server
- Required links to be manually maintained between relevant pages and indexes.
- Geographically organised system, but no way of sorting thematically.

The Wish List

- Should use the corporate tool-of-choice for document management.
- Should be a dynamic rather than static system.
- Documents should be dragged and dropped into the Knowledge Base by their author.
- Documents should be tagged with metadata for later retrieval.
- Based on geologically and geographically cognisant tags assigned to resources, the system will be able to create 'analogues'
- System should become a 'work area', and the primary way of interacting with Documentum for GETT.

User and Enterprise Demands

The new getKnowledge Base responds to and answers needs articulated by the business, namely the Global Specialists, other GET team members, and asset team 'customers':

- User demands:
 - Easier Upload of data
 - Easier retrieval of information
 - Improve Knowledge Sharing & Information 'Push'
 - Integration of tools (BHPViewer, ARCReader)
- Enterprise Demands:
 - Better Knowledge & Resource Management
 - Audit trail – preservation of tollgate decision documents
 - Documentum adoption

Technical Challenges

Solution validation

- ROI and time to value question
- Determination that existing search technology did not meet requirements
- Taxonomy challenges
- Tagging requirements at business user level

Resulting Strategy

- Guided navigation drive additional value
- Tagging UI development

Iterative development

- Demanding user group
- Changing requirements
- Varied workflows
- Unaware of all options

So, the Solution...

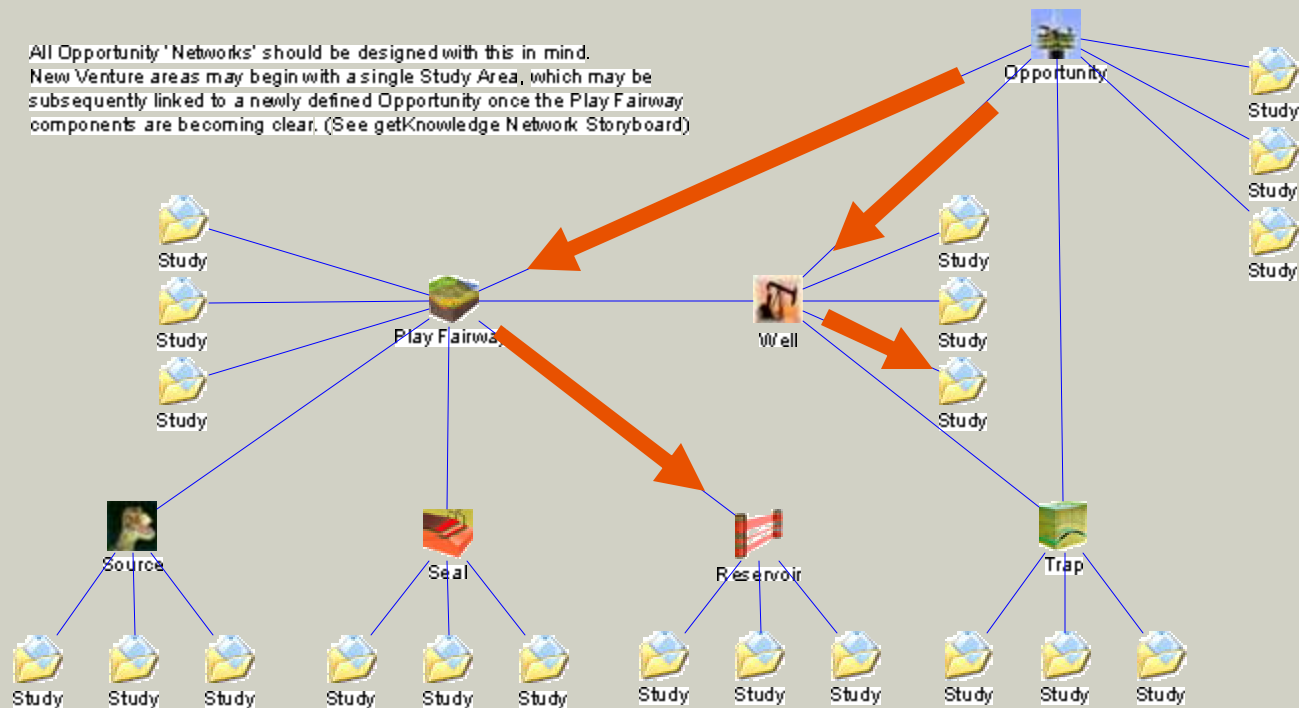
- getKnowledge™
- An evolution of the existing static website into a dynamic, Documentum-based, web application.

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getknowledge

getKnowledge™ - Concepts

'Standard', Well defined Opportunity
e.g Atlantis, Mad Dog, Stybarrow

All Opportunity 'Networks' should be designed with this in mind.
New Venture areas may begin with a single Study Area, which may be subsequently linked to a newly defined Opportunity once the Play Fairway components are becoming clear. (See getKnowledge Network Storyboard)



Note: Studies can be linked to any number of other entities.
For clarity, I have not shown these possible connections.

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Evolution of an Opportunity: T=1

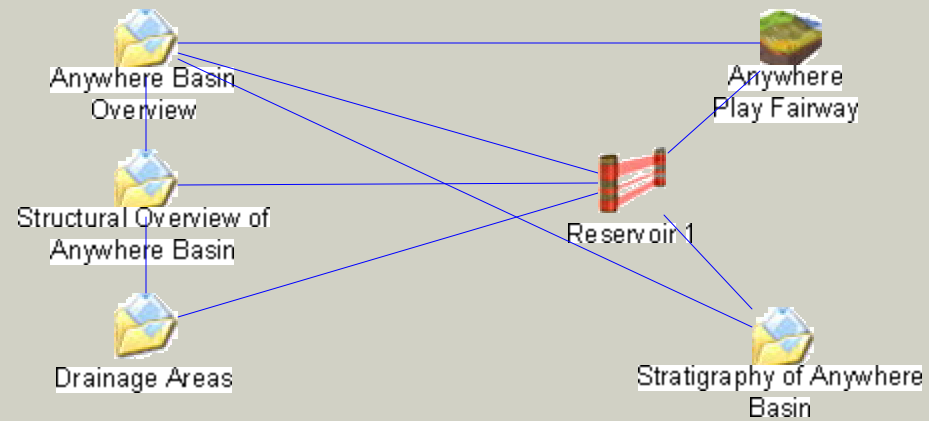
New Ventures Area  bhpbilliton
T=1 getknowledge



A single or small collection of Studies may be sufficient when moving in to a New Basin or Area. They can be linked together

Evolution of an Opportunity: T=2

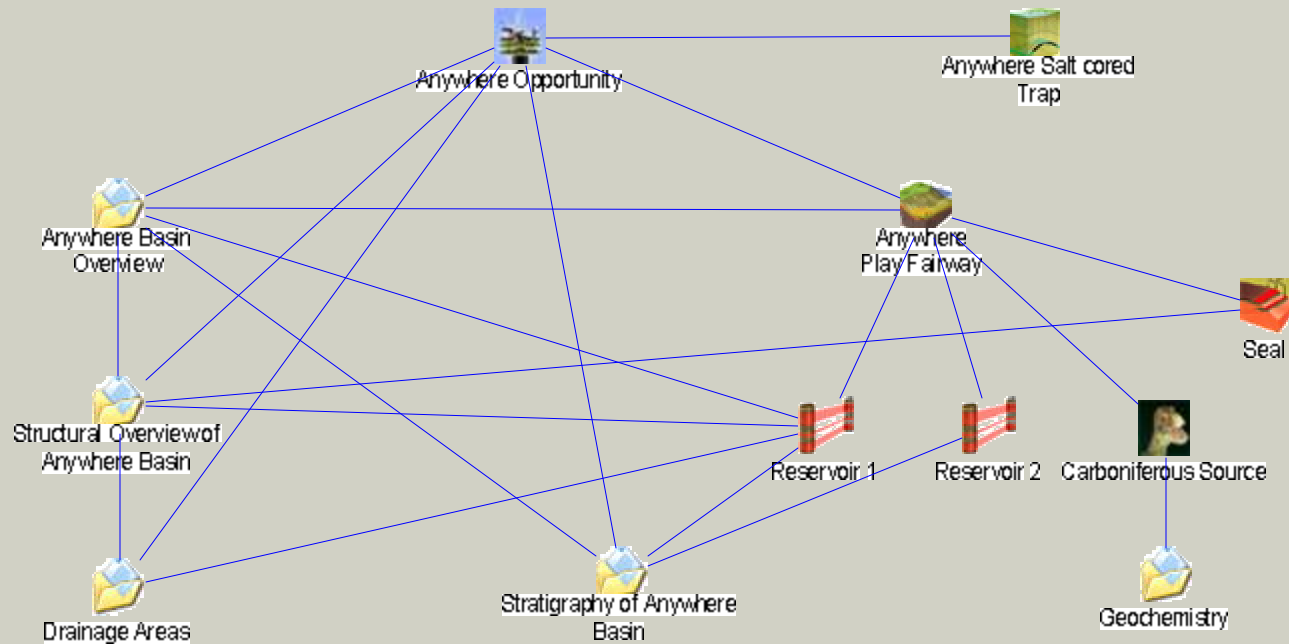
New Ventures Area  bhpbilliton
T=2 getknowledge



As the number of studies grows, it may make sense to create Play Fairway, Source, Seal and Reservoir entities to better organise the information.

Evolution of an Opportunity: T=3

New Ventures Area
T=3

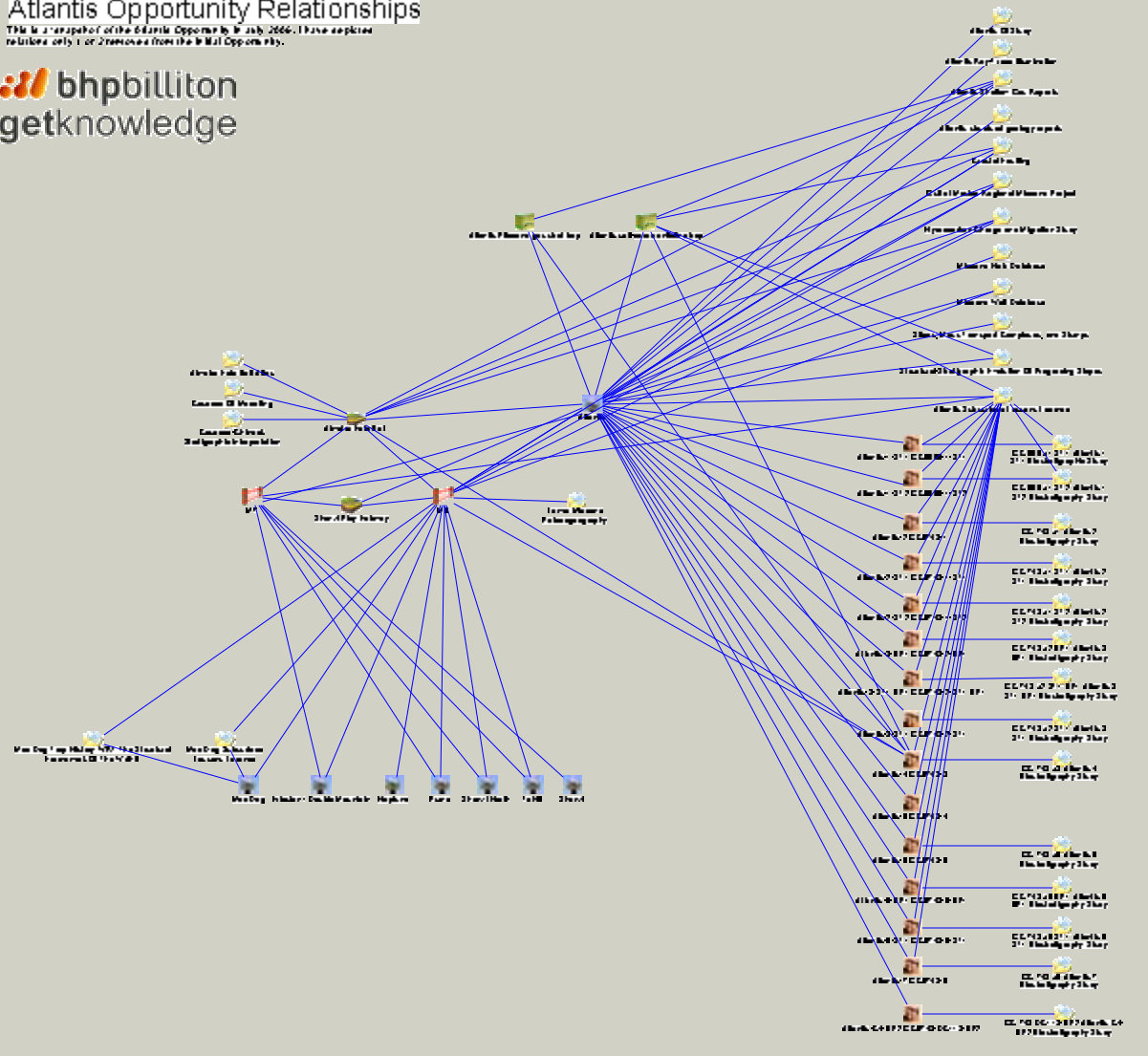


The work done in this New Ventures area is clearly forming the basis of a new Opportunity. One can be created to tie together the various Play Fairway components and all related studies. The Opportunity can be spatially refined over time, and can have its name changed, all whilst retaining the relationships it has with other entities.

View of a 'Real' Opportunity Network

Atlantis Opportunity Relationships

This is a snapshot of the 6,426 Opportunity Jobs 2006. I have explored relations only for 276 contacts from the 6,426 Opportunity.



Communicating Results Through getKnowledge™



Houston Petroleum Phone List People Directory Travel & Expenses (TEM)

Global Exploration Technology: Houston

Quick Links MyWork Actions Entity Clipboard Help

getGlobal: [Flags] getSearch: [Input] Navigate

RELATED LINKS

- Forum
- Neptune Q.I. Viewer Buttons
- spec decomp movies

Create

ANALOGS

Manual
None

System

- 2006 AAPG Houston
- An Introduction to Deep Marine Clastics
- Cabernet-Sauvignon-Merlot Stratigraphic Interpretation

Show Detail (14 more) | Manage

CURRENT NEWS ITEMS

- getUpdate April 2006

Create

NOTES AND FOOTERS

- Send page link by e-mail...

Intranet issues to Sam Clayton.
BHPB-Restricted, BHP Billiton Limited.

Logout (Clayton, Sam) | About

Neptune M9 sparse spike secant amplitude extractions (1.0)	Leslie, Damian	04/08/2005	3.1 MB
Neptune SPIKE Impedance movie (1.0)	Leslie, Damian	04/01/2005	144.3 MB

M9 horizon flattened to 6510ms M10c horizon flattened to 6810ms (as per spectral decomp)

Add Document | Bulk Upload

Raw Data Output Locations:

- Pressure data
- Raw spreadsheets used in LFP analysis
- data generated by Valerie

Add Raw Data Location

BHP Viewer Buttons

Viewer	Name	Abstract	Action
	Larger area with 4 event flattening		
	Larger area with 2 event flattening		

Movies drop Link

Web-enabled Open Source Seismic Viewing tool opens datasets direct from the web page



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Information Creation

Building a Knowledge Base



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Getting Information In

- A knowledge base is only as good as the information it contains.
- Key to getKnowledge™ is meta-data. Without it:
 - The automated matching cannot work,
 - The search engine cannot locate resources
 - The user is swamped with data.
- Meta-data can be generated:
 - Automatically
 - By the user
- getKnowledge™ operates a hybrid approach
- Users create a study (work project / package), and spend 5 – 10 minutes tagging it with appropriate meta-data.
- Documents subsequently dropped onto the study inherit defined meta-data sets.

Study Creation

RELATED LINKS

 [Forum](#)

[Create](#)

ANALOGS

Manual
None

System

 [2006 AAPG Houston](#)

 [2006 Gulf of Mexico Regional Miocene Project](#)

 [3D Basin Modeling in GOM](#)

[Show Detail \(42 more\)](#) | [Manage](#)

CURRENT NEWS ITEMS

 [getUpdate: July 2006](#)  

Cascade-Chinook Stratigraphic Interpretation

Study Type: Opportunity Appraisal

[View Documents](#) 

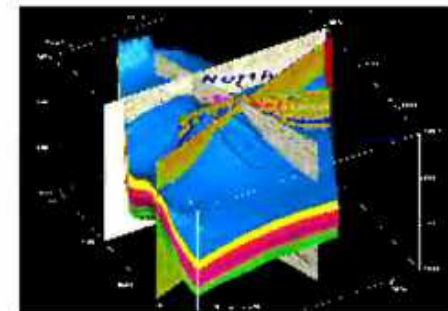
This study covers the stratigraphic interpretation over the greater Cascade and Chinook area, specifically including the various QI datasets created in an associated study.

The intent is to cover both the sub-regional extent over both Cascade and Chinook, as well as the field-scale interpretation to assist in reservoir modeling and development planning.

The study is centered over the SeisWorks "casookwg" project and the primary QI datasets used include:

- Full stack volume
- Full and far impedance volumes
- Spectral decomposition statistical volumes
- Average impedance and impedance difference volumes

Well data used includes:

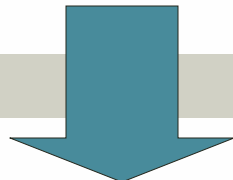


Adding Documents – Drag and Drop

Documents

No documents found.

[Add Document](#) | [Bulk Upload](#)



Documents [Show Thumbnails](#)

20 items found, displaying all items.

Page: [1]

Format	Title (Version)	Types	Authors	Date	Size
	Estimation of Permeability with Seismic - Application of Floating Grain Model to Cascade Stratigraphic Interpretation (1.0)		Lerch, Chris	06/22/2006	5.9 MB
Part 2 of three on the estimation of permeability from seismic at Cascade-Chinook, shown at one of the getLunch series.					
	Petrel Well Correlation (1.1)		Leishman, Markus	01/20/2006	824.5 kb
Current well correlation framework in Petrel					
	Cascade Seismic to Petrel Tie Points (1.0)		Lerch, Chris	01/20/2006	15.0 kb
A spreadsheet showing how the interpreted seismic intervals in the Cascade area tie to the current Cascade well correlation.					
	Cascade-Chinook Synthetic Model - Updated Body Dimensions and Properties (1.1)		Lerch, Chris	01/11/2006	60.0 kb

Attribute Inheritance

Study Attributes

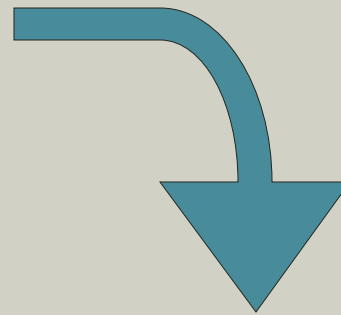
Reservoirs

- [-] ♦ Deposit
 - ♦ Composition
 - ♦ Clastics
 - ♦ Grain Size/Calbre
 - ♦ Mixed Sand + Mud
 - ♦ Process
 - ♦ Turbidite
 - ♦ Depositional Environment
 - ♦ Marine Environment
 - ♦ Basin Floor
 - ♦ Depositional Process
 - ♦ Gravitational/Mechanical
 - ♦ Mass Gravity Flow
 - ♦ Turbidity Current
 - ♦ Tectonic Setting and Structural Context
 - ♦ Compressional
 - ♦ Thrust
 - ♦ Toe thrust/fold

Traps

- [-] ♦ Structural
 - ♦ 4-way Dip

- Business rules define what attributes are inherited by object



Permit Register_Ongoing
Activities.doc
Microsoft Word Document

Analogue Matching

How do you find information that you don't realize even exists?



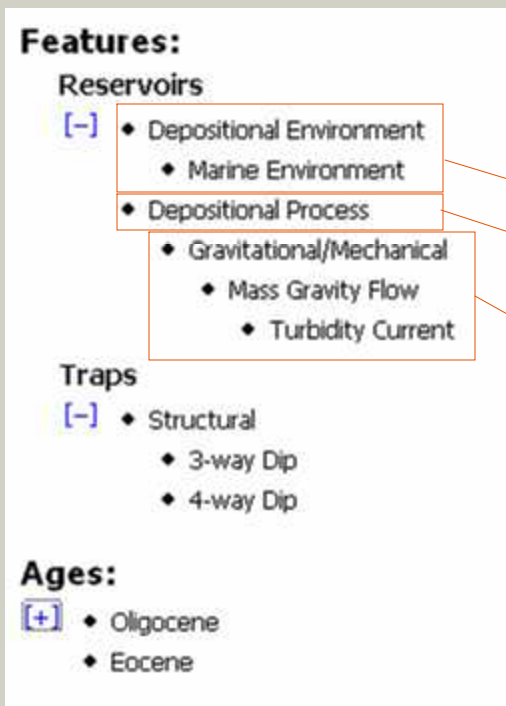
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Analogues

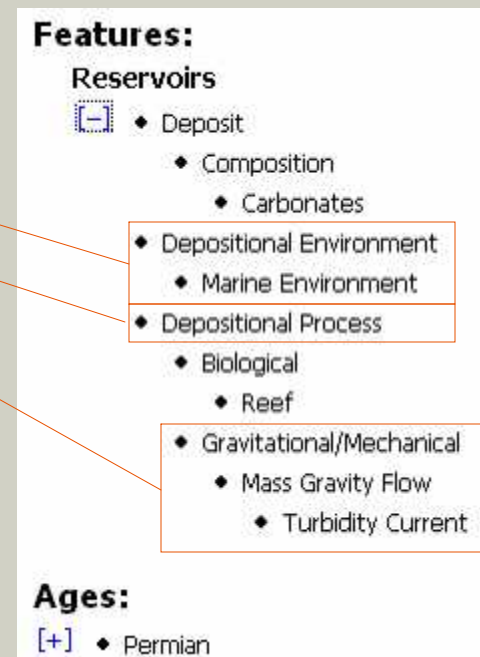
- Analogues are entities that are related geologically to each other.
- By their nature, hydrocarbon reservoirs are tough to see and touch, often being thousands of feet below the seafloor.
- A Gulf of Mexico reservoir may have similar characteristics to an outcrop in the French Alps.
- Therefore we can use the outcrop both:
 - As an excuse to visit the French Alps
 - As a real formation that may help us understand the processes that created it, and hence what its continuity, structure and properties tell us about the inaccessible reservoir deep beneath the Gulf of Mexico.
- getKnowledge™ can be a repository for this information, and can help draw connections between objects that the user may not even know existed.

The Analogue Matching Process

Study 1 – French Alps



M7 Reservoir, Gulf of Mexico



Score = 6 → Analogue Match

Retain and Promote Specialist Expertise

- We display matched analogues on every page – like a 'see also'.
- Can be managed by specialists – pin excellent analogues to page.

The screenshot displays a web application interface for a document titled "Neptune Quantitative". The document is categorized under "Study Type: Opportunity Development". The main content area shows an "Abstract:" section with the text: "Documentation of Neptune field quantitative on a number of different dataset versions. This has better imaging near salt." Below the abstract, there is a "Location:" section with "Region: Americas" and "Subregion: North America".

On the left side, there are several panels: "RELATED LINKS" with items like "Forum", "Neptune Q.I. Viewer Buttons", and "spec decomp movies"; "ANALOGS" with a "Manual" section (None) and a "System" section listing "2006 AAPG Houston", "An Introduction to Deep Marine Clastics", and "Caber... Str..."; "CURRENT NEWS ITEMS" with "getUpdate"; and "NOTES AND COMMENTS" with "Ser...".

On the right side, there are similar panels: "RELATED LINKS" with the same items as the left; "ANALOGS" with a "Manual" section listing "Baja California Knowledge Base" and "Gres D'Annot", and a "System" section listing "2006 AAPG Houston" with a "Manage" button; and "CURRENT NEWS ITEMS" with "getUpdate: July 2006".

A blue callout box with a pointer to the "Manage" button in the right-hand "ANALOGS" section contains the text: "‘Manage’ – allows specialists to edit the auto-generated and manually identified analogues."

Analog Search

[Start a New Search](#)

- Hydrocarbon Systems: [Re](#)
- Technical Disciplines: [Pe](#)

Select search criteria below to narrow

Text Search

Go

Study Types

Hydrocarbon Systems

- 1 Basin Floor
- 1 Shelf
- 2 Slope

Geographic Regions

Ages

Created / Modified

Done

Edit Analog

This page allows a user to edit an analog.



Neptune Quantitative Interpretation



2006 AAPG Houston

Added By:
bluefishadm

Comment (< 255 characetr):

Created by system analog
heuristic.

Save

Cancel

Done

ep shelf play test.

Block 3a in March 2004



Building a Geological Model

Ways of organising information change, but geology does not *

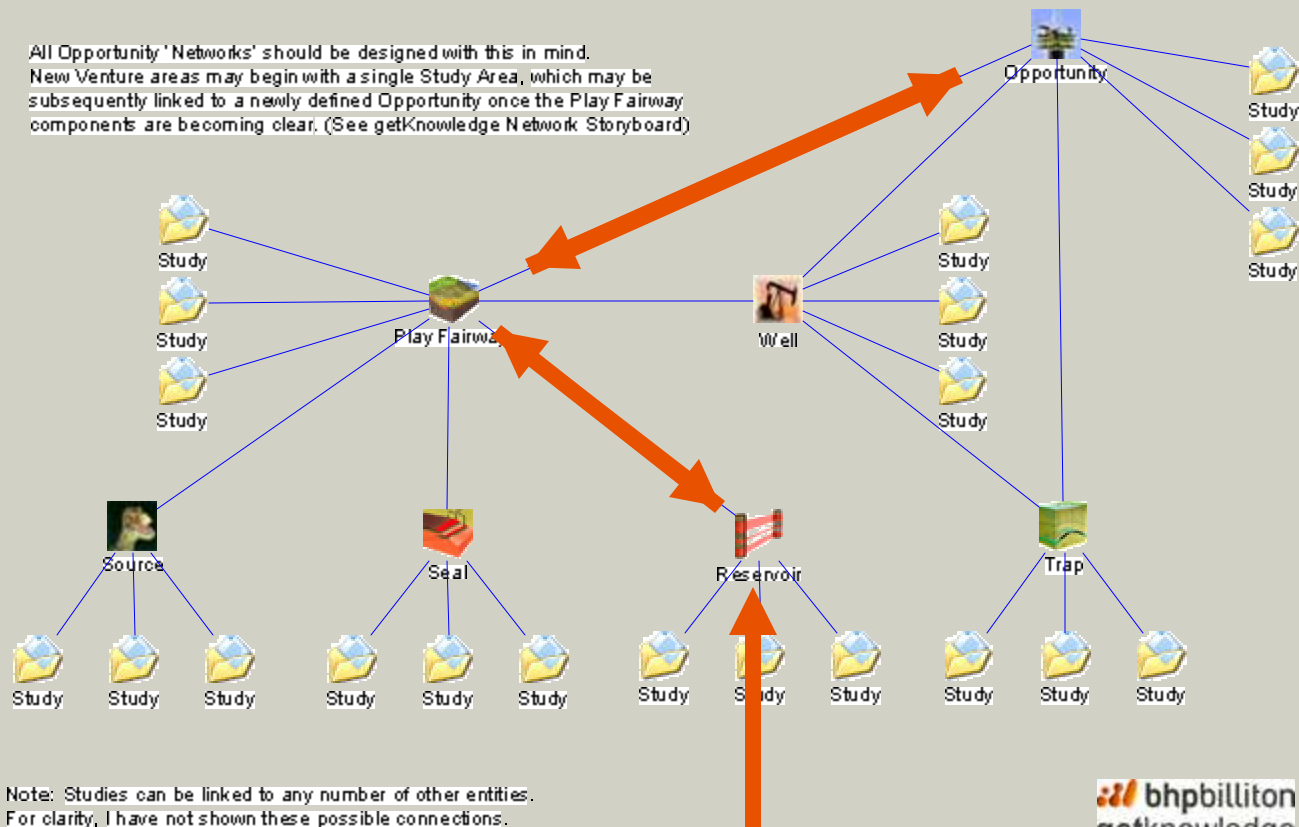
* Well, it does – but takes a couple of million years. Longer than we have here...



getKnowledge™ - Concepts

'Standard', Well defined Opportunity
e.g Atlantis, Mad Dog, Stybarrow

All Opportunity 'Networks' should be designed with this in mind.
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Recovering Information

Searching getKnowledge™



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Searching getKnowledge™



Houston Petroleum Phone List People Directory Travel & Expenses (TEM)

Global Exploration Technology: Houston

Quick Links MyWork Actions Help

getGlobal: [Flags] getSearch: [Input] | Navigate

CURRENT NEWS ITEMS

Mass Transport Complexes - [Icons]

Create

NOTES AND FOOTERS

Send page link by e-mail...

Intranet issues to Sam Clayton, BHPB-Restricted, BHP Billiton Limited.

Logout (Clayton, Sam) | About

Advanced Search

Select search criteria below to narrow your search.

Text Search

- BHP Types
- Asset Teams
- Technical Disciplines
- Geophysics
- Play Fairways
- Hydrocarbon Systems
- Geographic Regions
- Ages
- Created / Modified

(Geographic Area, Geologic Age etc) and see what's available to you...

Can't Find Stuff? Please Read This

The annotated scenario images [here](#) attempt to explain the possibilities this interface offers.



You are able to slice the resources using the dimensions subtly indicated by the Big Red Arrow on the left.

If you're looking for a particular piece or collection of work, click on BHP Type, and then Study. Now you're just looking at Studies. These tend to be well consolidated 'packages' of information for a particular project - i.e. a Biostratigraphy Study for a particular well, or a Study of a whole Basin.

You can refine these further by the other dimensions that you see - they are updated every time you enter more keywords, or click on another dimension. You therefore don't end up with zero results.

Maybe you just want to look for 'contacts'. Again, under 'BHP Types' you can choose the type of entity you are looking for. If you're not sure, narrow down by other dimensions first

Stumbling Blocks

Life isn't always easy



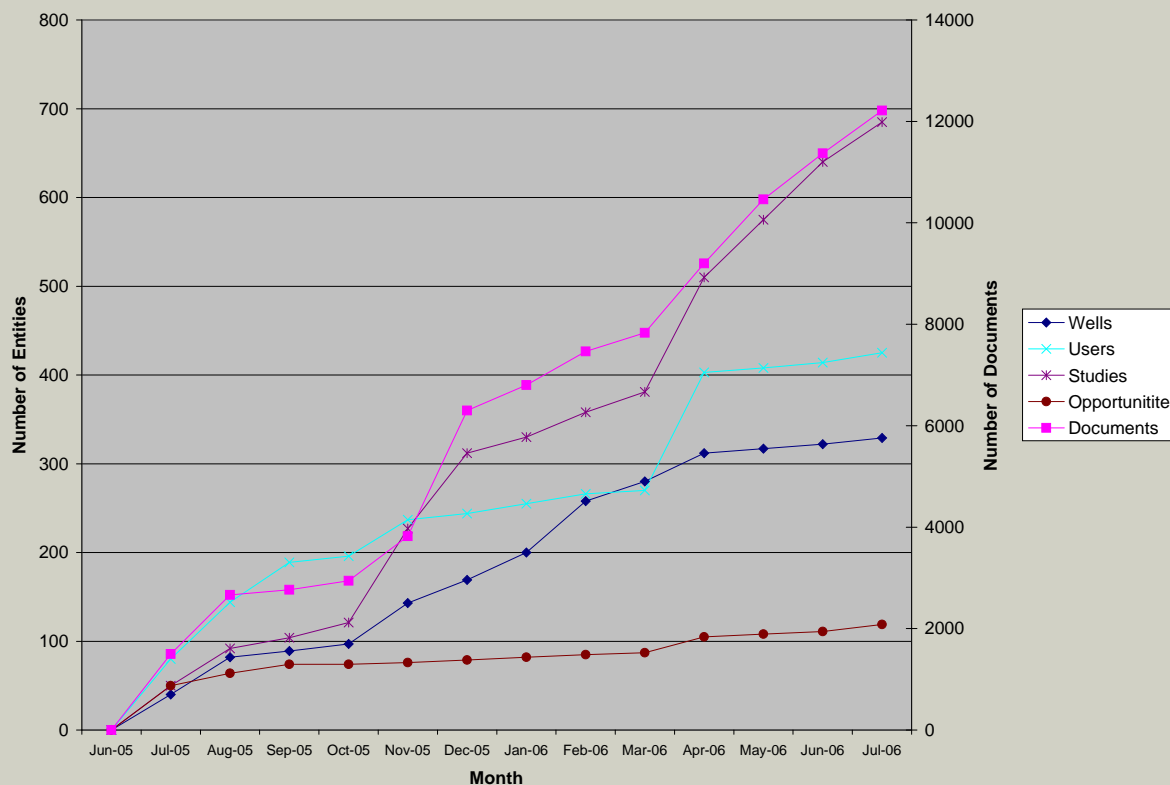
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Where we had (and have) work to do

- Content Replication – not yet in production between Houston, London and Perth
- Folders are dead, long live folders!
- Explaining the concept of tagging resources, and why it can be worth it.
- Increasing flexibility of getKnowledge™
- Improving reliability and performance of underlying systems

Wrapping Up

- getKnowledge fosters knowledge sharing.
- Significant growth in Global exchange of information
- Users enthusiastic about publishing data – increases visibility.
- Seen a significant growth of 'objects' stored.



Additional Blue Fish Solution Presentations

Today!

Solvay Pharmaceuticals and Blue Fish:
Importing Large Sets of Content from Trusted Partners into Your Repository
Track 9: Room 201CD 5:00-6:00

Planview and Blue Fish:
Using Web Services to Integrate a .NET Solution with Documentum
Track 8: Room 204A 5:00-6:00

Tomorrow!
Bausch & Lomb and Blue Fish:
Leveraging Web Content Management to Enforce Your Master Brand
Track 4: Room 210AB 11:30-12:30

Thursday!
Lockheed Martin and Blue Fish:
Power to the People - Enabling Every U.S. Citizen to Participate in Federal Rule Making
Track 3: Room 208 11:30-12:30

Allergan and Blue Fish:
EMC Documentum Compliance Manager Migration Revisited – What a Difference Two Years Makes
Track 10: Room 201AB 3:15-4:15



Follow Up With Blue Fish

Visit Booth 634 in the Exhibition Hall — You might just win a Blue Fish Signature iPod Nano!

Call the Blue Fish Momentum Hotline to set up your own meeting –
512.940.5201

Catch us via email dave@bluefishgroup.com or check out
www.bluefishgroup.com for more information.

The Future

Ever evolving technologies



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Google™ Earth Enterprise and getKnowledge™

[Launch Movie](#)

Presentations Will Be Available on
the Momentum 2006 Website

www.momentumlive.com

Password: *forum*



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Blue Fish Development Group

Who are We?



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Blue Fish Development Group

Focused on ECM

We help companies manage and extract value from their intellectual assets

Experience

In our 7th year of building software solutions for difficult business problems

Expertise

Recognized as experts in Endeca, Documentum, and solution development

Client Centric

"Be Smart, Be Nice, Get Things Done"

Blue Fish Focus

Retail



FOSTER & SMITH



Energy



Pharma & LS



Other



Endeca – Information Access Platform

Documentum – Enterprise Content Management Platform

Blue Fish Focus

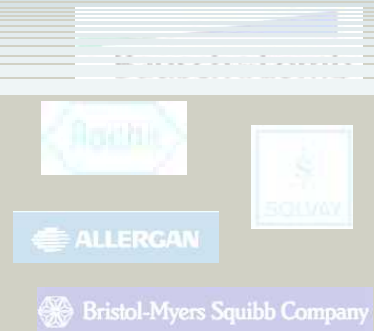
Retail



Energy



Pharma & LS



Other



Endeca – Information Access Platform



Documentum – Enterprise Content Management Platform