



Let's Solve

# Whitepaper

## Digitization of Legacy Petrotechnical data

**Authors :** Dr. Jagadish Chandra. M - Sr. Manager / Sr. Consultant - Oil & Gas



A Larsen & Toubro  
Group Company

# Contents

1. Upstream Document Digitalization .....	3
2. An Accelerated Approach to Reinterpret Basins and Reservoirs .....	3
3. Summary - Document Digitalization .....	3
4. Inaccessible Data - the New Roadblock .....	3
5. Digitization of Legacy data for Better Organized Accessibility .....	4
6. Digitization factory (Paper to digits) .....	5
7. Integration & automation .....	6
8. Seamless data availability for enhanced end-user experience .....	6
9. Conclusion .....	7
10. About the Author .....	7

## Upstream Document Digitalization: An Accelerated Approach to Reinterpret Basins and Reservoirs

### Summary - Document Digitalization

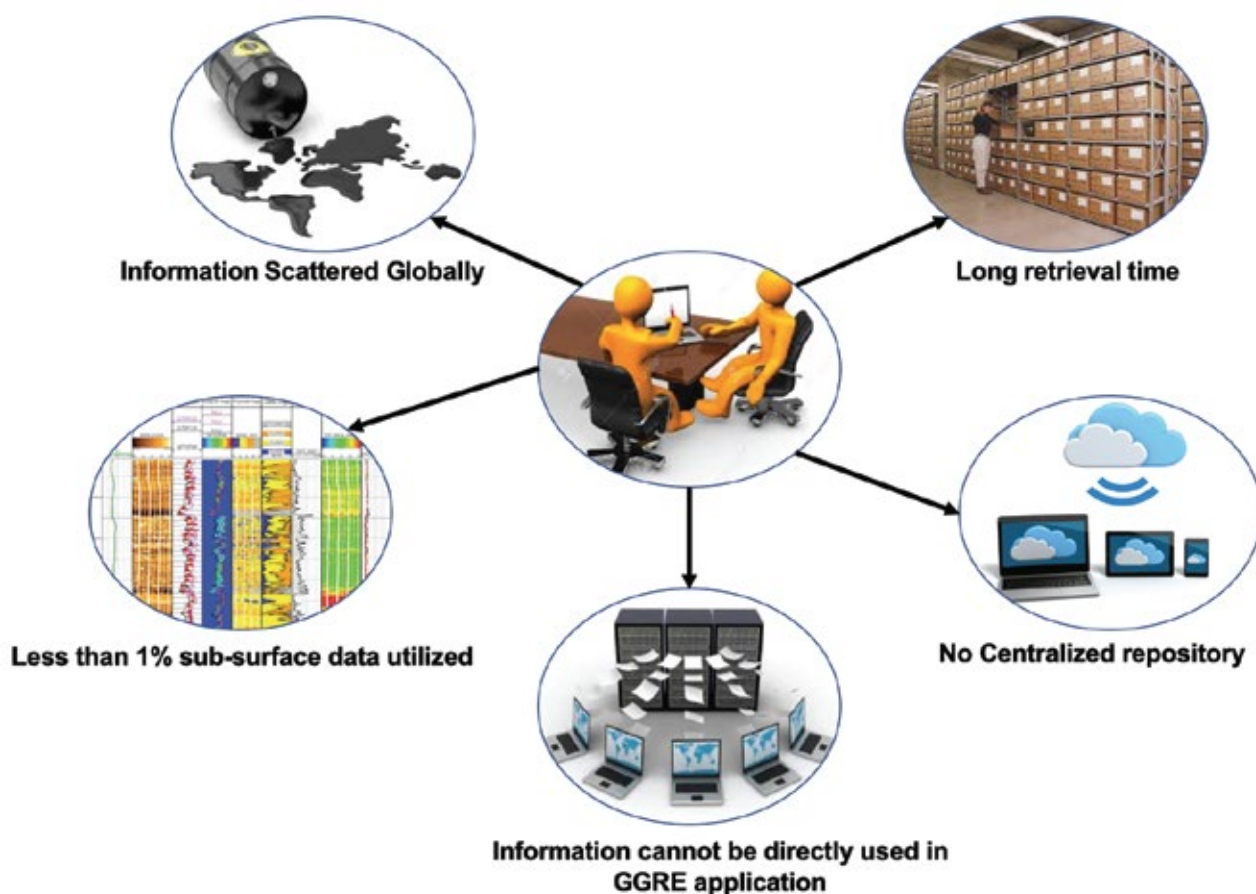
Over past decade, crude oil prices are at the sliding edge, which averages around 58\$ per barrel for the three quarters of the year 2018. Oil and Gas industry is transforming towards adopting cost-cutting techniques in competing with the crude prices depreciation. Information Technology plays a crucial role in reducing the operational cost of the assets by leveraging Artificial Intelligence, Predictive Analytics, Machine Learning and utilizing BOTS. In implementing all these robust technologies, data is the fundamental asset for executing the analytics over the current and historic data. Oil Industry is one of the oldest industry, which is more than 150 years old, where in lot of geoscientific evolutions have been evolved in increasing the recovery capacity from the subsurface reservoirs. In this process of evolution, lot of Geoscience studies like geological, geophysical and geochemical analysis are carried for understanding the crude oil formation studies and its existence in the subsurface basins. During this studies lot of data is acquired and stored in paper format for future studies, as crude prices are vibrant, they change from time to time, so the stored historic data is utilized to re-interpret the basins when the crude price is at appreciating.

Oil and Gas industry is older than a century, most of its asset data is stored in physical format, which needs to be digitalized for assisting the latest

cutting technologies in providing the analytics platform by reducing the operation cost and re-interpreting the existing basins and reservoirs. This process of Digitalization proves the data to be online for faster and better decision making along with saving the operation cost utilized for storage of the documents in warehouse. Another key advantage is documents longevity is increased as they are stored in online and which will be utilized by future generations.

### Inaccessible Data – the New Roadblock

Billions of dollars have been invested in the past to capture various set of data for exploration activities. All these captured historical data like Seismic, well logs, maps, reports, etc. in the form of paper and physically stored them in the data warehouse. Less than 1% of this GGRE data is utilized for the decision making. Energy & Petrochemical businesses are continuously striving to learn the usage of the vast volume of real-time and vintage data generated through years for robust decision-making. Most of the retrieval time for the data from the warehouse takes a long period of time, leading to an increase in the cycle time of data interpretation and reducing the efficiency of the process. The solution lies in identifying measures to get hold of decades of sub-surface legacy information, streamline them and make them accessible for various interpretation and time-critical projects.



### Digitization of Legacy data for Better Organized Accessibility

One of the many initiatives taken by the industry especially in the upstream sector, is of utilizing the inaccessible legacy data. Digital transformation gives a path for complete reevaluation of how things operate. These can include reassessment of basic assumption made for the interpretation and analysis. To develop better processes and management for optimal business compliance, many organizations decide to implement a "Paper to Digit" process. This process works well with large quantities of data and gives capability to successfully manage such high volumes of content for searchability, automated workflows, auditing and retention.

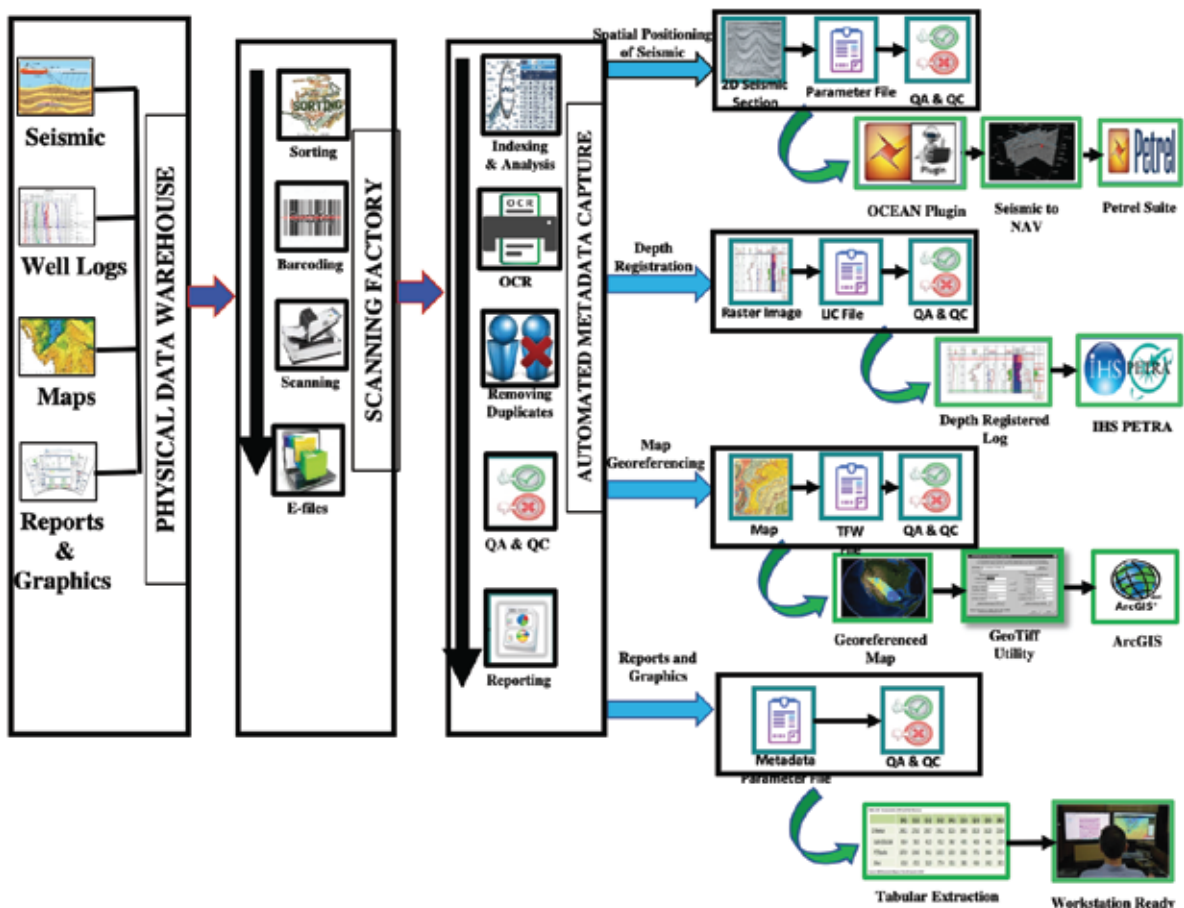
Digitization of these legacy data helps in exploring and exploiting new opportunities from the liberated old data. The aim here is to make the sub-surface data available in such a way that it is accessible worldwide to all the user who require these kinds of information to run analysis and do interpretations.

### Digitization factory (Paper to digits)

**Scanning of the documents:** Proprietary software are used for restoring aging hard copy paper documents to a digital format. Categorizing document according to data types (Seismic, Logs, Maps, reports such as geochemical, PVT, WCR, DPR, core analysis, cutting sample, etc.). With the data scanned and preserved, it can now be used to add value to current and future interpretation activities.

**Metadata Capture & Advanced Process Offering:** Capturing metadata is critical and needs to be efficient. It acts as a powerful tool to provide trackability, searchability and validation of information which is huge in amount, when it comes to O&G domain. Metadata is captured using advanced algorithms are designed to capture metadata automatically using OCR, ML & advance analytics.

Once the metadata is captured, these scanned images are then further processed in their respective domain. Well Logs are depth-registered and maps are geo-referenced, and can be directly used in GGRE applications. The concept of In-House Ocean Plug-Ins was developed to bridge gaps for the automated data upload. It helped in converting scanned seismic image into digital format and attached it to the respective navigation data in SEGY format, which can be further analyzed using Petrel. The processing delivers trusted, workstation-ready data in Industry Applications like Petrel, Petra & ArcGIS.



### Integration & automation

Fast and easy access with effective management of any data is necessary to restructure operations and effectively implement new technology. Automation intervention in retrieving and structuring the data will speed up the process and improve the overall efficiency of the system as well.

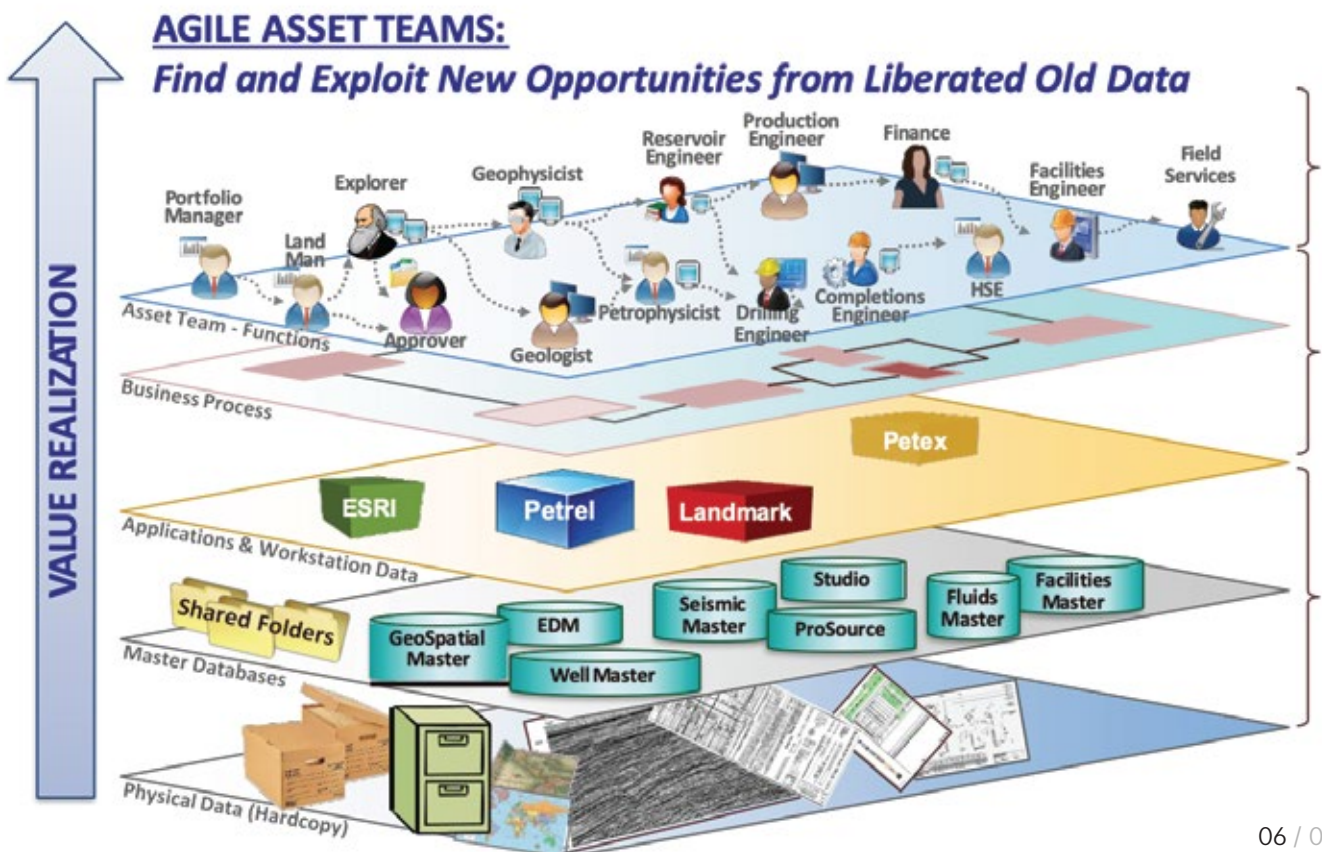
Various Initiative are being taken to introduce automation in this process of digitization. One of the successful efforts was to create in-house tool, which aimed towards bridging gaps for automated data upload. The plug-in offers conversion process as inexpensive and replaces various software packages, diminishing labor-intensive effort that was required to achieve the desired results.

With abundance of data available to digitize, it rather becomes crucial to conceptualize such automation techniques that will accelerate the

process. Other aspects of automation are also being explored in for Logs and Maps as well. Research work is in process to automate the process of geo-referencing and depth registration.

### Seamless data availability for enhanced end-user experience

Digitization process of legacy upstream data starts with scanning and ends by providing ready-to-use data in various GGRE software. This helps in Increased well file access, security and efficiency. No more storage rooms, file drawers and missing data. Along with this, it also helps in reducing the data retrieval cycle time to a much lower level. One of the crucial aspects of the project is also to deliver trusted, workstation-ready data in Industry Applications like Petrel, Petra & ArcGIS. Rule-based automation also helps to reduce quality defects from data entry processes or during data conversion procedures.



## Conclusion

Digitization will bring various business benefits in terms of time, resources accessibility and user interpretation efficiency. Decision-making is about an organization's ability to use the right data at the right time. Paper to Digit transformation through Data-as-a-Service model will enable quick access of legacy data in modern day workstations, irrespective of geographical location, and give 100% searchability etc. This transformation of data from support function to value generator will help the organizations to reassess their field potential and optimize their ultimate recovery efficiently.

## About the Author



### **Dr. Jagadish Chandra. M**

Sr. Manager / Sr. Consultant – Oil & Gas

Jagadish is a Geologist specialized in Petroleum Exploration and Mining domain, with a Doctorate in Geology. Jagadish brings with him 13 years of experience in Geo-science Data Management. He has diversified experience with projects, such as Oracle ERP – CRM, Electronic Well File, Data Quality Management, Petro-technical Digitalization, Data Cleansing, NextGen GGRE Data Migration and GGRED application support services.

---

LTI (NSE: LTI, BSE: 540005) is a global technology consulting and digital solutions Company helping more than 350 clients succeed in a converging world. With operations in 30 countries, we go the extra mile for our clients and accelerate their digital transformation with LTI's Mosaic platform enabling their mobile, social, analytics, IoT and cloud journeys. Founded in 1997 as a subsidiary of Larsen & Toubro Limited, our unique heritage gives us unrivaled real-world expertise to solve the most complex challenges of enterprises across all industries. Each day, our team of more than 28,000 LTites enable our clients to improve the effectiveness of their business and technology operations, and deliver value to their customers, employees and shareholders. Find more at [www.Ltinfotech.com](http://www.Ltinfotech.com) or follow us at @LTI\_Global