

ECIM



ECIM & CDA

Joint Data Management Workshop

Aberdeen

10th February 2016

Improving Industry Efficiency: Real Opportunities from Data & Analytics

Proceedings

Contents

1	Workshop Overview	1
2	Keynote: Can Data Science help Maximise Economic Recovery?	3
3	Presentation: Big Data – from Niche Use Case to Standard Operating Procedure	4
4	Presentation: How Analytics can be implemented quickly to respond to Real World Needs	5
5	Presentation: Big Data is also good for Data Managers	7
6	Presentation: Applying Data Analytics to Rock Physics, Rock Properties, and Rock Mechanics..	8
7	Presentation: Now that you all Understand Analytics and Big Data – what’s next?.....	10
8	Working Session: Deploying Data and Analytics: Reality in the UKCS?.....	11
	Appendix A: Workshop Attendees	13
	Appendix B: Speaker Biographies.....	15

1 Workshop Overview

1.1 Background

ECIM and CDA have agreed to work together in Europe to help and encourage Data Management professionals to enhance their professional and technical competence, primarily through development, community building, and establishing a Body of Knowledge for the discipline.

As part of this work, both organisations have undertaken to organise a series of workshops on themes of immediate relevance to industry data managers based in Europe.

These are the proceedings of the second such workshop, held in Aberdeen on 10th February 2016, on the subject of data and analytics.

1.2 Workshop Purpose

Many oil and gas companies have invested in data management and analytics, and some are now reaping the benefits through improved exploration, drilling, and operational effectiveness.

This workshop brought together UKCS participants and technology providers to share recent successes, lessons learned, and forthcoming developments in the application of data and analytics to improve decision making, increase cost efficiency, and identify innovative business opportunities across the oil and gas value chain.

1.3 Workshop Programme

Start	End	
12:50	13:00	Welcome and Introduction – Malcolm Fleming, Chief Executive, CDA
13:00	13:30	Keynote: Can Data Science Help Maximise Economic Recovery? Steve Harrison, Project Manager for Digital Oilfield, Scottish Enterprise
Sharing the start of a bold vision and seeking your willingness to make it a reality. Can we prevent the Preventable? ...predict the Predictable? ...find the missing Platform?		
13:30	13:55	Big Data – from niche use case to standard operating procedure David Holmes, Chief Industry Executive, Oil and Gas, EMC
In this presentation, EMC will review the results of its own applied research in the application of contemporary big data and analytics techniques to upstream business problems, and will then consider how oil and gas companies are starting to build broad ecosystems to support big data and analytics rather than implementing ‘one-off’ point solutions.		
13:55	14:20	How Analytics can be implemented quickly to respond to real world needs Mark Claxton, Energy Sector Director, Tessella Limited
Using lessons learned in other industries to help the Oil and Gas community get best value from analytics and big data.		
14:20	14:30	Question and Answer – Led by Daniel Brown, CDA
14:30	14:55	Refreshments and Networking
14:55	15:20	Big Data is also good for Data Managers Henri Blondelle, Business Development Manager, Data Management Services, CGG
How machine learning can improve Data Quality Management Tools.		

Start	End	
15:20	15:45	Applying Data Analytics to rock physics, rock properties, and rock mechanics Alan Pointing, Global Data and Information Management Delivery Manager, Maersk Oil
Some of the challenges about storing, mining, and analysing specialised sub-surface data types, such as rock properties are explored.		
15:45	16:10	Refreshments and Networking
16:10	16:35	Now that you all understand analytics and big data – what’s next? Niall O’Doherty, Director Business Development, Manufacturing and Energy, Teradata
The time for playing with big data and analytics is over. Now companies need to deliver real insight and value.		
16:35	17:05	Working Session: Deploying Data and Analytics: Reality in the UKCS? Steve Harrison, Project Manager for Digital Oilfield, Scottish Enterprise
Data and analytics techniques can only deliver value if deployed. Steve will lead an interactive working session exploring the real-world challenges delegates face in deploying new technology at a \$30 oil price, and consider potential solutions, including opportunities for financial and technical assistance through government-funded initiatives.		
17:05	17:15	Question & Answer – Panel Session Led by Daniel Brown
17:15	17:30	Conclusions & Next Steps – Led by Malcolm Fleming

1.4 Workshop Presentations

The presentations given by most of the speakers are available for download by registered workshop attendees only, at the ECIM Workshop website:

www.ecim.no/download100216

Photographs taken during the workshop are available on Flickr:

<https://www.flickr.com/photos/134730938@N07/albums/72157665184416126>

1.5 Guest Speakers

CDA and ECIM were pleased to welcome the following guest speakers to the Workshop:

- Steve Harrison, Project Manager for Digital Oilfield, Scottish Enterprise
- David Holmes, Chief Industry Executive, Oil and Gas, EMC
- Mark Claxton, Energy Sector Director, Tessella Limited
- Henri Blondelle, Business Development Manager, CGG Data Management Services
- Alan Pointing, Global Data and Information Management Delivery Manager, Maersk Oil
- Niall O’Doherty, Director Business Development, Manufacturing and Energy, Teradata

Full speaker biographies may be found in Appendix B: Speaker Biographies.

2 Keynote: Can Data Science help Maximise Economic Recovery?

2.1 Aim

Data Science is an area in which Oil and Gas is perceived to have lagged behind other industries. There remains considerable scope for data science to positively impact the oil and gas industry, especially in the current climate.

This presentation outlined Scottish Enterprise's thinking on the opportunities in Data Science in the UK Oil and Gas industry and highlighted the support Scottish Enterprise could provide in collaboration with UKCS operators and the supply chain.

2.2 Presentation Overview

Steve Harrison from Scottish Enterprise began the workshop with a brief, informal survey of delegates, to determine who in the room was involved with acquiring, selling, analysing, creating, or otherwise facilitating work with data. This was followed by questions on the current view of the industry: will the oil price rise to over \$100? Will a dry well ever be drilled again by 2020? Are there still more hydrocarbons to be found?

Steve explained that Scottish Enterprise acts as a facilitator, working business areas ranging from aerospace to life sciences to help companies to be more innovative. Within the domain of oil and gas data science, the strategic objectives of Scottish Enterprise are:

1. To improve the viability of UKCS operations;
2. To improve viability of Scottish Oil and Gas companies; and
3. To increase sales of Scottish developed digital/data oil and gas products and services.

Scottish Enterprise's ambitions include providing support to companies to develop, build and prove investment in data science, so as to increase and sustain exploration and production, and improve industry reliability and efficiency through data science.

Several blockers were explored, such as the perceived cost of implementing data science solutions, low exploration activity and production efficiency and unproven "golden bullet" solutions being offered.

The second half of Steve's presentation focused on gaining the perspectives of companies in the room to inform and validate the business case for Scottish Enterprise's investment in this area; and, secondly, on the challenges of how to identify the main sources of value for data science in the oil and gas industry; and then how to get after that value quickly?

The first challenge prompted several questions; can data technology help to recover hydrocarbons? Or in other words can it predict the predictable? Can data technology inform investment decisions? Steve presented several ideas where value could be realised in different areas of the industry which formed a good basis for discussion later in the day.

The second challenge was supported by several case studies including the rise of AirBnB and their innovative business model. Steve explained that Scottish Enterprise is there to support companies to innovate and grow as well as nurture new companies to flourish.

The presentation concluded with more questions to stimulate the audience:

- Do you have a dataset that you think may have hidden value?
- Do you have a potential solution to a problem but need help building the business case to secure the investment needed?
- Do you have a data science use case that needs to be tested and evaluated?

Scottish Enterprise can provide funding and support for these kinds of developments.

3 Presentation: Big Data – from Niche Use Case to Standard Operating Procedure

3.1 Aim

In this presentation David Holmes shared EMC's approach to meeting the demands placed upon industry by current market forces: applying holistic solutions that meet multiple needs, rather than propagating multiple solutions across many niche platforms.

3.2 Presentation Overview

David began by outlining the interrelated demands placed upon industry by current market forces:

- Cost reduction
- User experience improvement
- Data centre optimisation.

He then provided an introduction to EMC and their growing research and development in Data Science within the oil and gas sphere. Ongoing projects include seismic data pattern matching, which can screen large datasets quickly to identify target areas for further investigation, as well as drilling data analytics for predictive maintenance, product optimisation, and logistics optimisation.

Using the example of predictive maintenance, which has been referred to as the 'poster child' for big data and analytics, we now have a multitude of products and solutions to deal with each type of equipment and potential failure. Many organisations have adopted various combinations of predictive tools, software, and hardware, however very few have taken the approach of applying solutions holistically across a single integrated platform.

David explained that EMC has developed methods to integrate some of these products and platforms, enabling organisations to leverage their infrastructure efficiently, thereby meeting all three of the industry demands described above. David also discussed the pace at which platforms evolve, along with the rate at which volumes of information and data are growing, bringing about the challenge for new generation platforms to be able to support older platforms.

3.3 Conclusions and Q&A

David concluded that new ways of analysing data are necessary but it's also important to consider new approaches in light of existing tools and infrastructure – to recognise the 'bi-modal' nature of deployed IT. Much can be done internally to work towards structures that bring together all of an organisation's infrastructure vintages, for optimised analytics and increased efficiency.

One of the questions raised by participants was on how to bring about internal or industry-wide change in this context. David shared EMC's experience in Brazil, where there is a culture of using regulations to drive innovation, and suggested there is an opportunity for the OGA in the UK to do the same. The question of data provenance, when dealing with large volumes of data, was also raised. David responded that while most of us are familiar with quantitative measures of quality and provenance, there is room for qualitative approaches within emerging technology, for example crowdsourcing and 'Amazon ratings' by data users to identify data quality issues.

4 Presentation: How Analytics can be implemented quickly to respond to Real World Needs

4.1 Aim

In this talk, Mark Claxton of Tessella Limited, encouraged the audience to think more openly about, and take advantage of, analytics techniques that have been used successfully in other industries – and thereby open up possibilities for using these techniques in the oil and gas industry. Analytics can be implemented quickly to respond to real world problems and challenges, and can be used to answer complex questions.

4.2 Presentation Overview

Mark began with examples of analytical techniques used successfully in other sectors, and how (and often, surprisingly) these may be applied in the oil and gas industry.

Oil and gas is learning to handle rapidly increasing amounts of data, but other sectors have already developed tools and techniques to achieve this (not least, in academic areas such as genome research and particle physics). As a result, answers to oil and gas problems may be found in unexpected places. It is possible, after applying a few twists and some lateral thinking, to link unsolved problems in one domain with solved problems in another.

4.2.1 Image analysis, and drill bit replacement

One example of this approach from the Tessella archives is the evaluation of drill bit damage through a combination of technology and algorithmic image analysis instead of purely human interpretations of drill bit conditions. By applying Bayesian-based analytics with Kalman filters to video footage, drill bit wear and tear can be more accurately assessed, leading to optimal decision making for bit replacement.

4.2.2 Vibration analysis, and maintenance interventions

Vibration analysis developed in the automotive and nuclear waste industries for remote sensing in highly hazardous and hostile environments can be used to 'listen to' vibrations in offshore plant to enable maintenance at the point of necessity, avoiding premature replacement in some cases.

Assessing individual assets using a variety of measurement-based techniques is another successful technique. This looks at individual assets (pumps, compressors, generators etc.) not as generic stereotypes but individual, unique pieces of equipment, as no two pieces of kit have the same maintenance historic, spare part replacements, or operating history. Positive feedback using asset-based measurements determines the most effective way of improving performance and reliability for that piece of kit.

4.2.3 Radar track analysis, and prospect identification in seismic and well studies

The defence industry has developed techniques for radar target tracking using Bayes filters to predict and confirm new track initiation and remove the 'noise' that may obscure it. Whilst this has proven application in spotting enemy aircraft it has also been successfully applied to entirely unrelated areas, such as in providing quantitative evidence of regrowth of hair after hair removal product use.

These same techniques for filtering out noise can be used in inverting seismic data. When using large datasets such as seismic data, it is necessary to reduce the amount of data for speed of processing but not at the expense of accuracy. These techniques can help achieve this.

In the wells area, Bayes filters may be applied to noisy LWD and MWD data, enabling features of interest to be more easily distinguished from background rig telemetry data.

4.2.4 Data Driven Analytics and the Human Factor

Data driven analytics can be used to improve the performance of machine operators, as well as that of the machines themselves.

In the train industry, measurements specific to each train are used to predict maintenance and reduce operating delays. When applied also to the drivers, safety and efficiency may be improved empirically (rather than anecdotally), through highly focussed and targeted training. With safety as the prime factor there are obvious applications in the oil and gas sector to remove the 'dark art' of subjectivity and measure objectively using data.

4.3 Conclusions and Q&A

One blocker to overcome is the culture of 'not sharing' even within a single organisation. Oil and gas companies must open up their data silos across organisational divisions to enable analytical links to be made. Collaboration starts at home.

5 Presentation: Big Data is also good for Data Managers

5.1 Aim

'Big data' techniques can be applied most easily to data already maintained in a structured repository, but much oil and gas data exists as PDFs, and in other unstructured document formats.

In this presentation, Henri Blondelle of CGG Data Management Services described how machine learning techniques can be applied to this problem, enabling well data repositories to be enriched using data extracted automatically from well documents.

5.2 Presentation Overview

Henri began his presentation by highlighting the risk of relying on data provided by well logging tools, without also reading the narrative documents that accompany the logs. For example, a depth interval identified in the logs as a prospective pay zone turned out to be merely an artefact caused by issues in log data collection.

As access to well documentation can be more difficult, and more time consuming than simple review of well log data, an opportunity exists for tools that can extract data from the documentation, and then use this to enrich the view of well data presented to geoscientists – current estimates suggest up to 85% of available unstructured information is not used in decision making processes.

Henri provided an overview of iQC, a tool developed by CGG Data Management Services to automate the reliable extraction of metadata from well documents using machine learning techniques, potentially providing large savings over pre-existing manual approaches.

iQC uses a supervised machine learning algorithm, which begins when an initial training set of representative documentation is processed, metadata of interest extracted, and issues in the quality of the extraction identified and fed back to the tool. This feedback improves the accuracy of the next pass, and the training process is repeated until quality is at an acceptable level (in this case, at least as good as the previous, human-based approach). The tool is then exposed to increasingly larger bodies of documentation, ultimately enabling rapid data extraction from numbers of documents that would be uneconomic for manual processing, which supported further training and refinement of the machine learning algorithm.

CGG has used this tool internally for enrichment, and data quality improvement within its Robertson Research data collection, and has also worked in partnership with a number of third parties to demonstrate the feasibility of the tool within the market place. The outcome is a tool tailored to the needs of oil and gas that can scale to enable use to be made of all the unstructured data associated with the 20-30 million wells CGG estimates have been drilled to date.

5.3 Conclusions and Q&A

Henri concluded his presentation by discussing the next steps CGG will take to commercialise iQC, and invited the audience to provide data and business challenges that would be suitable for investigation using this approach.

Questions included if the tool would need substantial re-training to handle non-English languages. Henri indicated that this was not the case, as demonstrated by a project run in collaboration with a Russian oil company: iQC is able to accommodate multiple languages within the same machine learning model.

6 Presentation: Applying Data Analytics to Rock Physics, Rock Properties, and Rock Mechanics

6.1 Aim

Alan Pointing of Maersk Oil discussed rock properties, a specialised data type within subsurface data, and whether Big Data and Analytics can be used to help handle and analyse this data type better, in order to gain further insight into the subsurface.

6.2 Presentation Overview

Alan introduced the domain, giving an overview of rock properties, including rock mechanics, rock physics, and fluids. There are a variety of analytical techniques performed upon the rock properties of samples, which are then used to determine factors such as reservoir characterisation, fluid flow, wellbore stability, pore pressure prediction, and enhanced oil recovery. Alan then described a basic flow of information, beginning in sample form at wellsite, to sample store, to analysis lab, where reports and associated datasets are then produced and passed on to the technical users and data management teams. In Copenhagen Maersk has a highly automated core store, as well as their own lab facilities for carrying out basic core analysis.

Alan described a project that Maersk undertook to load core analysis data into a bespoke database. The 'traditional' approach to data loading which was taken here can be quite an effort, and this project involving 189 wells took two years. The data could then be visualised and presented in a suitable way to petrophysicists. This underlines the real importance of getting digital data into appropriate databases from the point of acquisition, to then be manipulated and analysed as required without further loading effort.

Maersk also makes use of commercial and other externally sourced datasets, however each often comes with their own data model and interface. Ideally these would be fully integrated with the in-house datasets; the current method of doing so is via GIS, which is only a partial solution.

Alan shared his observation of Maersk's data challenges, from a data management perspective:

- Variety of sources: in-house, 3rd party, commercial
- Lack of a standard data model
- Lack of integration
- Changes in experimental methods over time
- Data quality issues in extracting data from old reports

He then moved on to discussing how Big Data methods can help to address these challenges in the rock properties domain. When considering the main criteria for Big Data (Volume, Velocity, Variety, Variability, Complexity) rock properties fulfils two of these criteria:

- Variety, as it is produced in different formats, e.g. numeric data, documents, media.
- Complexity, as it comes from multiple sources.

There are, therefore, opportunities for Big Data techniques to offer more complex and intelligent analysis of this data type. These include utilising more flexible repositories which are able to cope with new and diverse data sources, tools that can import multiple formats of data, being able to map data on the fly, and offering more user driven analytical tools.

6.3 Conclusions and Q&A

Alan concluded that there are significant opportunities for applying data analytics to the domain of rock properties, which will enable techniques such as forward modelling and the application of analogues, and more complex queries to be carried out. He also cited the Joint Chalk Research Library (JCRL), a collaborative initiative that Maersk is involved in, which employs analytical techniques in the extraction of hydrocarbons from chalk reservoirs.

Questions included the cost of developing the internal database of core analysis data. Alan believes the cost itself was relatively low, but it required a large amount of time. There were also questions around whether there are standards being developed for the exchange of rock property data, to which Alan responded there were limited standards within the PPDM Seabed model, however the JCRL is also looking into standards; he agreed that it would be helpful for the OGA to develop industry-wide standards as part of regulations.

7 Presentation: Now that you all Understand Analytics and Big Data – what's next?

7.1 Aim

Niall O'Doherty of Teradata presented a call to action to stop using 'Big Data' as a management buzzword, and to start using analytics as a useful tool.

7.2 Presentation Overview

Niall began by saying that 2015 was the year of Big Data.

There were many conferences on the topic aimed at oil and gas company executives and practitioners. 2015 was the year that 'Big Data' disappeared from the Gartner hype cycle – as it had matured sufficiently in many industries to no longer be hype. However the oil and gas industry is somewhat behind the curve in terms of implementation compared to other industries.

The latest buzz is around the "Internet of Things" – which will connect all your equipment, smart meters, production gauges and databases together to allow analytics to predict when a piece of equipment will fail (among other things).

However there are a number of misconceptions about what Big Data is and what can be achieved:

- Big Data is not new. Data volumes have increased gradually but analysis of data has always gone on, it just wasn't called big data analytics. A good example is retail loyalty card analytics which is another way of saying market research.
- Big Data is not all about Big. Analytics can be equally revealing based on small datasets. The trick is to measure the right things.
- Big Data does not equal Hadoop. There are any number of techniques and tools to do this. What is required is imagination.
- Big Data does not give you all the answers. Probably just more questions.
- Big data is equally valid for traditional companies as it is for new innovators. Traditional companies need to become innovators too.

There is a great attraction for new tools that 'just work' meaning that you don't have to configure them very much or worry about the condition and validity of the input data. However real value will be gained from Big Data when the data is managed properly. The data managers need to be involved.

Niall then moved on to what we do next and proposed that we need to be able to analyse all of our data all of the time: data that is 'dark' – that cannot be accessed by analytics tools – has no current value, and could be considered for disposal. 85% of questions asked by business analysts are new questions that have never been answered before – and access to all the data is required to find good answers to these questions. This will only be possible if the data is well managed.

When we think about how to build applications for the 'Big Data' world, we should look to build Apps, not Applications. Apps are small, do one task well, and can be delivered quickly, and so quickly deliver value. This is the opposite of the 'traditional' IT approach. This means being agile: to build a tool to do a job quickly and then move on, rather than building something that takes several years in procurement and is obsolete before you use it.

The next step: talk to professionals who have done this before.

8 Working Session: Deploying Data and Analytics: Reality in the UKCS?

8.1 Aim

Data and analytics techniques can only deliver value if deployed. This working session, led by Steve Harrison of Scottish Enterprise, investigated the real-world challenges faced by delegates in deploying new technology at a \$30 oil price.

8.2 Session Overview

The working session began with an individual, form-based exercise, in which delegates identified the most significant opportunity, in their view, for data science and analytics in their industry. Next, delegates considered the barriers to realising that opportunity, at industry, and company level. Finally, each delegate identified the help and support they needed to overcome the barriers presented.

The second stage of the session involved discussion at tables of the opportunities and challenges each delegate identified, with the aim of selecting a single set of opportunities and challenges to be summarised, and then presented back to the whole workshop as the final stage of the working session.

Forms and table summaries were collected by CDA and ECIM for analysis after the workshop completed.

8.3 Conclusions

Each table summarised the opportunities and challenges faced in this area as follows:

Table Stories: Opportunities, Challenges, and Help Needed

We should generate clearer visibility of the data companies already have: to bring light to dark data, leading to reduced risk, fewer missed pay zones, and ultimately, lower lifting costs

The challenge is to eliminate waste in E&P business processes by making better use of the data companies already have. This could be achieved through application of existing techniques to both structured and unstructured data, but requires substantial education at executive level to achieve: big data is not a 'big red button'.

Integrating data solutions should support better interrogation of failure and near failure causes, supporting operational efficiency, safety, and loss management, as well as supporting reducing future P&A costs, and improving efficiency in oil field logistics. This is a challenge as data is currently siloed in different formats, and due to industry behaviours and lack of a published business case, companies are reluctant to proceed. The challenge may be addressed through better communication (one strong industry voice), through re-use rather than re-invention, reduction in the number of formats used, and investment in extraction tools that support the wide variety of industry formats used.

Current industry cost cutting may renew interest in data management as a source of efficiency. This may be supported by OGA / governmental guidance, particularly through the adoption of the same standards across multiple countries, including for historic, as well as future data sets.

Table Stories: Opportunities, Challenges, and Help Needed

Creation of a global exploration database would support retention of knowledge, increased development efficiency, and free flow of collaboration across the industry. This should yield more effective investment strategies, assist in lower lifting costs, and improve the performance of compressors, and oil field logistics.

The current challenge is in knowing what data we actually have, extracting that information, and using it to define business challenges. This is hindered by a lack of recognition of the value of investment in data, lack of industry collaboration, and the adoption of disparate standards.

Industry is challenged by having data in separate systems – siloed across protected empires that have individually invested in their creation, and hence may not buy in to the problem statement. Industry can help by articulating the real value of sharing, and encouraging the appointment of ‘Chief Data Officers’ at board level.

Feedback from the individual, form-based exercise identified opportunities in the following themes:

- Extraction of value from legacy and unstructured datasets;
- Integration of disparate datasets to yield new insights; and
- Automation of data-centric tasks to yield more staff time for analysis and insight.

The challenges faced by industry can be grouped as follows:

- Cost, the low oil price, and the resulting reduced access to investment capital;
- Lack of understanding at senior management level of the value of current data tools, technology, and data management techniques; and
- The highly siloed data and business landscape that must be bridged by data integration opportunities.

These challenges manifest at the company level in the following themes:

- Difficulty in acquiring budget for data work;
- Lack of senior management understanding and sponsorship for data work;
- Initiatives run locally may fall foul of policies and standards set at global / multinational level; and
- Lack of a clear cut example / business case where data management has delivered real value.

To address these, help was requested in these areas:

- Increasing the level of cross-industry collaboration and sharing of information, tools, and techniques;
- Promotion and communication regarding the value of data from the OGA, at Chief Executive level;
- Improved definition and adoption of standards for data sharing;
- Creation of convincing case studies relating to the value of modern data practices; and
- Faster release of data by the OGA.

The issues raised will be taken forward by CDA and ECIM in their work plans for 2016 and beyond.

Appendix A: Workshop Attendees

Organisation	Delegate Name
BP	Mel Craig
BP	Isobel Emslie
CDA	Terry Alexander
CDA	Daniel Brown
CDA	Malcolm Fleming
CDA	Richard Salway
CDA	Sakthi Sithamparanathan
Cegal	Robin Parkinson
Centrica	Hazel Cowan
Centrica	David Sneddon
CGG	Henri Blondelle
CGG Data Management	Christine Butler
Chevron North Sea Ltd	Will Jones
Chevron North Sea Ltd	Katy Stewart
ConocoPhillips	Paul Norwood
ConocoPhillips	Marcia Ritthammer
DataCo Ltd	Daniel Clarke
DataCo Ltd	Daniel Hodgson
DataCo Ltd	Tracy Beglin
The Data Lab	Cecilia Bouroncle
Decomm Data Ltd	Jane Hodson
DeTech Consultancy Limited	David Ewen
DNV GL	Brian Bain
E&P Consulting	Ian Kennedy
ECIM	Reidar Kalvig
EMC	Andy Stewart
EMC	David Holmes
GeoDirk Scotland Ltd	Ken Armitage
GeoDirk Scotland Ltd	Jack Blanton
GeoPetra	Nick Gibson
Halliburton	John Allen
Halliburton	David Seymour
Halliburton - Landmark	Mark Sambrook
Intelligent Plant Ltd	Steve Aitken
Intelligent Plant Ltd	Bruce Nicolson
Interica Ltd	Jamie Hisee
ITF Energy	Patrick O'Brien
Llahven Ltd	Neville Hall
Lockheed Martin	Jennifer Morrison
LR-Senergy	Linda Stromberg
Maersk Oil	Jonathan Fleetham
Maersk Oil	Christine McKay

Improving Industry Efficiency: Real Opportunities from Data & Analytics

Organisation	Delegate Name
Maersk Oil	Alan Pointing
Met Office	Laura Seenan
NDB Ltd	Jodie Dunbar
NDB Ltd	Adam Watt
Oil & Gas UK	Andrew Leonard
Schlumberger	Lewis Low
Scotland IS	Allan Sutherland
Scottish Enterprise	Graham Fairlie
Scottish Enterprise	Steve Harrison
Shell	Sarah Cormack
Shell	Zak Crawford
Shell	Jo Matheson
Shell	Andrew McNeil
Shell	George Rorie
Teradata	Niall O'Doherty
Tessella	Mark Claxton
ThinkTank Maths Limited	Angela Mathis
ThinkTank Maths Limited	Cyrille Mathis
Troika	Audrey Hughes
Troika	Jill Lewis
University of Aberdeen	Marcus Campbell Bannerman
University of Aberdeen	Andrew Starkey
Venture Information Management	Alex Kinash

Appendix B: Speaker Biographies

<p>Steve Harrison Project Manager for Digital Oilfield, Scottish Enterprise</p>
<p>Steve spent 17 years working in the private sector for a global engineering company where he had the opportunity to dabble with cars, planes, space, vodka & oil. He rose from a project engineer in Chennai to the Strategy Development Manager for Europe, Middle East, Africa and Asia for an Oil & Gas Services company.</p> <p>On gaining Board approval to build a £Bn division with a £Bn budget for acquisitions, Steve shortly left the corporate world due to ill health. Steve found a new role as a high tech account manager at Scottish Enterprise (the economic development agency for Scotland). From here once again Steve has followed a diverse path helping in various sectors from Bio-tech, Digital Technologies and Oil & Gas through to Renewable Energy & Forest Industries. Digital and its power to transform industries, companies and society is an area that Steve is passionate about and helping to create & sustain digital economy ventures of scale, value and delight in Aberdeen today is one of his primary responsibilities & challenges.</p>
<p>David Holmes Chief Industry Executive, Oil and Gas, EMC</p>
<p>As Chief Industry Executive for the Global Oil & Gas Program, David is responsible for developing EMC's Oil and Gas upstream solutions and product positioning strategy in conjunction with the Brazil Research Center and Global CTO Organization. Works with partners and clients to identify oil and gas business needs and designs solution architectures to support these opportunities.</p> <p>David has served on a number of industry groups, and has delivered numerous technical papers at conferences around the world. He holds a patent for his work on the remote visualization of geotechnical applications.</p>
<p>Mark Claxton Energy Sector Director, Tessella Limited</p>
<p>Mark has worked for Tessella since graduating as a Computer Scientist 35 years ago, first at UKAEA Harwell (birthplace of Tigress and other 3 phase models), JET the Fusion lab, then responsible for business development across Oil, Gas and Nuclear customers.</p> <p>He has been a Fortran Programmer, IBM Systems Programmer and worked for clients as diverse as Unilever and BP. In all cases modelling, Big Data and Analytics are core to the work being undertaken by Tessella since 1980.</p>

Henri Blondelle Business Development Manager, Data Management Services, CGG
<p>Henri Blondelle is a geologist by education. He started his professional career in the 80's at the early days of the workstation development with BP then with CGG.</p> <p>Since 2012, he is in charge of business development for the new CGG branch of Data Management Services and defining future strategies for this activity.</p>
Alan Pointing Global Data and Information Management Delivery Manager, Maersk Oil
<p>Alan has spent 25+ years in the oil and gas industry and joined Maersk Oil in Oct 2010. During his career he has worked in various roles in geophysical research & technical services, IT, consulting, and project and programme management, but his real passion and focus is data and information management.</p> <p>His current role at Maersk Oil is as a subject matter expert overseeing key initiatives, which includes the optimization of 3rd party data vendors and implementation of a global document management system.</p>
Niall O'Doherty Director Business Development, Manufacturing and Energy, Teradata
<p>Niall O'Doherty leads a team that is helping global companies to do more with their data. Niall has particular responsibilities for entering and growing new industry sectors for Teradata International, covering an area from Ireland to Japan and from Russia to Australia in industries as diverse as Oil & Gas, Automotive, High Tech, Utilities and Pharmaceuticals.</p> <p>He is very focused on the value of detailed and complex data and especially the proliferation of "Big Data" and the associated analytics that are required. Before joining Teradata in early 2002 Niall worked for BearingPoint (KPMG Consulting), Johnson & Johnson and E&J Gallo Winery.</p>