

BHGE Annual Meeting 2018

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Panel: Bringing global capabilities to meet local needs

30.01.2018 h. 9:20

[draft for panel discussion preparation]

Technology

Why technology is a must for the Oil&Gas Industry of the Future

The crisis which has affected the Oil&Gas Industry has raised important questions about the fundamentals, the efficiency and effectiveness of the Oil&Gas organizations, their methods, processes and technologies, however it has been also giving a great opportunity: it has been a strong impulse to innovate, seeking alternative solutions and approaches, implementing new strategies “outside the box”, with the aim to reduce production costs and time to market of new developments. I think that technology & innovation are a sort of synthesis of the dualism between the urgency of short term concrete actions to react to the crisis and the need to develop new solutions in order to maintain the competitive advantage in the medium to long term.

After almost 4 years of crisis the O&G Industry has already cut capacity, reduced headcount and overhead, and tightened capital budgets as they waited for a recovery. This is a just the first step that we - as Saipem but also as Industry - have almost completed. We’ve also started a second step linked to the need to cut costs along the value chain and along the operations. This I think is still in progress and I believe there still so much to do. The industry that has been emerging from this low-price environment looks already quite different from the one that entered it and we cannot simply looking cost-cutting to determine what to do next to thrive in a prolonged period of price weakness. We must be looking beyond our own organizations to find novel ways to lower our customers’ costs through more efficient technologies and processes. The imperative now is pushing technical boundaries at the frontiers to create efficiencies that allow us to operate sustainably over the long term.

In a world which is changing so fast, only firms having an innate sense of innovation in their DNAs, may intercept these transition models, with a role of “technological engine” able to transform the “business as usual” approaches, methodologies and ways to operate to push the boundaries and go beyond the limits.

The second digital age for “Glocal” Operations

Oil and gas companies were pioneers of the first digital age in the 1980s and 1990s. Long before phrases such as big data, advanced analytics, and the Internet of Things became popular, oil executives were making use of 3-D seismic, linear program modeling of refineries, and advanced process control for operations. The use of such technologies unleashed new hydrocarbon resources and delivered operational efficiencies across the value chain. Thanks to the latest technological advancements, we are now poised for a second digital age that could further reduce costs, unleash unparalleled productivity, and boost performance significantly.

There’s another fundamental issue that the technology innovation is going to impact and it is the social cost of fossil production. Most of the energy mix scenarios, even the more challenging ones - as far as the renewables development is concerned – agree that the oil & gas demand will be sustained for years. As a consequence, we have a great responsibility toward the future generation: our industry will have to progressively reduce the “social costs” of oil production, reduce the foot print of oil&gas development and reduce the impact in terms of climate change. And technology innovation has a key role in this path, it must contribute to maximize the energy use and the enthalpy gradient through the entire value chain, from the upstream, to the middle stream and finally the downstream phases, targeting a kind of circular economy (e.g. through CO₂ recovery and transformation, hybridization of the O&G field developments, etc..).

The oil and gas industry is tailor-made for this transformation: operations typically span multiple regions, with different rules, peculiarities, technologies, tools and supply chains. The visibility and clarity delivered by digital technologies and advanced analytics can give executives unprecedented, granular views into operations, increase agility, and support better strategic decision making. Digital enablers, from process

digitization to robotics and automation, can also help realize this potential by supporting processes in dynamic ways. While advanced analytics are being used to transform functions such as engineering, procurement and marketing functions to support better decision making, the latest technologies, such as drones and equipment sensors, internet of things, and the ongoing “digitalization” processes are also revolutionizing the construction, installation monitoring and maintenance phases. In the construction and installation fields, these technologies could improve the remote monitoring and assistance methods, thus improving efficiency and reducing the requested manpower at sites.

Companies need to reinvent themselves to improve productivity and investing in digital technologies, and this is a no-regrets move. It could be the difference between leading the next wave of industry innovation and being left behind.

Get access to technology – What Saipem is doing

Our Innovation strategy is driven by both projects and needs of O&G industry, with a short and middle/long-term view to timely catch evolutions in the scenario where it becomes crucial an extensive technology intelligence activity.

Saipem develops its collaboration network, via Joint Innovation Programs, with clients, vendors, universities and research centers.

We recently pushed this effort even further, given the urgency of exploiting the digital technologies, and enlarged such network through partnerships and open innovation joint projects with major technological players, start-ups, academic spin-offs. Recently, in particular, we came across companies owning disruptive technologies and we are now finalizing relevant agreements.

One and a half year ago we’ve launched a new initiative which we called Innovation Factory: an idea incubator aimed at testing solutions to address the challenges of the energy sector, by adopting new technologies and methodologies, and gain a boost in terms of productivity to secure competitive advantages.

A cluster of our most talented young people, drawn from different professional backgrounds, are working on strategic themes identified by top management. They are working in a dedicated physical space, where they can express their creativity without constraints. Their task is to leverage lateral thinking and creative problem-solving to generate innovative ideas and take forward to prototype those deemed valuable. This

experience is helping to promote an innovative and collaborative culture throughout the company.

Recently with our Innovation Factory we have launched a project to create a “digital site” meaning the digital twin of the site thus enabling a virtual space to increase efficiency and productivity of construction activities by improving the design, planning and operational phases implementing common data platforms, advanced material management techniques and process automation. Few examples:

- **wireless sensors** were used in tandem with cloud data platforms in our core production processes. Numerous advantages were observed, such as the real-time measurement of fabrication progress, full-cycle traceability of materials in warehouses, improved health and safety of Saipem personnel;
- **drones** proved to be highly effective and their implementation likewise feasible for inspecting structures at height and for yard material recognition and scanning for real-time warehouse inventory updates;
- The low-emission **digital X-ray technologies** tested resulted in a substantial time savings and greater availability of real-time radiographies in addition to improvements in personnel safety due to limited emissions.

As regards the more conventional world of Technology Innovation, our efforts are continuing in the strategic market of Subsea, also widening our portfolio to areas not yet commercial. We are currently working on innovative solutions capable of changing how existing subsea fields, or new subsea infrastructures, will be developed, by reducing the total cost of ownership. As an example, our Active Heating technologies are enabling the tie-back of fields at longer distances and with larger pipe diameters.

The SPRINGS subsea technology, developed together with Total and Veolia, is able to reduce the sulphates contained in the sea water injected into a reservoir and, as a consequence, to increase the field’s production.

We are also working on a new concept of a permanent subsea infrastructure. This is chiefly composed of a new hybrid ROV/AUV called «Hydrone», which will enable the Life of Field management services to be conducted as an extension of the EPCI offering.

As regards the onshore business, while we intend to leverage our excellence in Fertilizers and LNG, at the same time we are developing new breakthrough approaches for CO2 management, also for upstream applications. In the area of assets, we intend to modernize our fleet, through adoption of new products, and automation and digital technologies and devote time and attention to new concept selection for construction vessel of the future.

Saipem is also facing the technological and digitalization challenges by focusing on the development of new collaborative design methodologies, such as the XDim® platform which will materially change the way to manage our projects and will help us to improve efficacy and efficiency. This, I believe, will also allow us to exploit new value propositions, new segments and markets at, possibly, higher marginality. Internet of things and artificial intelligence will allow us to make use of the huge amount of information we already have to better work in the near future. Just to give you the flavors of the potential of these tools, we could make use of data related to previous engineering solutions applied to previous projects to be replicated in other developments/projects where we can rely on similar starting points in terms of fluids characteristics, climate conditions, ground conditions, layout constraints, etc...reducing the time needed to conceptualize and develop engineering, procurement and construction activities, but also reducing costs.

Local know-how

How to navigate new markets and accelerating the local learning curve.

Historically in Saipem, whenever we have decided to invest in a new market, in a new area, in a new country, we've decided to do it with an industrial approach, rather than a purely commercial one.

It is an approach that do not merely wish to develop a logistic base in the country in support of its sales activities, but one that lead for example, to the creation of an engineering and construction company with local employees or a fabrication yard or both of them.

It is a an approach that while creating added value for the company, also always develop significant local content. Three are the main goals:

1. Developing local skills through a strong cooperation with local communities, universities and authorities;
2. Transfer of know-how and technology by proactively interact with the entire value chain;
3. Always respecting the highest standards in terms of health, safety and respect of the workers and communities.

These aspects characterize the way in which Saipem operates all over the world.

In doing this the role of technology is fundamental. Technology helps to improve efficiency, it is a sort of common language we can use to communicate and demonstrate the best way to operate and it is vital for our industrial approach. Just to give you a flavors of what we are doing, we are strongly strengthening our training methods by making extensive use of digital technologies such as among the others digital twin of our assets and remote support centers.

I want to also emphasize that this is not a one-way process. We bring technology, we bring know-how, we bring methodologies and tools but we often receive know-how also in terms of finding different way to approach certain issues, process improvement, new IT tools developed locally. In a nutshell, for us it's a sort of additional open innovation leg []to improve our way to operate.

So, in conclusion, let me say that Saipem has always reacted to the local challenges with a business model focused on the creation of shared value, which means creating employment, developing local skills and capacity, transferring and receiving know-how, collaborating with local suppliers and subcontractors and enhancing local entrepreneurship with its operations.

We firmly believe this is the right approach to develop durable and sustainable win-win relations with all local stakeholders, helping to reduce costs and risks associated with projects, improving the perception of the Company and creating the conditions for a climate of mutual trust.