CDA

part of

Oil & Gas UK

The business value case for data management - a study

Results

Schlumberger

Background

Common Data Access Limited (CDA) is a not-for-profit subsidiary of Oil & Gas UK, the leading representative body for the UK offshore oil and gas industry.

During 2010 CDA commissioned Schlumberger to study the 'Value of Data Management'. This study included interviews with senior executives, a search of related literature, a roundtable meeting and a variety of other inputs all designed to illustrate the high value of Data and Data Management to working exploration and production companies.

In the course of the study input was provided by staff at CDA, Schlumberger and a wide range of other organisations. In particular the authors would like to thank staff from the following organisations for providing invaluable insights:

Apache	BG	BP	Centrica	Chevron
ConocoPhillips	Dana Petroleum	DONG Energy	EnQuest	Fairfield Energy
First Oil	Ithaca	Noreco	NPD	Petoro
Premier Oil	Shell	Talisman Energy	Total	UK DECC

This is the "Results" document. It is one of the four documents delivered by the study:

Results	Roundtable	Related Literature	Process
The value that data management and data deliver to E&P companies	A discussion held between senior oil executives about data management	A survey of the documents about the value of data in the oil industry	A description of the process that was followed during this study

All four can be downloaded from the Oil & Gas UK web site at:

http://www.oilandgasuk.co.uk/datamanagementvaluestudy/

About the authors

Steve Hawtin joined Schlumberger in 2001 where he has consulted on a wide range of Information Management engagements. For more than 10 years before that Steve worked for Oilfield Systems Limited where, as Technical Director, he was responsible for the creation of products such as GeoScene, DAEX and Quadrate.

David Lecore has worked in the Oil and Gas industry for 25 years, working initially for major operators and then joining Schlumberger in 1997. David's work in Schlumberger has focused on both Information Management and Knowledge Management, concentrating on the governance, process, strategy and value aspects as opposed to technology solutions.

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Introduction

The way subsurface data is handled can have a significant impact on the overall performance of exploration and production (E&P) organisations, all oil companies understand that data is crucial to their operations. Corporate officers are aware of how important this is, and yet many data handling professionals report that their ability to effectively manage data is being hampered by a lack of investment.

Is this perception fair? Are there really attractive opportunities to dramatically improve overall oil company performance by investing more in data management? Or is the current spending level appropriate? This report describes the results of a study commissioned by CDA to explore these questions. This paper was made possible by the support of CDA and Schlumberger, in addition senior executives from the following participating organisations provided invaluable insights:

Apache	BG	BP	Centrica	Chevron
ConocoPhillips	Dana Petroleum	DONG Energy	EnQuest	Fairfield Energy
First Oil	Ithaca	Noreco	NPD	Petoro
Premier Oil	Shell	Talisman Energy	Total	UK DECC

This report starts by estimating the value that data generates within E&P companies. It then reviews the most important themes that emerged from the interviews before suggesting areas where improvements are commonly to be found. All E&P companies are generating value with their existing data management, the important question is whether there are compelling business cases to expand on their current capabilities.

The study focused on the information related to the subsurface. This data ranges from exploration data, such as seismic surveys to production data, such as hourly flow readings, and from objective measurements, such as raw log readings to interpreted results such as dynamic reservoir models. The key reason that oil companies employ these categories of data is in order to reduce the "geological uncertainty" that inevitably arises from a lack of direct evidence of the subsurface.

The final conclusion is that all oil company personnel should carefully review their current data management. In most companies there are opportunities to expand the governance, access, security or quality of data which would significantly increase the total value an organisation generates.

Value Based Management

It is reasonable to start by assuming that the goal of any organisation is to generate the maximum benefit from limited available resources. Rational managers have to balance how much they spend on various activities. In an oil company, for example, spend on facilities construction, staffing, production intervention, data acquisition and data management must all be proportionate.

In a perfect world this would mean that budgets would be allocated to different functions based on their "expected rate of return". When additional budget becomes available it should be given to the department that would have the most positive impact on overall value.

However, even in a simple case, finding the optimal spending balance can present a challenge. In the picture below an extremely simple model of an oil company was exercised with various combinations of spend on three key areas. As the results show even this straightforward model does not have a single simple optimal strategy.

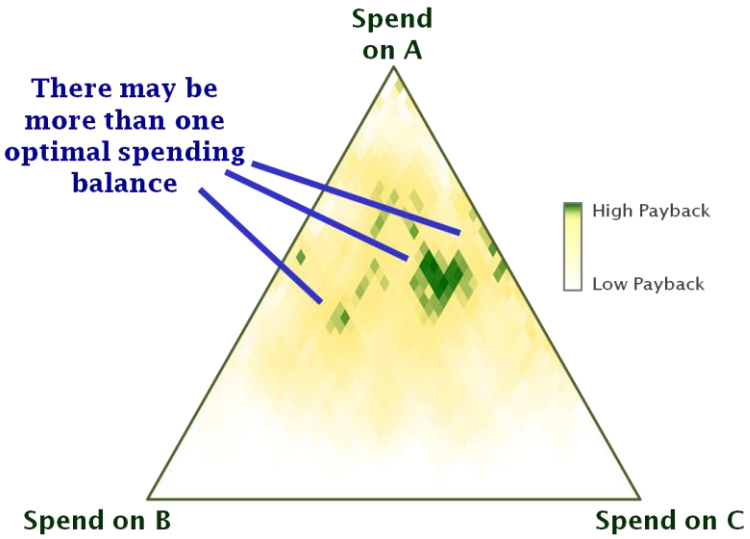

Figure 1: There may be more than one optimal strategy

In the real world, not only is it impossible to experiment with a range of different strategies it is even challenging to tease out the impact of changing a single aspect of the business. The senior executives who decide how to divide up the limited total budget rarely have a background in data management, so it must be up to the data management specialists to demonstrate the real impact that their discipline has on the company's overall performance.

The goal of data management is the timely delivery of relevant information of a known quality in order to inform business decisions. So to understand the optimal amount to spend on this activity one must first understand the value that data currently delivers, and the potential ways that this can be diminished or enhanced.

The "International Valuation Standards Council"[1] suggests that there are three ways to come to a valuation of an intangible asset such as petrotechnical data:

- **Direct market comparison:** identify a "market" where an equivalent is available and use it to estimate a fair price
- **Profit:** Identify the current and future benefit that the company derives from the asset, and use that to estimate a level of investment that would deliver an equivalent yield
- **Cost:** Identify the complete cost to acquire, maintain and if necessary replace the asset

The most reliable estimates of the value of intangible assets would come from the price paid in an open market to obtain it. However while petrotechnical data may be exchanged as part of a company acquisition or a farm-in this almost inevitably combines the data with other assets and makes isolating the data's value impossible.

[1] "International Valuation Standards Council" is a body set up to ensure that consistent standards are applied for inclusion in financial statements, whether for regulatory compliance or to support secured lending and transactional activity. Their standard IVS 301.02 describes how to estimate the value of intangible assets.

The value that data generates

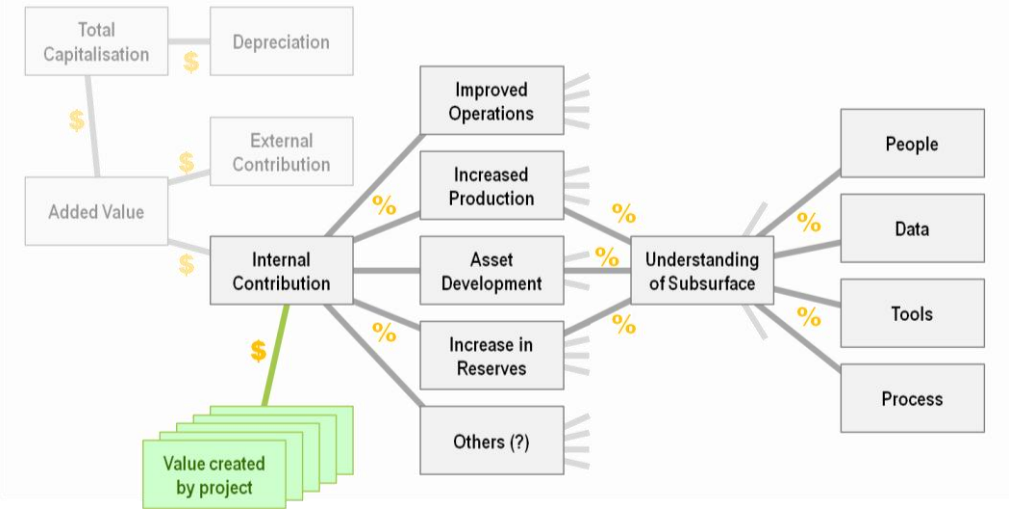

Figure 2: Simplified model of data value

This study adopted the simplified model of value generation shown above. Within this picture the company creates value by participating in a range of projects. The projects most reliant on data can be characterised as being focused on three main goals, "Increasing Production", "Increasing Reserves" or "Developing Assets". Each of these tasks is affected by a variety of factors, one of which is how well a company understands the subsurface. This understanding in turn arises from a combination of the people employed as experts, the data available, the tools utilised and the processes adopted.

So the value that data delivers can be estimated by exploring four elements:

- The total value delivered each year by projects
- The company's balance between exploration, production and development
- The contribution that knowledge of the subsurface delivers to these activities
- The extent to which interpretation of the subsurface is dependent on the data

These questions were explored by interviewing senior oil company managers none of whom were data management specialists. Each of the participants was asked about these four aspects during the interviews, the value that data is delivering to each organisation was estimated by combining these answers.

The value of projects

The financial value delivered annually by each participant in the study varied from company to company and role to role. The values ranged from tens to hundreds of millions of dollars total value per year.

In some cases it is easy to understand the value a particular project generates, for example if a prospect required $6M of total investment and, once the reserves had been proved, was sold to another company for $54M then the total value created would be $48M. If this particular field took 3 years of effort to get to this point then the value generated comes to $16M/year. If in turn the "Exploration Department" completes two projects of this size in a typical year then that group delivers $32M of value to the company each year.

In the case of a mature producing field it may be easier to consider the anticipated decline. If no interventions were made for a year it could be that production on a 50,000 barrel per day field would

be expected to drop by 10% per year. A company may arrest this decline by drilling additional wells and performing other interventions, perhaps with a total cost of $30M. The value this work generates is the anticipated loss of production less the cost of intervention. At, say, $40/barrel that would be just over $40M in total. Of course if the operator in this case has partners a proportion of this benefit will be passed to them.

The balance of activities

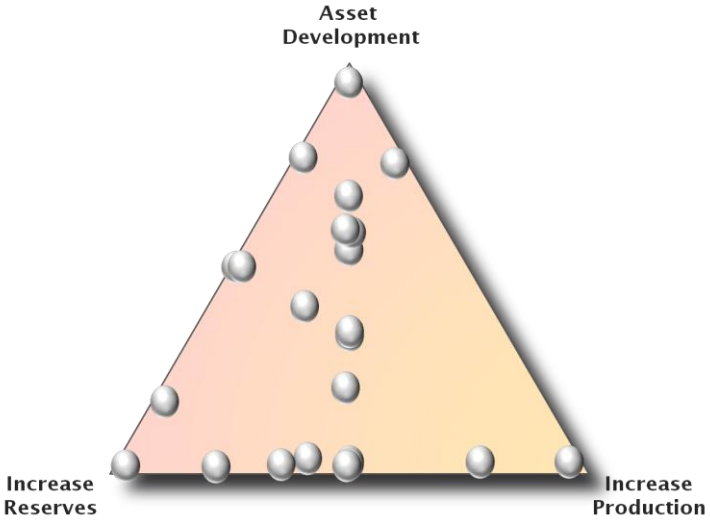

Figure 3: Different oil companies adopt distinct strategies

Oil companies adopt a range of different business strategies. For example one may focus on exploring for new discoveries, another may specialise in optimising production and a third may invest in developing assets to bring them closer to creating revenue. The diagram above shows how the study participants each balanced between these goals, this picture illustrates the range of different roles that the 22 participants have adopted.

The contribution of the subsurface

The impact that a company's understanding of the subsurface has on its business goals varies from one situation to another. During this study it was assumed that each of the three goals defined above would be influenced to a different degree by the subsurface understanding.

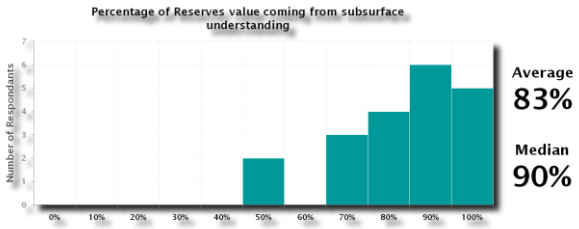

Figure 4: Impact of subsurface on Reserves Replacement

Those that described reserves replacement as one of their key goals were asked to estimate the impact that understanding of the subsurface had on that activity. The results are shown above. All participants estimated that its influence was at least 50%. The majority of participants suggested that at least 90% of the value of increased reserves came from understanding the subsurface.

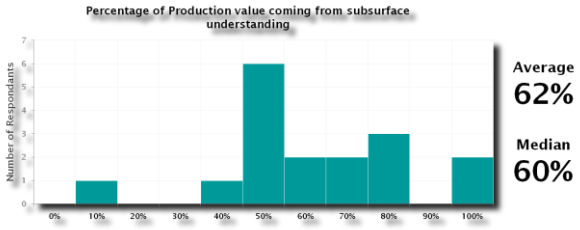

Figure 5: Impact of subsurface on Production Improvements

In contrast the value that subsurface understanding brought to increased production was generally held to be somewhat lower. Many interviewees mentioned the fact that technical innovation and business factors, such as the business relationships with partners, were also major factors. Even in this case however most participants felt that the contribution was more than half the total.

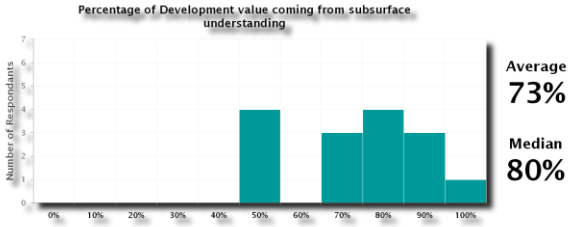

Figure 6: Impact of subsurface on Asset Development

Somewhat predictably the contribution of subsurface understanding to asset development was felt to lie between the two other activities.

Combining the various corporate strategies with the estimates of value the participants in the study on average felt that more than 70% of the value their teams generated came directly from their group's understanding of the subsurface. Given that the study specifically focused on talking to senior managers in charge of exploiting subsurface resources this should not be a surprising finding.

The interpretation process

The next step is to understand the crucial elements involved in creating the subsurface understanding. The simplified model suggests that this arises from a combination of four components: the people, the tools, the data and the processes they employ.

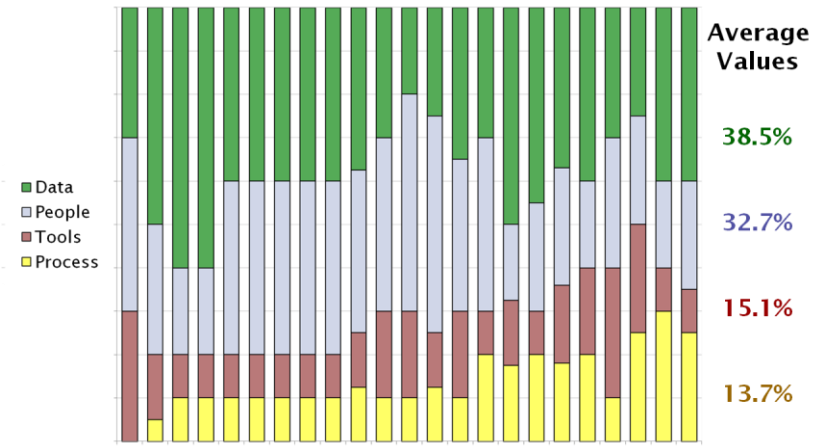

Figure 7: Participant's individual estimates of what creates subsurface understanding

All of the executives interviewed felt that splitting the interpretation process into these four components provided a reasonable overview. They each assigned different proportions to the four

elements. As the picture above shows most participants emphasised the roles of people and data and felt that tools and processes had a lesser impact.

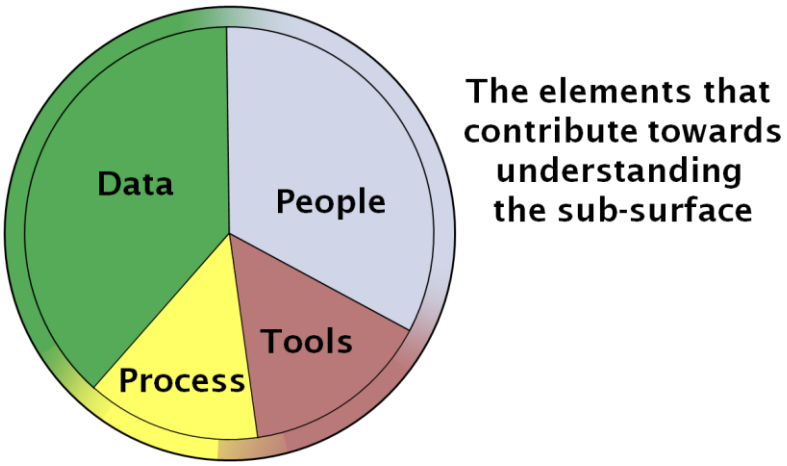

Figure 8: Overall estimates of contribution

These findings are summarised by the pie chart above. This shows that, of the four elements, the majority opinion was that data was marginally the most important.

Resulting Value

Up to this point the strategic balance, the impact of subsurface understanding and the elements that contribute to it have all been estimated in isolation. Combining them together provides an estimate of the impact that data has on an E&P company's total performance.

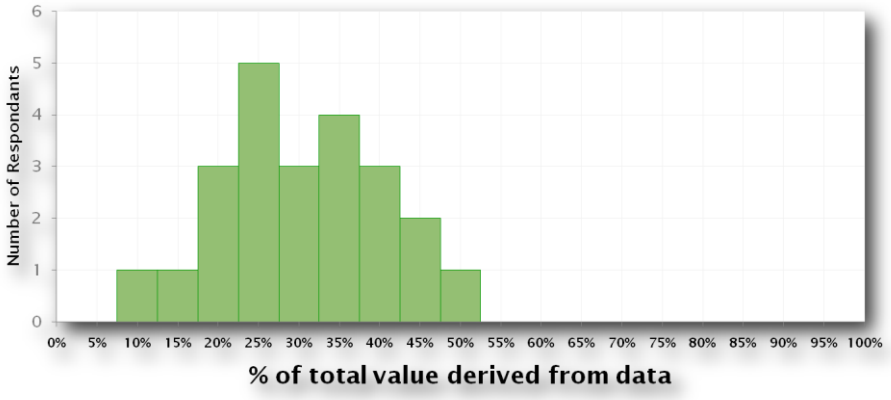

Figure 9: Participant's estimates of the contribution of data to total corporate value

The conclusion from the senior oil company staff interviewed is that data contributes between a quarter and a third of the total value generated each year by all the activities of a typical E&P company. So in an asset team that is generating $100M of value a year, for example by arresting the production decline of a field, a value of $25M-$33M a year is derived from the petrotechnical data it holds.

Unexpected Data Value

The day-to-day manipulation of data delivers a high value to E&P companies every year. However this estimate comes from the expected use of the data, there are also some specific occasions when data leads to unexpected benefits. During the course of this study a number of these cases came up.

One might anticipate that once a field is depleted the associated data is no longer of any value. However there are a number of fields in the Southern North Sea that, while they no longer have viable reservoirs of hydro-carbons are being discussed as possible locations to sequester carbon-dioxide or to store gas. Knowledge of subsurface geometry is one of the key factors to make these possibilities viable.

The most extreme case encountered concerned data that was thought no longer valuable 20 years ago. In the UK many coal mines were closed down when they were deemed to not be economic. The "Coal Board", who was the body responsible, decided that any interpreted data should be disposed of since it had ceased to be of any value. Recently it has been realised that the coal beds could be an economically viable source of methane. The companies involved are now actively seeking hand drawn subsurface maps that were surreptitiously kept by ex-miners for sentimental and artistic reasons.

The Staffa Field in the North Sea is another well documented case[2]. The field has had four operators; the company who discovered it in 1985; the company who brought it to production in 1992, but then applied for cessation of production in 1999 after producing only 13% of STOIIP due to wax or wax hydrate problems in the export pipeline; a third company who took over the licence, only to relinquish without further activity in 2006. The fourth operator has managed to overcome the wax issues, due in part to a re-evaluation of crude oil samples found to be still in storage. The lesson here is that data, even for fields that have been through cessation of production can reveal unexpected value.

A company who had taken over a large mature North Sea field from its original operator put together a program to rejuvenate the field and commenced a program to re-create the reservoir model. They soon identified short-falls in data reliability in both recent and historic data[3] and had to do considerable work to improve data quality; however other 'model build activities' involved data mining for a number of data types not applied in the field for some time. Although the original operator had not been fully applying these data types they had fortunately continued to collect them and with some work the data could be found, often buried in boxes in a 3rd party store. These data types have proved to be a valuable contributor to the new reservoir model. The lesson here being that had the original operator not continued to capture and store the data, the current operator could never have added value it has.

Issues of confidentiality and space have limited the number of cases we can outline here, however anyone experienced in the E&P industry will have their own list of cases where data has had an unexpected high impact on the value a project has delivered.

Cost of data

Given that data delivers significant business value to the company it is obvious to ask how much it costs to obtain it. The costs vary from one data category to the next, however these can be grouped into two sets: data that comes from direct measurement; and that from interpretation processes.

[2] See http://www.fairfield-energy.com/pages/view/staffa

[3] Pyle J. "Forties Field: Data Management to Full Field Simulation" (2010) presented at the SIS Global Forum 2010

Measurements

In the case of direct measurements, such as seismic surveys, well log curves and production measurements, these costs are well defined and relatively easy to estimate. Many of the companies interviewed employ a "Value of Information" (VoI) process when acquiring significant data sets such as seismic surveys, well log data, even reprocessing of existing seismic. This process creates a business case for acquiring the data where the company considers the cost of the data and a specific question it would address.

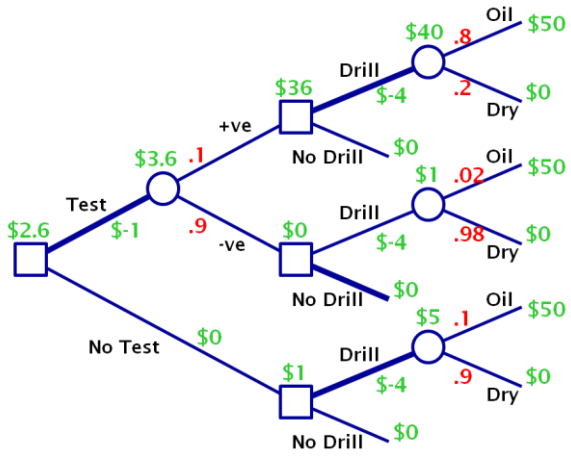

Figure 10: Decision trees help support the business case for data acquisition

In most VoI processes the business case for acquiring data is tied to a particular question that the target data will answer and, this value will often be realised within a few months of the data being available. Data is often acquired to meet a very specific need. However in most cases it will also help clarify other issues, and in some cases it may deliver completely unexpected value. The VoI process usually ignores these additional sources of data value.

The costs of purchasing some data is closely monitored and widely understood, however the data obtained, the "raw measurements", can only be understood by technical specialists.

Interpretations

The data that has the most direct impact on business decisions, such as static geological models and dynamic reservoir models, are the result of combining a wide range of evidence using the skill and judgement of experienced staff. The cost of obtaining these interpreted results is much more difficult to estimate. Any attempt to do so would have to be aware of all the contributing elements and the cost of the interpretation process.

It is noticeable that for the unprocessed data it is simple to estimate the costs, but complex to understand the impact, while for the interpreted data understanding the business impact is easier but the costs are more difficult to calculate.

Key Themes

Over the course of this study a large number of different aspects of data handling were discussed. A small number of these emerged as consistent themes. There are many factors that influence the optimal strategy for data management, this section focuses on the ones which senior managers should consider.

At the start of the study a number of themes were explored which in the analysis did not prove to have a significant impact. These included whether a company was publicly quoted or privately held or how much competition each organisation felt it had. The location of participating companies was primarily within the UK, however experience from other markets suggests that the role that data plays, the importance placed on good data management and the levels of spending are similar in the UK to many other regions.

Oil companies each have their own balance between exploration, production and asset development. As has already been seen the participants in the study span the complete range of possible combinations and, there are clear differences in the importance placed on different categories of data, however there were no systematic differences in the way that data was handled across this spectrum.

Data lifetime

When measuring the impact of data management it is important to be aware of how long data continues to generate value. If a measurement is only relevant for a short period of time then deploying scarce resources to keep it for long periods is clearly not justified. The anticipated lifetime of data depends on the category of data. In the course of this study three distinct groupings emerged: seismic data; measurements from wells; and interpreted data.

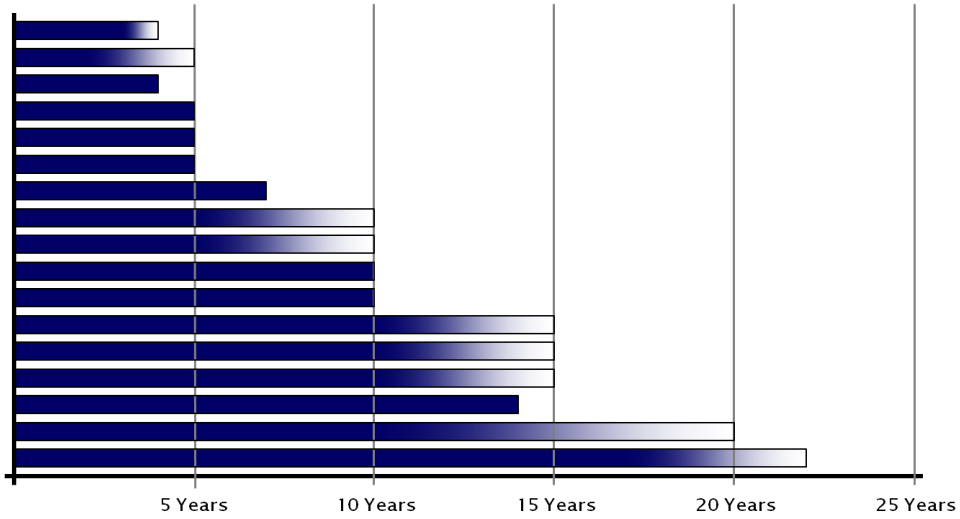

Figure 11: The expected valuable lifetime of seismic data ranges from 4 to 20 years

When participants were asked how long they expected to keep getting value from seismic they gave answers ranging from 4 to 20 years. This is based on the fact that innovative seismic technologies are being created which make it more cost effective to re-shoot a survey than attempt to reprocess it. Seismic acquired more recently usually supersedes older surveys.

In contrast, when the same question was asked about measurements from wells, the universal answer was that this data would continue to be valuable for the lifetime of the field. It didn't matter whether those were well logs taken early in its life, continual readings such as production numbers or occasional measurements such as well tests. Well curve data acquired in the 1970s is still continuing to deliver insights into some fields in the North Sea. Even if this data appeared not to be delivering value the UK government imposes some legal obligations on making the data available for future analysis.

The interpretations, such items as static and dynamic models of the fields, have a more varied perceived lifetime. Some of the respondents were aware that interpretations that influenced major

decisions should be available for future scrutiny. However even where it was acknowledged that this need existed there was an awareness that it is not currently being met.

Company Size

Oil companies range in size from a few people that can sit in a single room to some of the largest organisations on the planet. It is not surprising to find that they take different approaches to managing their data. In selecting which companies to talk to and who to talk to within them, this study deliberately attempted to sample as diverse a range as possible.

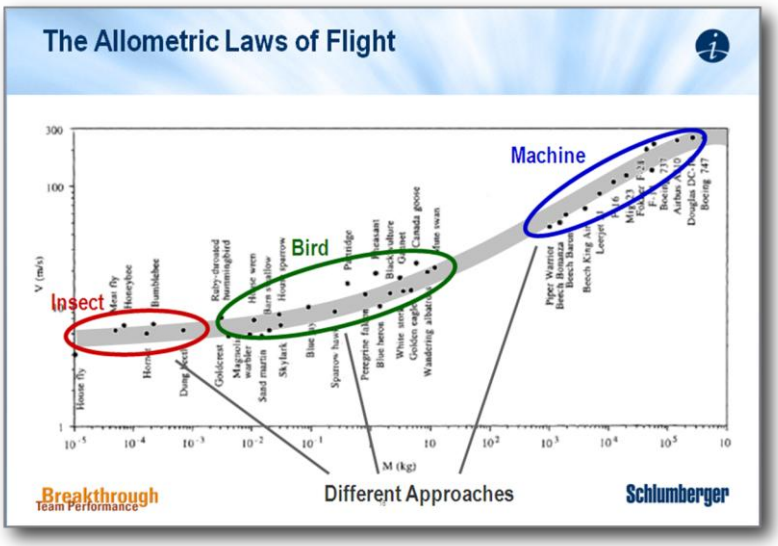

Figure 12: Distinct approaches enable flight in different size ranges[4]

Insects, birds and airplanes all employ different technologies to allow them to fly, a bee scaled up to the size of an Airbus A380 would collapse under its own weight. Similarly the best implementation of data management obviously varies according to the size of the company involved. A small organisation can take a more flexible approach that would result in chaos in a larger group, a large organisation can invest in defining precise practices whose imposition would paralyse a smaller one.

These radical differences meant that this study focused on the resulting performance metrics, rather than on individual implementation details. With flight the underlying laws of aerodynamics mean that despite the radical differences in implementation all flying things cluster round a single curve, similarly the realities of data management mean that all these organisations have some underlying dynamics that allow us to compare different sized organisations.

The Data Management function

Within the organisations involved in this study the data management function is carried out by groups with a wide range of positions. In some companies the management of petrotechnical data is carried out within the asset teams, in some it is considered to be part of an "Information Services" department, in some it is a distinct group and in many it is a mix of these.

When interviewing senior staff there was an unsurprising lack of interest in exactly who performed data management. However based on extensive prior experience our suspicion is that the vast majority of data managers qualified in other domains and have little formal training in data

[4] From Kozman, J. and Hawtin, S. "The Main Sequence: Matching Data Management Change to the Organization" (2008) presented at PNEC12 - Houston

management. It was noticeable that none of the senior executives interviewed had a data management background. This is exactly in line with our initial expectations.

This "Cinderella" status of data management is something that has been widely recognised in the industry. CDA and other organisations are working to remedy this by establishing a set of data management competencies which will become a framework for independent certification, career development and recruitment.

The current absence of formal qualifications and lack of executive interest typically combine to ensure that there is no widely agreed definition of exactly what "data management" entails. Does it include publication of interpreted results such as geological models? Does it manage all data delivered to partners? What about application support for E&P software? In most E&P organisations these important topics are almost never discussed.

Cost v Investment

We have argued that spend on data management should be considered in relation to the benefits that it delivers. Any potential additional costs should be weighed against the benefit they will bring and only acted upon if the business case is compelling. However a small but significant number of the participants viewed data management in a slightly different way.

Their picture was that data management was a required activity, somewhat like having electricity in a building, and that the company's interests would be best served by identifying the least expensive way to provide this service. Under this model data management is seen as a commodity, so the organisation should obtain it from the least expensive supplier. Indeed if all the data interactions involved had been documented this might potentially be a viable way to reduce costs.

Of course, any aspects of the role that can be delivered by less expensive resources should be. But since data delivers a significant proportion of an E&P company's value, selecting a suitable third party to be responsible for it should take into account more than a simple question of who is the lowest bidder.

Literature Search

As part of the research for this study a number of specialist oil industry consolidated sources, professional societies and libraries were accessed. These included OnePetro[5], the Lyell Collection[6] and personal collections. The authors have unlimited access to millions of articles from many of the leading societies, journals and publishers relevant to our industry. While a number of interesting and informative items were identified in these sources, very few provided insight into data management issues, in particular, very few discuss the 'value' of data management especially considering how important it is to E&P projects. The most interesting articles have been listed separately in the "Related Literature" document.

One conclusion was that until very recently the data management community has most often published and presented their methods and challenges to themselves. Users and the budget holders have not been involved in the discussion of data management challenges or potential solutions.

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[5] OnePetro.org is a multi-society library that provides access a broad range of technical literature related to the oil and gas exploration and production industry, not least the Society of Petroleum Engineers and World Petroleum Congress. The site indexes more than 85,000 E&P related documents.

6 Launched in 2007 to celebrate 200 years of the Geological Society of London, the Lyell Collection is an online collection comprising of the Society's journal titles, Special Publications and key book series containing more than 18,000 items

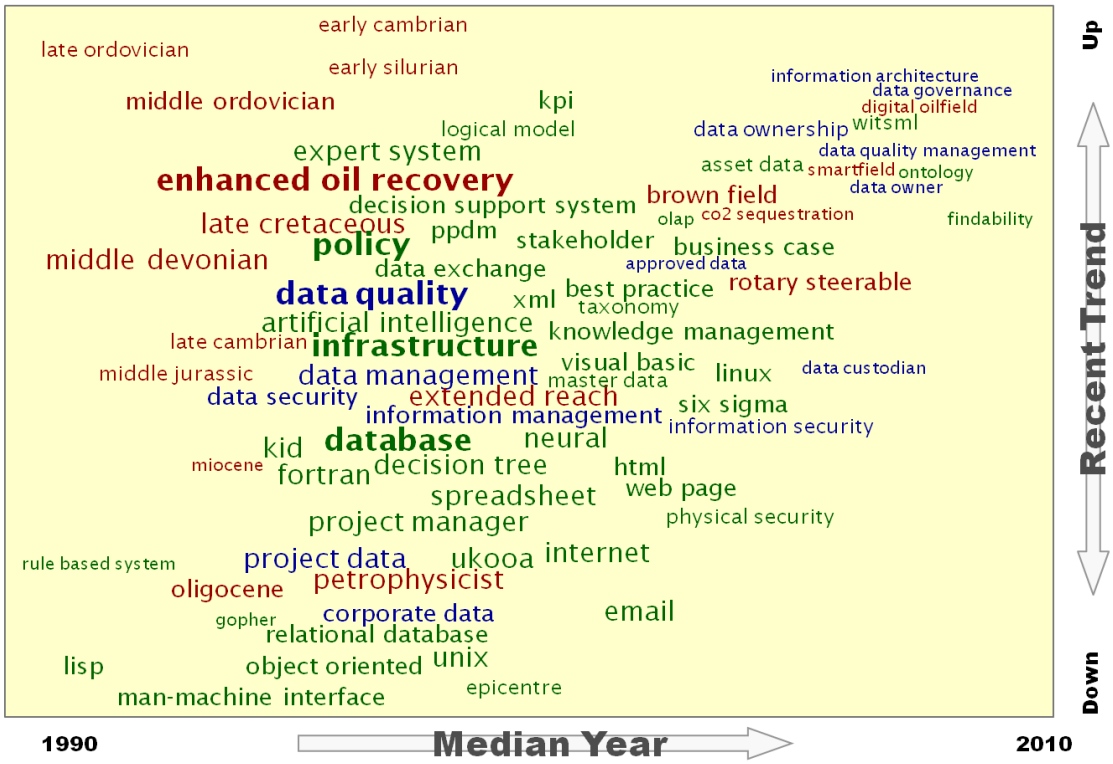

Figure 13: Summary of trends for terms in OnePetro

In addition to using the OnePetro site to identify particular articles of interest it was decided to analyse the terms being used across the whole range of publications they index. In order to do this the number of items returned for each year from 1980-2010 for a range of search term was noted. This data was used to identify the years when terms were most active and how usage of each term has varied over the last few years. A more detailed description of this process can be found in the "Related Literature" document. The results are summarised in the figure above.

The terms listed in the top right hand corner are those which are both recent and growing strongly in usage. Many of these are related to data management. This would appear to show that the importance of data management is receiving growing recognition in the journals and conferences dedicated to E&P business issues.

Value of Data Management

Data brings a significant value, often more value than one might have initially guessed. This value can be increased by effectively managing the data, or conversely, the potential of data can be eroded significantly if it is not available to those who need it when they need or it is of a quality that is unacceptable. However, these two factors together don't necessarily prove that data management improvements are amongst the most attractive investment opportunities in the majority of oil companies, to demonstrate that it is necessary to accurately estimate the costs and benefits and compare those with the alternatives.

What is Data Management?

Before the value of "data management" can be assessed it is crucial that the meaning of the term is agreed. It was clear that most of the senior oil company executives interviewed for this study had a similar view of "data management" and what it entails. They perceived that the main goal of data management is to hold and make available the raw or unprocessed data in a form that can be used by geoscientists. They include categories such as seismic and well log data that are obtained from outside the organisation, and exclude interpreted data such as simulation models and static geological models. In addition while production data has been incorporated in recent years it is still rare for the drilling information to be.

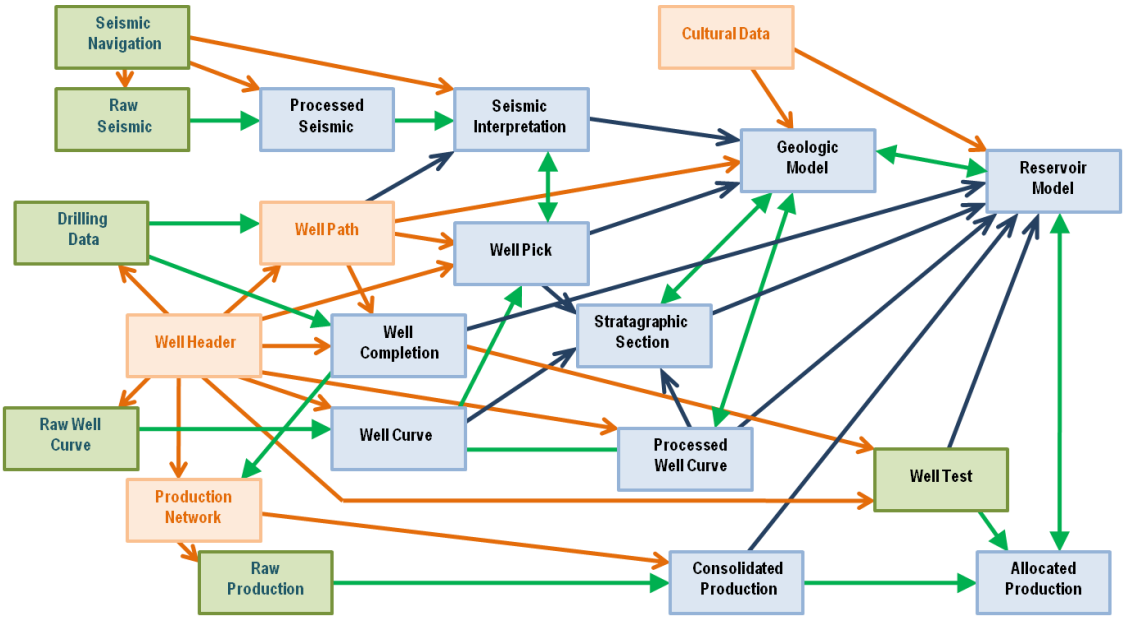

Figure 14: An oil company uses many categories of data

In our experience the best data managers don't usually share this restricted view. They perceive that the goal of data management is to enable all the data flows required to support the business. They believe that keeping track of the interpreted information is at least as important as tracking the initial measurements. After all it is the more refined data items that influence the key business decisions. Tracking the data that is sent to partners and the government is also crucial, since that delivery is tied to corporate legal responsibilities.

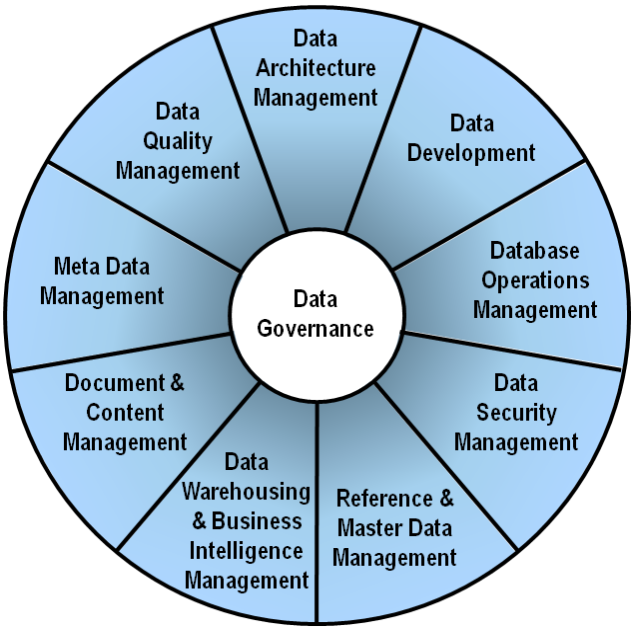

Figure 15: The 10 DAMA Data Management Functions[7]

The most widely accepted description of "Data Management" is probably that provided by DAMA, an international association. In their "Data Management Body of Knowledge" the subject is defined in relation to the 10 functions shown above. Any complete review of data management would need to touch on all ten of the functions, however in this study will focus on the four that have the clearest financial impact on the business:

- Data Governance
- Data Security Management
- Reference & Master Data Management
- Data Quality Management

Data Governance

A consistent approach to handling data is the key to effective data management. As explained in the section above about company size, in a small organisation this can be achieved by allowing an individual to control the processes, however as soon as a larger team is involved it is crucial that important assumptions and principles are documented and shared.

Within the companies surveyed it was uncommon to find any evidence of the systematic definition of data architecture, ownership roles, data strategy discussion or coordination of investments in improving data handling. There was not even any awareness of formal groups tasked with agreeing on these topics.

[7] DAMA (Data Management International) is an independent association of information handling professionals that work in a range of industries. This picture comes from their "Data Management Body of Knowledge" (DMBoK) published in 2009 in ISBN 978-0977140084

Data Security Management

Figure 16: Data Security Management starts by understanding the risks

All data is subject to a wide range of risks. In this case two obvious ones stand out, risk of losing data or of competitors acquiring access to it. There was a case of a company who were bringing on stream a satellite field with two production wells; two days before production start up they could not find the completion drawings for either well. What chance would there be of finding those drawings five years later?

The potential valuable life of different groups of data has already been discussed. However one doesn't need to wait for years for data's valuable life to end, it can be cut unduly short simply because it is misplaced or even if it is not available with what the geoscientist would consider a reasonable effort.

The North Sea has seen an influx of smaller operators acquiring the assets of many of the major oil companies that dominated up until the 1990s. Many of those companies are willing to look back over past data, often buried deep in storage warehouses. There are many examples of companies who are struggling to get the data together they need, but on the other hand are willing to do so as they see that their ability to extract additional value from old data as the key to their continuing success.

Reference & Master Data Management

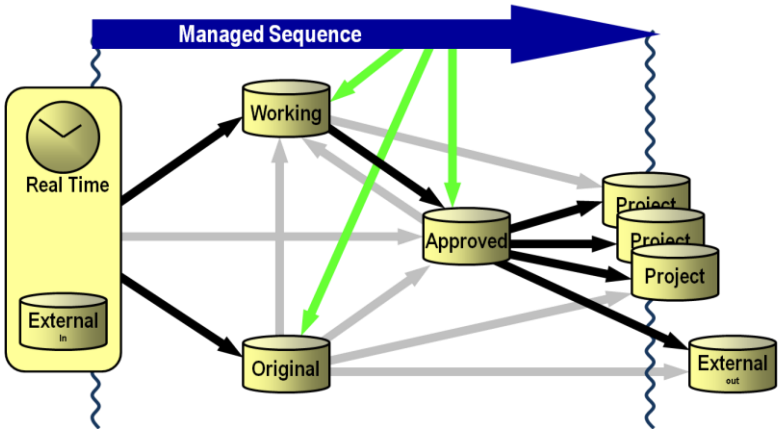

Figure 17: Data plays a number of roles as it is processed

As each category of data is acquired, edited, interpreted and distributed it moves from one repository to another. Each of these locations makes the data accessible to different groups of potential users. One of the most important roles that is played is that of "Master", or "Corporate" or "Approved" data,

this is typically the most long lived and widely accessible version of the data, and should be the highest quality version. As a result, in a well run organisation, it is the most widely used.

Ensuring that the key data categories have a clearly defined, widely used and well managed set of these roles is one of the most important tasks that data management have to carry out. There are no oil companies that reach this high standard for all their categories of data.

Data Quality Management

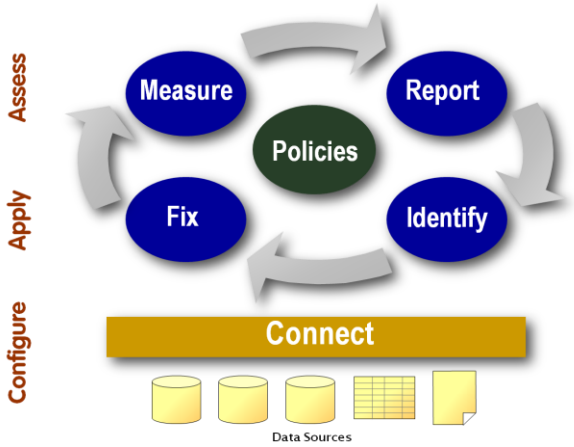

Figure 18: Data Quality Management is a continual process

If the users don't trust the quality of the data they won't use it and it might as well not be kept. As with the Data Security Management the usual key here is the widespread adoption of straightforward processes and procedures.

When data is available from multiple locations and each copy is liable to be "fixed" by different sets of users data quality issues are almost guaranteed to arise. If data quality is not monitored in a systematic way then it is easy to fool yourself into thinking the data is "good enough" when any objective review would show it clearly isn't. The best judges of current data quality are the users, not the data managers.

A variety of tools can be employed to measure data quality, the most effective of these the ones that have been specifically built to support E&P data. These tools are most valuable when they are used to identify where quality problems originate. Finding ways to fix the offending data manipulation processes so that quality is maintained requires input from data managers and the active participation of users.

In a mature basin like the North Sea there are few factors that bring about competitive advantage. The initial data is often shared, the same tools and personnel are available to all. However one differentiating factor is the relative quality of the corporate data, a small improvement in data quality can have a disproportionate effect on overall company performance.

Conclusion

The business benefits available to E&P companies from the management of subsurface of data are rarely quantified and are therefore widely unappreciated. This study shows that effective data management policies and practices have a direct and significant influence on the value that a typical oil company generates each year and that improvements in these areas will surely lead to overall company performance improvements.