Creating an end-to-end exploration

On December 1, 2017, Emerson the US based global technology and engineering company completed the purchase of Paradigm®, a leading provider of software solutions to the oil and gas industry. The combination of Paradigm with Emerson’s Roxar software business creates a comprehensive E&P software offering that will help operators increase efficiencies, reduce costs and improve investment returns within new and established reservoirs and across the reservoir lifecycle.

Chief Editor, DEW Journal talked to Eirik Gudmundsen, Global Sales & Marketing Director at Roxar Software Solutions and Indy Chakrabarti, Senior Vice President of Product Management and Strategy at Paradigm to discuss what this means to the industry and the latest Roxar and Paradigm software innovations.

Eirik, can you tell me what the thinking was behind the Emerson acquisition of Paradigm and what it will mean to operators in the E&P industry today?

Eirik: We all know how competitive the current oil & gas industry is – with Asia no exception. Operators today need to be able to access intelligent data facilitated by embedded technologies to make those crucial decisions on where to invest and allocate capital and ensure returns on assets.

The combination of Roxar and Paradigm software – alongside Emerson’s high precision digital measurement and automation solutions – provides operators with the intelligent information and tools they need to meet these challenges, increase operational capabilities and drive Top Quartile reservoir performance.

Emerson is a ‘decision’ company - helping operators with the decisions that really matter. Emerson software provides operators with robust reservoir predictions and Emerson digital measurement sensors provide the necessary data to enable operators to both make strong, commercial investments and increase production performance.

What do you mean by Top Quartile reservoir performance?

Eirik: Emerson has a clear goal across its business – to help operators increase efficiencies and achieve Top Quartile Performance on investment and operational goals within new and established oil & gas reservoirs. Top Quartile Performance is defined as achieving operations and capital performance in the top 25 percent of peer companies. We are already achieving this with many of our customers and intend to expand this to all. The combination of Paradigm and Roxar software can only go to strengthen this goal further.

What does the Paradigm software portfolio brings to the table?

Indy: I think that Paradigm fits perfectly into the Emerson vision that Eirik has just outlined. Take the greater focus on digital automation and analytics across the reservoir lifecycle and the increased focus on the cloud, machine learning and data analytics.

This is an area that Paradigm software and workflows are already embracing, having a deep
understanding of the distinctive data diversity, complexity, storage requirements, and demanding visualization and computational needs of the industry. We have already introduced machine learning into areas such as seismic interpretation and log interpretation and - with Emerson’s digital expertise and Roxar software - intend to take digitization across the reservoir lifecycle.

Will you be able to leverage Emerson’s automation and digital expertise?

**Eirik:** Absolutely, Emerson’s expanded services will now enable oil and gas operators – through machine learning, cloud computing and analytics – to make decisions in the field leading to more efficient operations. It will also improve interoperability and connectivity between different functions – too many of which were siloed in the past.

The fact that Emerson was recently named ‘Industrial Internet of Things Company of the Year’ by IoT Breakthrough, part of the Tech Breakthrough Awards Organization shows how far Emerson has already gone in using process automation and deeper data insights to improve operations.

**Indy:** We are now also uniquely positioned to digitally integrate reservoir planning and management with topside operations. We expect a number of developments in this area over the coming months and years as we provide an integrated, digital solution to our customers.

And from a geology and geophysics and subsurface perspective, what does this acquisition bring?

**Eirik:** While operators continue to look for new assets, the generation of high-fidelity models and viewing of existing reservoirs to maximize production and avoid non-productive drilling and exploration costs has never been more important.

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So what do Roxar and Paradigm have in common?
Indy: We have shared traditions of innovation; a shared culture of getting it right and never stopping until we have surpassed customer expectations; and a commitment to reducing complexity and providing accessible and innovative software workflows for all.

What software solutions will Emerson be now providing as a result of the acquisition?
Eirik: Emerson will be the largest independent provider of E&P software solutions. We will span the complete reservoir characterization and production modeling workflow from seismic processing and interpretation right through to production modeling. We believe this is compelling proposition to the market.

And what are all the elements of the new E&P workflow then?
Indy: The Emerson E&P workflow covers seismic processing & imaging; seismic & geological interpretation; formation evaluation; reservoir characterization, modeling and well planning; reservoir engineering and simulation; well construction, drilling and geosteering; and production modeling.

In summary, from exploration and prospect evaluation right through to simulation and day-to-day production operations, we provide operators with everything they need to make profitable investment and field decisions – acquiring and interpreting data and using this for optimal production decision-making.

Eirik, you mention being independent of oilfield services companies. Is this important?
Eirik: Yes, I believe it is. Being independent means that our end goal is to recommend solutions that are right for the customer’s needs without self-interest. With Emerson, you can be sure that you will get the best possible advice on the specific software and production solutions that work for you.

Will you shed light on your current product portfolio and recent developments. What recent developments have there been in the Roxar software portfolio?
Eirik: We had a busy 2017 with a number of new product launches and expect the same
to be the case in 2018. If I could highlight one technology development and product that has become the cornerstone of Emerson’s reservoir characterization and modeling workflow, however, it would be the Roxar Big Loop™ workflow.

It’s crucial that any reservoir characterization and modeling process realistically represents the underlying seismic data. Any model that oversimplifies geological complexities is not going to deliver the vital information operators require today. However, too often, uncertainties are neglected, leading to incomplete or misleading interpretations of the available data

The Big Loop™ workflow, however, tightly integrates static and dynamic domains and offers the propagation of uncertainties from seismic characterization through to geological modeling and simulation. This means that reservoir uncertainties are captured and varied as input parameters, creating an ensemble of realistic reservoir models that all feed into the reservoir simulator.

The result is a better understanding of the reservoir geometry, more robust reserves estimations, and better-informed decisions for future field development scenarios – exactly what operators require and what we believe is a real step-change in the reservoir characterization process.

Have you developed the Big Loop™ solution in partnership with customers?

Eirik: Yes. We have worked very closely with Statoil over the last few years in developing and testing the Big Loop™. Only last November, we signed a new collaboration agreement where Statoil will share with us some of its Intellectual Property from its internal “Fast Model Update” (FMU™) workflow that operates within the Roxar RMS reservoir modeling work.

The goal will be to make both workflows even more efficient with areas covered including improving efficiencies, quality control (QC) of subsurface reservoir models, the handling and analysis of big data, and information management. The partnership will also be crucial in supporting advances to the Big Loop™ solution.

Have you had any other significant product launches over the last 12 months?

Eirik: We have had two major launches over the past year - Roxar Tempest 8.1 and Roxar RMS 10.1

Roxar Tempest 8.1 brings reservoir engineers more tools to maximize the potential of their fields as well as enhanced field productivity thanks to greater simulation performance, improved uncertainty analysis, and an integrated workflow from geosciences to production.

Roxar RMS 10.1 introduces extended functionalities within the seismic domain,
“Emerson’s expanded services now enable oil and gas operators, through machine learning and cloud computing, to make decisions in the field leading to more efficient operations” alongside the Paradigm software portfolio – will directly address operator needs.

What about your production modeling suite – Roxar METTE? I know you incorporated this into your solutions portfolio in 2015 after the acquisition of Yggdrasil. Have there been any developments to the software?

Eirik: Very much so. Roxar METTE has helped operators align their modeling, uncertainty quantification and simulation data with production plans and has enabled us to take our workflow from seismic acquisition and interpretation right through to production.

The result for operators is an integrated production management system across the reservoir management lifecycle that provides a complete overview of the field and contributes vital input into future production plans and engineering activities. We plan on launching the next version – Roxar METTE 2.0 – over the coming months.

Indy, tell me about the latest innovations within the Paradigm software portfolio.

Indy: Last year was an exciting time for product innovation for Paradigm. At a time when many other vendors were challenged to deliver new capabilities, Paradigm continued to provide a great return on customer investments.

We took a significant leap in product integration, bringing our interpretation capabilities into a single unified interface. We also tightly unified our market leading processing and imaging solution with our geologic modeling solution. This means end users can create more accurate velocity models and iterate them faster.

We also introduced two cutting edge capabilities. A new machine learning solution that can predict oil bearing formations that has proven highly accurate in customer implementations. And our first foray into the cloud. A new product for production optimization that uses breakthrough new science to deliver flow predictions in minutes rather than days!

But our next release is now already just around the corner and we have some exciting new announcements in store.

Share a few short words on where the industry currently stands, the benefits of combining Roxar and Paradigm software, and predictions for the future?

Eirik: While 2017 was a year where operators looked to stability and a repositioning of their portfolios, 2018 is, I believe, the year for profit growth.

Emerson – strengthened by the combination of Roxar and Paradigm software – is uniquely positioned to enable this to happen, uniting technologies to support the decision-making process across the reservoir life cycle and putting intelligent data, knowledge, digital automation and analysis in the hands of key decision makers. Exciting times lie ahead for all of us.

Indy: I’d echo those comments. Emerson’s Paradigm and Roxar software stand at the center of a broad ecosystem where real-time intelligent data from the field is continually fed back for analysis by geophysicists, geologists, reservoir engineers, drillers, asset managers, production engineers, auditors, and senior managers.

In this way, decisions can be made with the latest information, reducing risk exposure and delivering investment returns. We are delighted to be part of the leading independent, global provider of E&P software solutions.