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INDIN'2016 Tutorial

Title:

On Big data Driven Digital Ecosystems & Technologies (DEST) and their Knowledge Management.

Presenter(s):

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Brief Description of Tutorial:

In many industries, largely the data sources are heterogeneous and multidimensional. They are characterized by multiple volumes and varieties. As an example, oil and gas upstream has such big data volumes and varieties in multiple domains. By virtue of varying geographies and complex topographies, petroleum data sources in multiple domains have periodic and geographic dimensions. In addition, business rules in these industries change quickly because of fast changing resources' business scenarios. To demonstrate big data concepts in the resources' business, various petroleum systems are considered in the context of Middle Eastern regions. For sustainable business and diverse operations in the Middle Eastern regions, as a part of digital ecosystems and technologies (*DEST*) approach, design and development of petroleum management information system (*PMIS*) and petroleum digital ecosystems (*PDE*) are articulated, simulating a robust and holistic integrated framework. Big data tools and technologies that drive this framework offer modelling and integrated solutions with improved understanding of systems' connectivity. Other artefacts in the framework are data mining, visualization, data analysis and interpretation that add values to *PDE* and its associated projects. New knowledge is obtained on petroleum exploration & production (*E&P*) to make future forecast of resources in the hugely spread petroleum provinces in the Middle Eastern regions in a sustainable manner.

The purpose of this tutorial is to explore the big data opportunities in an oil & gas upstream. The big data hype motivate the authors to develop a design science information system (*DSIS*), which is articulated by an integrated framework. This framework caters the data modelling, data warehousing and mining of volumes of data sources, associated with petroleum systems of large-scale sedimentary basins. The real hype of big data depends on the size and type of basin or groups of basins, petroleum systems and oil & gas fields described in such hierarchies. Data sources of elements and processes of petroleum systems that describe structural, stratigraphic and strati-structural events need a robust and holistic ontology based heterogeneous and multidimensional data warehouse approach with constructs' modelling, data mining, and visualization and interpretation artefacts. Big data tools facilitate the generalized conceptualization, from global scale to specialization, local scale events as simulated in digital ecosystems' scenarios. Big data has power of connecting various ecosystems of sedimentary basins. The *PDE* approach is a *digital oil field* solution in various application development domains such as conventional and unconventional petroleum systems, carbon emission ecosystems and even turbulent resources management.

Intended Audience:

Data analysts, resources managers, oil & gas explorers, IS researchers, academicians and upstream business development managers.

The audience in terms of expected knowledge in the material: basic, medium, advanced:

Level of knowledge is basic and medium.

Presenter(s) Biography:

Dr Shastri L Nimmagadda has been associated with the oil & gas upstream industry for more than 25 years. Shastri is currently a research fellow at school of information systems, researching on “IS/IT tools for managing heterogeneous and multidimensional data sources in oil & gas industries”. He has been an expert with the Schlumberger Company in Jakarta, Indonesia and Moscow, Russia. Shastri, as a senior seismic interpreter was involved with several exploration and field development onshore and offshore projects worldwide. Currently, Shastri is a research fellow at School of Information Systems, Curtin Business School, Curtin University, Australia. He worked for several petroleum companies in India, Australia, Uganda, Kuwait, UAE, Egypt, Malaysia, Indonesia, Colombia and Russia. He did his M Tech and PhD in Exploration Geophysics from the Indian Institute of Technology, Kharagpur, India, PhD (infosys) and Master of Information Technology, Curtin University, Australia. His current research interests are heterogeneous and multidimensional data modelling, data warehousing and mining, data visualization and interpretation. He published and presented more than 80 research and technical papers, relevant to oil & gas exploration and information systems, in various international journals and conference proceedings. He successfully organized IEEE international conference tracks in Istanbul, Turkey, Dubai, UAE and Porto Alegre, Brazil. Shastri is a professional member of AAPG, SEG, SPE, IEEE, ASEG, IGU and EAGE.

Publications

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