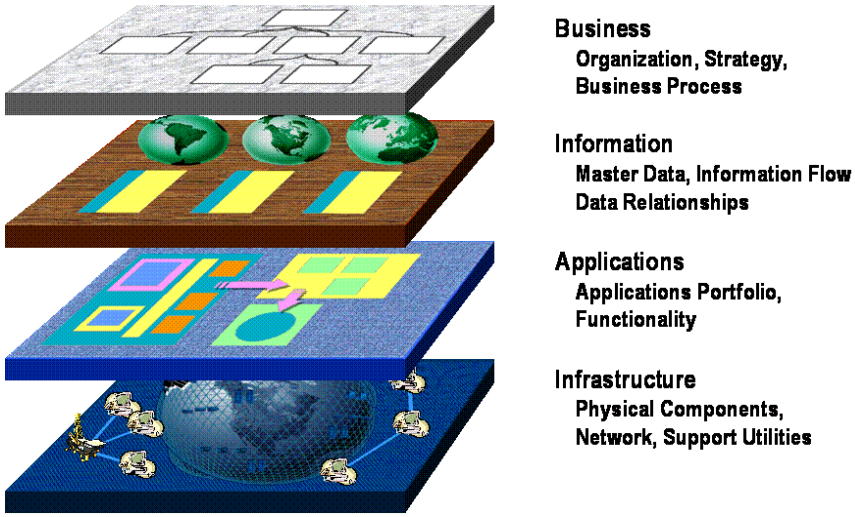
The Main Sequence: Matching Data Management Change to the Organization

Jess Kozman & Steve Hawtin

Oil Exploration & Production (E&P) companies are complex collections of competing interests. Selecting optimal compromises to solve the issues that arise is a complex task. There are many ways to describe the way information systems function in such an organization. One approach that has achieved enough success to make it a cliché is based on the "Business Architecture".



This isolates the concerns of different key contributors into four distinct layers, each of which relies on the services provided by the layer below and supplies the needs of the layers above:

Infrastructure: The servers, hubs and wiring that provide the computing facilities

Applications: The software that is used to manipulate, interpret and summarize the E&P data

Information: The way information flows, how different systems integrate their results

Business: The value creation focused activities being carried out

There are many resources available to illustrate

Documenting the way Information is managed within an organization requires an understanding of:

Streams: how data is organised

Workflows: what needs doing when and by whom

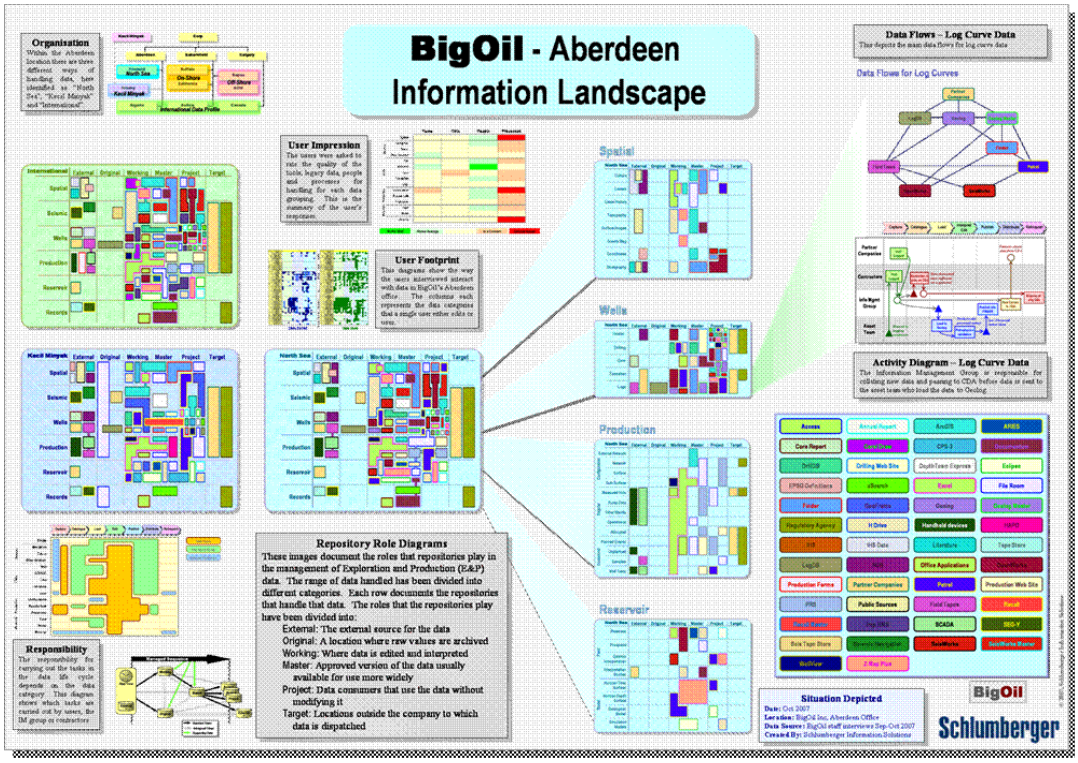
Data flow: how information moves

Roles: which categories of information are held where

Exceptions: how IM varies within the organisation

Organisation: relationships between groups

These elements together form the "Information Management Landscape" which has been more fully described elsewhere[1].



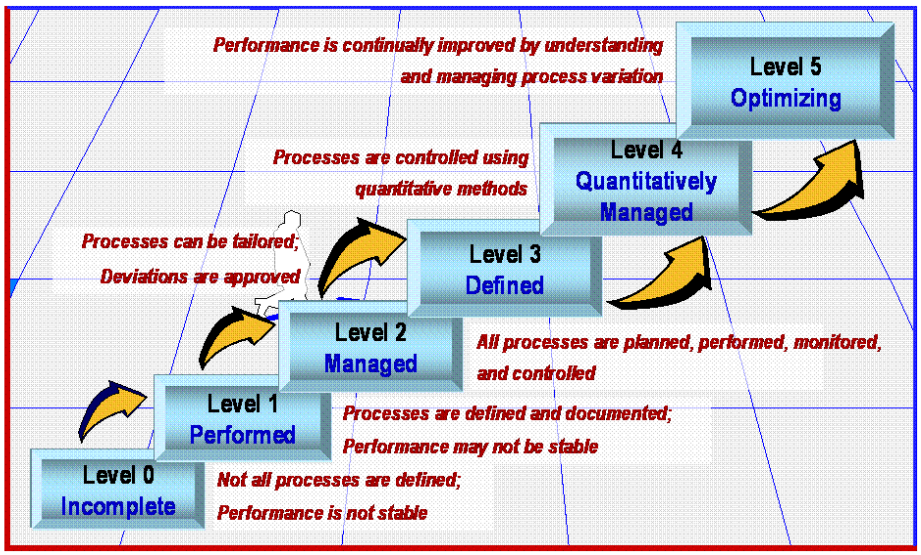
A complete description of an "IM Landscape" employs a wide variety of artifacts[2] each of which provides insight into some aspect of the overall situation. This detailed exploration of the current and potential way that Information Management works is invaluable for IM practitioners.

---

[1] See for example "Experience from IM Assessments" from PNEC10 or the whitepaper "Adding Value with IM Assessments: E&P Data Management Today" available at *Insert Link when someone puts this on web site*.

[2] See for example "Sharing a common view of the Information Landscape" from ECIM2007

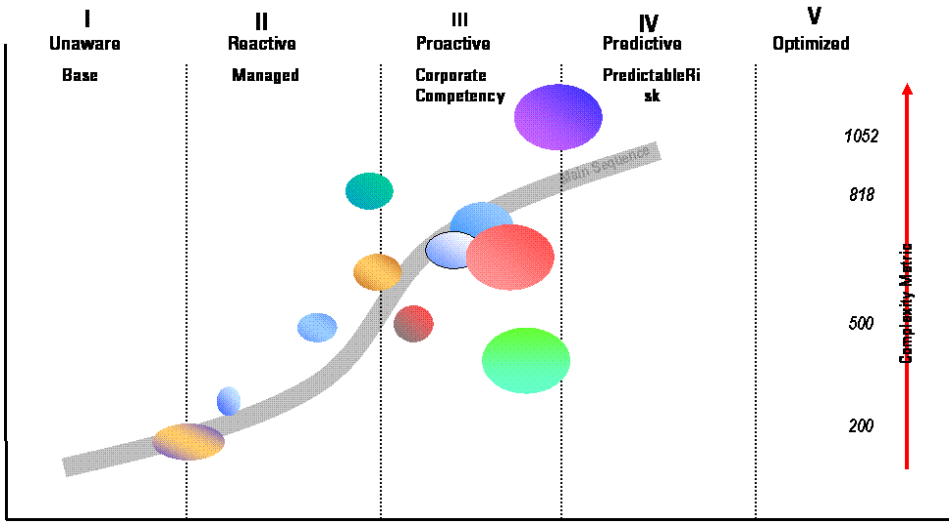
However it is also important to provide simpler metrics, both to convey some of the overall trends to non-specialists such as management and to assist in identifying headline strategies for improvement. Over the years Schlumberger has used a number of metrics to summarize aspects of the complex picture. The less diagnostic measurements have been rejected and the more successful ones have been refined.



The Data Management Maturity metric[3] is the prime example of a measurement that has proved to be a stable and valuable simple measurements of a company's Information Management. It was originally based on a methodology from the Software Engineering Institute (SEI) that has been tuned to meet the needs of the E&P industry. Years of experience in using this metric have resulted in a large amount of material that recommends positive actions tailored to improve a client's current situation. However, this is just a single numerical description, even if it is a critical one.

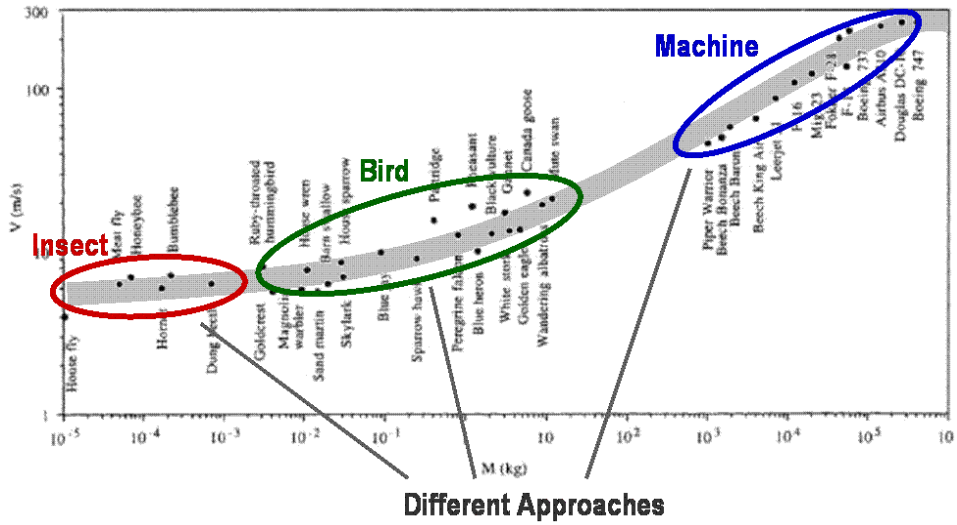
One key aspect of a corporate profile that the maturity measure does not address is the "complexity" of the client's IM Landscape. This is a partially a reflection of the number of crucial data categories that are managed and the company's data management policies, however the largest contributor to this is the number of different ways that the same data is handled, for example in different asset teams and locations. For the last few years estimates of complexity have been made by using specialised internal Schlumberger tools.

[3] The DMMM has been described in many previous papers for example "Maturity Models for E&P Information Management" ADIPEC 2004 (SPE 88666)



When the maturity and complexity measure for various E&P companies are combined the result is as shown above. In this diagram above each oval represents a single E&P company. The size of the oval provides an indication of the size of the organization.

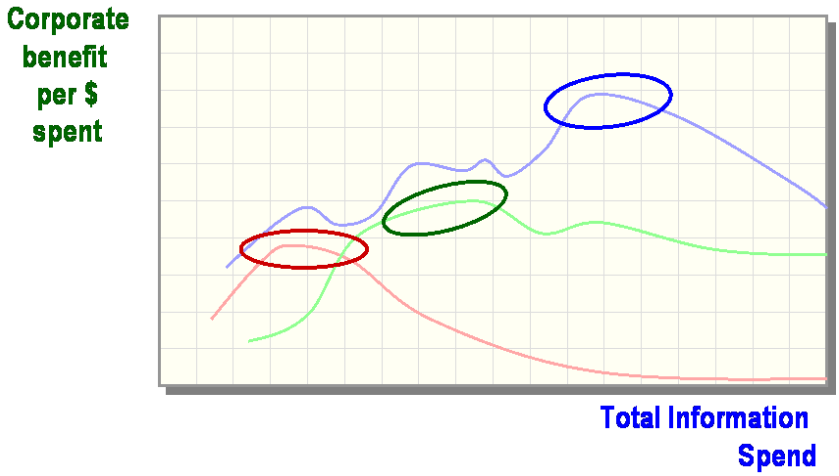
There are a number of observations to be made about this depiction. The first is that most companies lie along a "Standard Sequence" that tracks the increase in complexity that can be supported by more mature organizations. The second observation is that the larger E&P companies tend to have higher maturity levels, this appears to arise from the fact that investment in data management awareness can be shared across the company, so a proportionately lower investment can be more widely effective in a larger organization. Of course the other side of this is that larger companies need to more mature data management environments in order to function.



This type of generic review has obvious similarities with the type of allometric studies that are performed in Biology. For those unfamiliar with this approach here is a graph[4] of

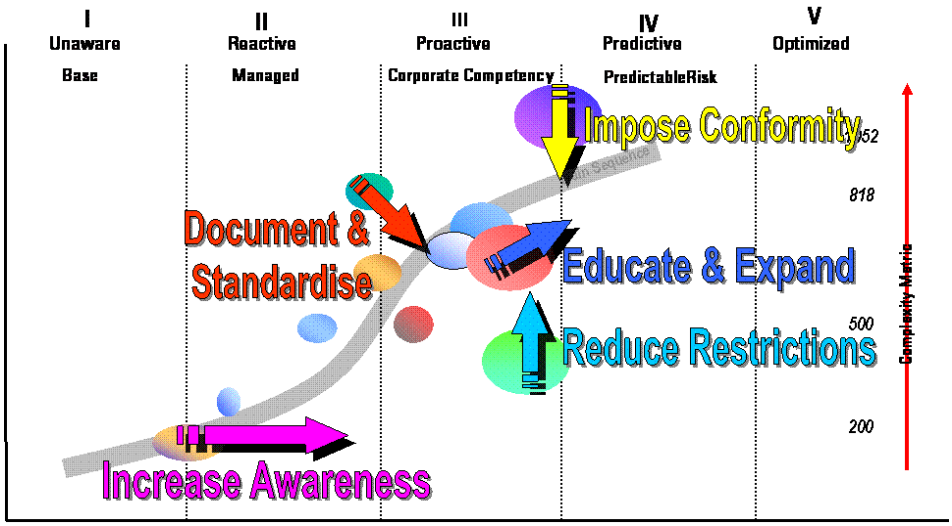
[4] The image here is from the Wikipedia article on "Allometry"

the optimum flight speed against mass for a variety of insects, birds and airplanes. It shows a remarkable underlying consistency between the performance of radically different things that fly.



The similarity is more than just a coincidence. In both cases it comes from very similar underlying mechanisms, each point represents a single current solution to optimizing a situation. In the one case reducing the energy required to remain airborne in the other case maximizing the return for a dollar invested in Information Management.

Different types of companies have distinct benefit curves in response to changes in budgeted IM spend. As with the flight example different types of company can be found at different locations within the space.



And this is the main benefit from performing this analysis. From our experience the location within this space indicates a "theme" that suggests the strategic direction of the next step that a company should undertake. In the cases above a suggested strategy has been added for five of the companies.

Of course any “high level” strategy must be translated into a programme of projects each of which can be justified on its own merits. Creating an individual cost/ benefit case for each project still requires an appreciation of the detailed issues that affect business effectiveness. However these themes help to focus attention on the projects that are most likely to help optimize the complete picture.