



Indian Institute of Technology  
(ISM), Dhanbad  
SPE Student Chapter

# THE GAZETTE

"ILLUSTRATING UNCONVENTIONAL PASSION"



IIT (ISM) DHANBAD, INDIA



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## ABOUT THE DEPARTMENT

Established as a source of petroleum engineers in the country the Department of Petroleum Engineering of IIT(ISM) Dhanbad has immensely contributed to the oil and gas industry since its inception in 1957. Counted among the best petroleum fraternity of research, it has undergone rapid developments from time to time to be at par with the requirements of the industry. With highly advanced lab facilities and experienced faculty the department has produced over 1200 undergraduate and 300 postgraduate students including both Mtech and PhDs who are serving the oil and gas industry across the globe with their technical expertise. With the advent of Simulation the department is digging into it and recently collaborated with Schlumberger Asia Services Ltd to inaugurate Reservoir Characterization Centre.

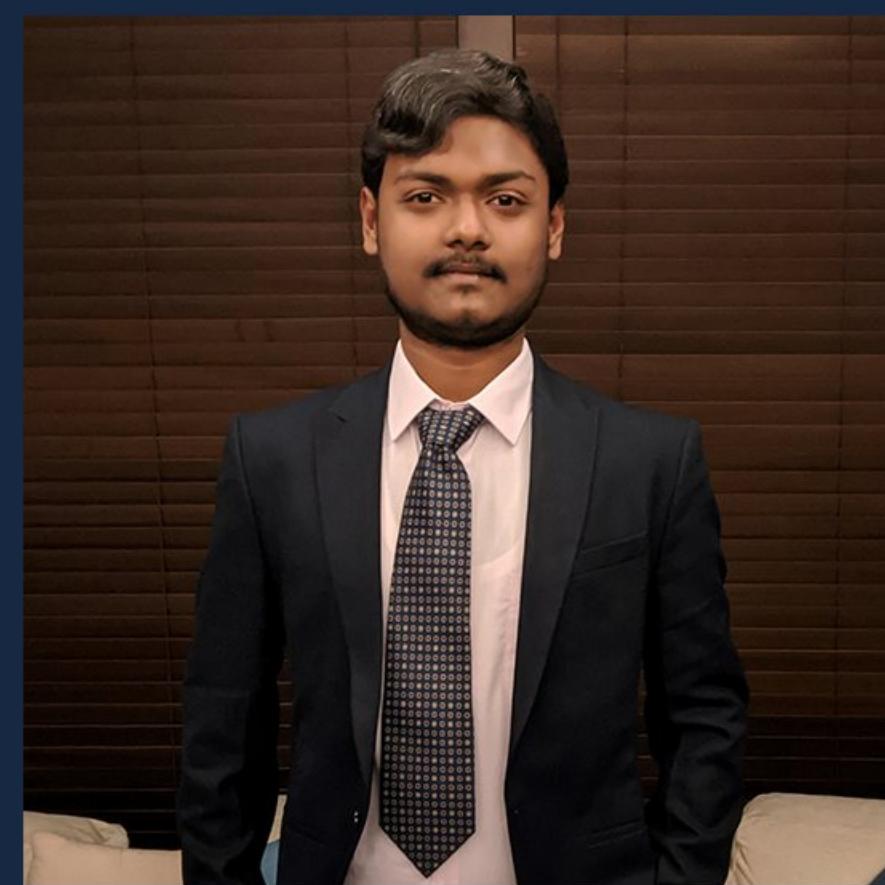
Collaborative programme with universities like University of Kansas, USA, University of Alaska Fair Banks, Imperial College of Science & Technology, London, Heriot-Watt University, University of Miskolc, Hungary etc. Encouraging the student chapters like SPE, FIPI, the department tends to polish the leaders for tomorrow to become better technocrats to serve the industry.

## FROM EDITOR'S DESK

“

The Oil & Gas industry is one of the most dynamic sectors that possess the power to dominate the world economy. Every major event that takes place has the ability to impact oil price which has witnessed massive fluctuations over time. It is imperative to maintain profitable operations at all times hence the demand for cheaper services with maximum recovery. This, along with immense potential to make a fortune, has inspired the innovative entrepreneurs to launch a number of upstream as well as downstream start-ups.

Gazette 9.0, “Illustrating Unconventional Passion” presents to you a collection of successful start-ups led by the passionate and audacious entrepreneurs with a dream to transform the Oil & Gas industry. It gives you a glimpse of the challenges faced during the extraction of unconventional reserves along with the changing rules & roles in our sector. We have also emphasized on the personnel safety and importance of cybersecurity in this era of digitization and cloud computing. I would like to acknowledge the guidance rendered by my seniors & conclude by thanking my team members who have put in immense efforts to give you an exciting insight. Enjoy reading!



*Debosmit Banerjee*  
EDITOR-IN-CHIEF

# About SPE IIT (ISM) Student Chapter



Indian Institute of Technology  
(ISM), Dhanbad  
SPE Student Chapter



## ACHIEVEMENTS

Chapter is devoted to fulfil the mission of SPE international "To collect, disseminate, and exchange technical knowledge concerning the exploration, development and production of oil and gas resources, and related technologies for the public benefit; and to provide opportunities for professionals and students to enhance their technical and professional competence.

In its endeavours to extend its social responsibilities, the chapter has conducted events like "GIVING TUESDAY" and setting up blood donation camps coordinating with "FAST FORWARD INDIA" an Institute founded NGO.



**Dr. Neetish Kumar Maurya:**  
**Faculty Convener**

It is an immense pleasure witnessing the dedication and enthusiasm shown by the students under SPE IIT (ISM) Student Chapter, and Gazette 2020 stands tall as a testimony to their efforts. The Chapter has clearly distinguished itself with the large number of varied activities conducted under its banner, with the students receiving enormous benefits that help them develop a dynamic skill set and adapt to the ever-changing Oil and Gas Industry. The exciting topics covered under the latest edition of Gazette are sure to provide the students a glimpse into the latest trends of the industry and the market.

**Ambuj Kumar:**  
**President**

"Individual commitment to a group effort - that is what makes teamwork." The sole aim of launching Gazette was to bridge the gap in between industry and academia, from the previous eight years Gazette has been effectively accomplishing its objective. I gladly present the ninth edition of Gazette, a miniature representation of ongoing activities in the industry and SPE IIT (ISM) student chapter. It unleashes a broad spectrum of creative skills ranging from writing to editing and designing this newsletter. I congratulate all the officer bearers for challenging yourselves and acing it every time in such an extraordinary way. Gracias!



**Harshit Garg:**  
**Vice President**

SPE presents a world of opportunities to anyone aspiring to be a professional in the Oil and Gas Industry. From the start of the journey as a student to being an industry professional, SPE offers a plethora of resources to develop interpersonal as well as technical skills. I am grateful to be a part of the Board of our Student Chapter, which has helped me evolve and prosper over the years. My sole suggestion for the members would be to participate in all the chapter activities actively and bring more innovative ideas on the table and execute them using the resources SPE provides all its members.



**Sanskar Jain:**  
**General Secretary**

SPE IIT (ISM) Student Chapter has accomplished a lot since it came about, entirely owing to the hard work and effort put in by its members over the years. As General Secretary, I strategically focused on making the presence of the Chapter more prominent online. Multiple initiatives like Beyond the Barrel, Fact Friday, and weekly newsletters were started across various social media platforms. The frequency of lectures, workshops, and team meets was also increased to enhance collective productivity. All Chapter activities were posted online, one of which, the "Tree Plantation Drive" even gained international recognition.

# Fuelled by Passion



## Prelude

With increasing global demand for energy and volatility of crude oil price, there is an ardent need to refurbish the upstream oil sector via innovation. The steep costs, profoundly long development times, and the utter complexity of oil and gas projects make it innately difficult for practical, radically game-changing ideas to manifest themselves into reality. But what we are witnessing now is a rapid growth combined with a surge in investment in start-ups.

## Adapt, Improvise and Proceed

With the advent of Industry 4.0, "anything which can be digitized will be digitized." It is now or never for the companies to invest in upgrading their technology. According to a survey, 33% of oil companies are cashing in on big data analytics, in which more than half are investing in IoT and the other half in mobile devices. Ranging from sensor-based hydraulic fracturing monitoring service to the smart-contract concept, start-ups have offered to cover a wide array of services which might be instrumental for the oil companies in earning a competitive advantage over their peers. But some of the prevailing companies encounter challenges at different levels- "inability to scale up innovations" and "excess of institutional control" being the major ones which often result in an ineffective collaboration between the two.

## What's in it for the Sharks?

Rapid technological changes across the other sectors make it compelling to bring about similar advancements across the entire energy spectrum. Shell, BP, ONGC, and a few others have made it a point to invest in start-ups offering to help develop new technologies that provide efficient business models in areas of their interests. The decision of investment in start-ups suffices two strategic interests- decentralization of the conventional system in place, and the possibility of higher revenues and improved efficiency.

## The Way Ahead

The shift in the general interests of the companies in start-ups is proof positive of the industry's drive towards digital transformation. The environment of oil and gas companies is changing owing to the disruptive nature of digitization. Mastering dynamism and stability would play a pivotal role in survival in the future. Agile organizations promoting fluidity in the team-up, having loose hierarchies integrated with instant feedback systems will come out on top.



# The Indian Crude Audacity

The Oil and Gas Industry is dynamic, extremely complex and challenging on technical fronts, but simultaneously provides ample opportunities for innovations & developments. In this dawn of changing trends and growing technology, start-ups have emerged up as new solutions in the petroleum industry in Indian markets. With this boom of technological advancements and the economic slowdown, there has been an enormous demand for new ideas, new methodologies to tackle the ever-changing scenarios. And here the start-ups take their place, gaining quite an attention in recent times.



## Detect Technologies

It is a start-up, residing at the intersection of hardware and intelligent algorithms, creating value for the oil industry partners by enabling the development of real predictive capability. Their convergent, digital paradigms, design experiences and innovation platforms help them to create tangible business value for their stakeholders. All the solutions are strongly supported by predictive algorithms for generating a quantifiable return on investments and delivering services to drive efficiency through innovation amongst all functions. This results in innovative and customer-centric inspection solutions, enabling enterprises, associates and businesses to rise.

## Seven Lakes Tech

Seven Lakes Technologies was founded in 2009 by Mr. Shiva Rajagopalan who expertises in developing enterprise analytics and workflow software solutions for upstream operators to optimize oil production while maximizing cash flow. These tactics used in Seven Lakes Tech have helped to save drive time, increase well time and avert downtime harnessing the power of mobility, cloud, big data and artificial intelligence (AI). Now, Seven Lakes Technologies has grown with over 40 independent and mid-major Oil and Gas companies located in Denver, Houston, Dallas, Midland, Bakersfield, Pittsburgh and Oklahoma City. Their technology empowers people to gain insights and take timely action on various activities of about 100,000 wells of the 1 million wells in the US.

## Antelopus Energy

This newly formed E&P company aims to improve the hydrocarbon potential of the nation by Value Creation through Reservoir Management and to incorporate operational efficiency. The company believes that taking into consideration India's 5% global oil demand and production of only 1% global oil supply, they need to bring new technology and boost private sector investment in the industry, which shall result in multi-fold growth in production in the coming years. They are also focused on monetizing discovered and stranded resources in the Indian Subcontinent.



# Prudential Innovations

"Innovation distinguishes between a leader and a follower." With technologies being more advanced and more pervasive, it's more important than ever for industries to adopt digitalization. Every start-up dreams of becoming a game-changer when it grows up and many start-up founders dream of a scalable trajectory that leads them straight to a billion-dollar business defining its niche. Let's have a glance at some of the start-ups outside India which have the potential to transform the Oil and Gas industry.



## Sensorfield

Strode Pennebaker, a third-generation engineer and fourth generation oilman, was seeking a simple and practical system to monitor the wells he was operating. So, in 2011, he started Sensorfield - a Houston based company with a goal to create a sensor the size of a refrigerator magnet that could stick on to a tank or pipe and deliver usable data to a mobile device or computer. Sensorfield has received some of the best reviews from its customers. The equipment allows us to know what exactly is going on in the oil field 24/7. The economical price, simplicity of installation and service has won against the older conventional systems.



## Tachyus Corporation

It's a start-up founded in 2013 with Parl Orland as its co-founder who also happens to be the current CEO of the company. Tachyus has its headquarters in Berkley, California, USA

**Mission** - The company aspires to provide the best technology required to make data-driven operational decisions that can maximize asset values. It works to increase production and cut costs in shale operations, steam and waterfloods. The company has provided great solutions like Shale optimization, waterflood and steam optimization, Co2 flood optimization.

**Accomplishment** - Operators of varying sizes have leveraged Tachyus across 25000 Wells to achieve up to 20% increase in production and up to 40% decrease in injection cost.

## PetroleumSoft

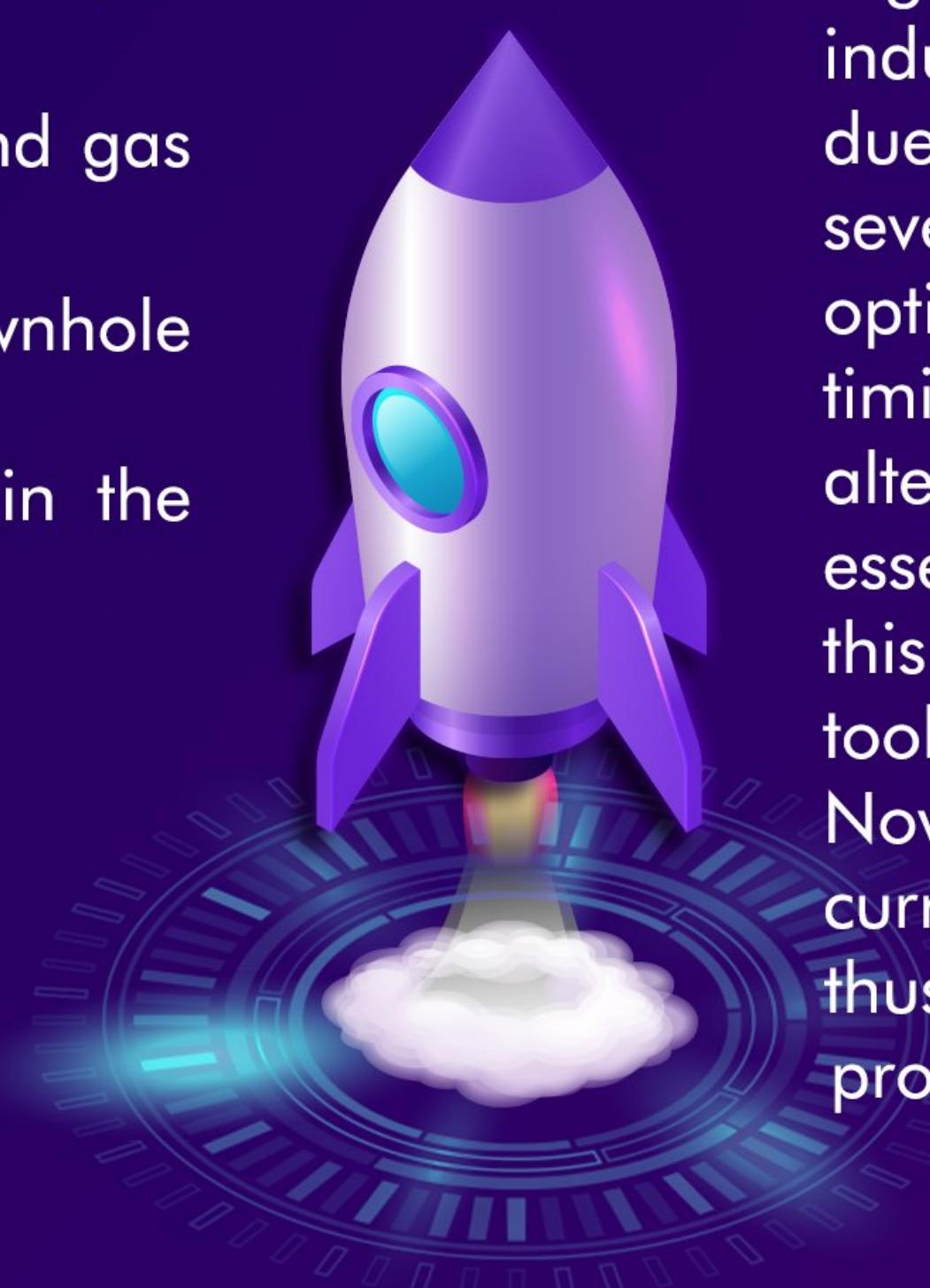
The start-up was founded in 2009 with its headquarters in Aberdeenshire, Scotland.

**Mission** - To provide excellent well stimulation job design and optimization for oil and gas industry by the newest and the most innovative software.

**Vision** - Become a leading simulation developer and service provider to the oil and gas industry.

**Expertise** - Analysis and optimisation of acid stimulation, hydraulic fracturing, downhole scale prevention and enhanced oil recovery.

This company provides complementary simulation technologies that big players in the industry have overlooked.



# Redefining Regulations



## Transformations

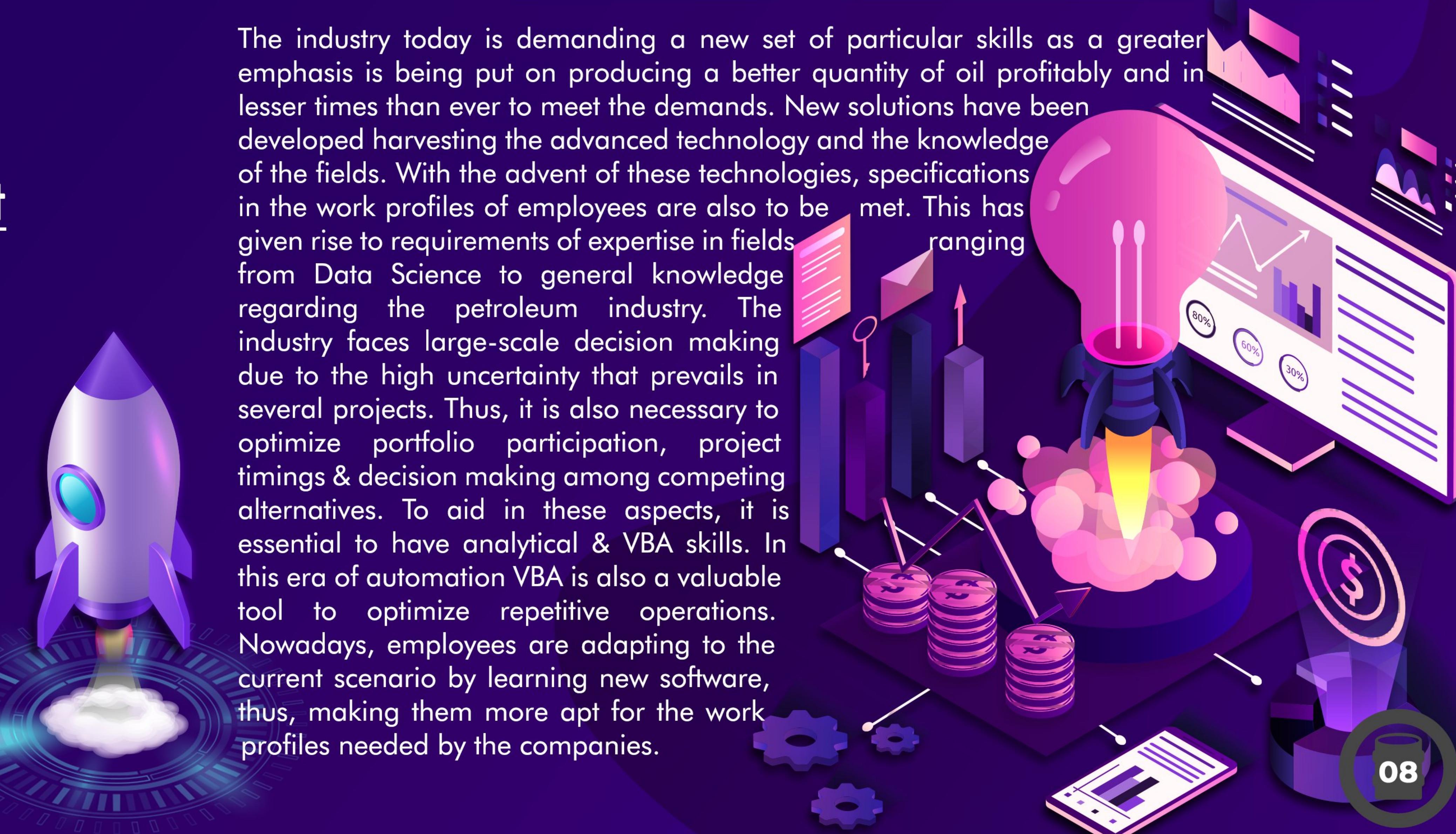
"Adaptability is the key to survival." - Be it the job profiles of the people working, or the latest trends of the modern times, the oil and gas industry demands the professionals to keep themselves updated as well as keep adapting to the sector. The companies always seek to boost productivity as well as the efficiency from the current scenarios, leading to amendments in Government oil and gas policies. The Government reviews and overhauls its policies, if found to be posing hurdles in the expansion and consumption levels to cut down unnecessary costs and eliminate time-consuming procedures all in the hope of suiting the ever-changing trends. The MOP&NG, Government of India, replaced NELP (New Exploration Licensing Policy) by a more comprehensive and versatile policy known as HELP (Hydrocarbon Exploration Licensing Policy).

## Changing Precedents

Rules are made, rules are updated. The new developments, the standards being posed in the industry have to be laid path for and, hereby the change is necessary. Modifications in regulations and guidelines are asked in the companies by departments and in the national policies by companies. Majority of the companies are putting in efforts to ensure the safety of the environment and its employees. The term "HSSE" which is an acronym for Health-Safety-Security-Environment, is gaining a lot of attention as companies are becoming focused on minimizing the contribution towards climate change.

## Modern Times, Modern Demands

The industry today is demanding a new set of particular skills as a greater emphasis is being put on producing a better quantity of oil profitably and in lesser times than ever to meet the demands. New solutions have been developed harvesting the advanced technology and the knowledge of the fields. With the advent of these technologies, specifications in the work profiles of employees are also to be met. This has given rise to requirements of expertise in fields ranging from Data Science to general knowledge regarding the petroleum industry. The industry faces large-scale decision making due to the high uncertainty that prevails in several projects. Thus, it is also necessary to optimize portfolio participation, project timings & decision making among competing alternatives. To aid in these aspects, it is essential to have analytical & VBA skills. In this era of automation VBA is also a valuable tool to optimize repetitive operations. Nowadays, employees are adapting to the current scenario by learning new software, thus, making them more apt for the work profiles needed by the companies.



# UNLOCK THE RESERVES

## Unconventionals - From Exploration to production:

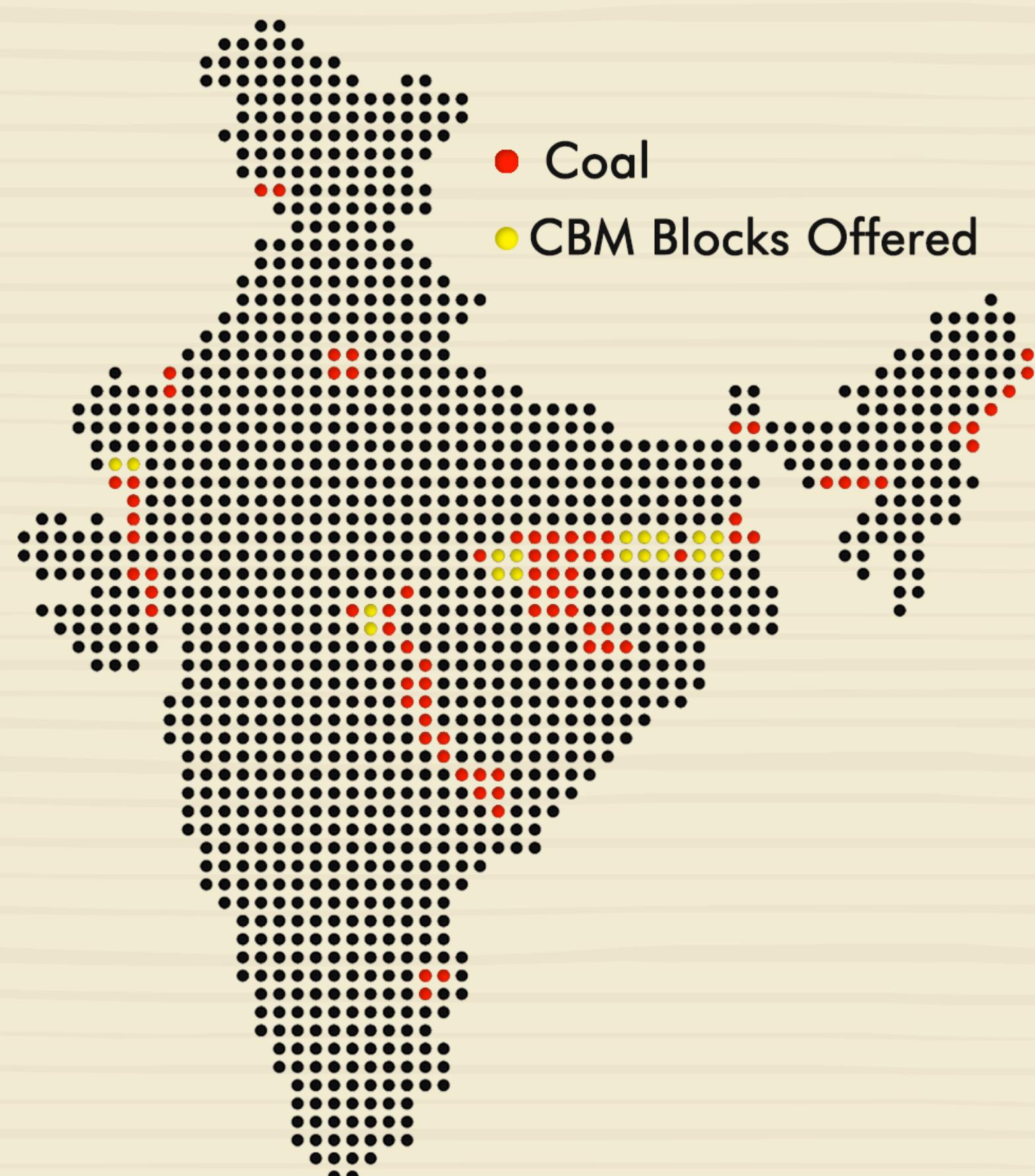
With the advent of escalating demand for energy, the unconventional resources have been identified as a potential means to satisfy our needs. In the face of a rundown of conventionals to meet energy demands, an array of new oils- oil sands, tight oil, oil shales and coal bed methane are being projected to fill the gap between demand and supply.

## Dawn of a New Era:

Over the last several decades, coal bed methane (CBM), an unconventional source of natural gas, has cropped up as an essential energy source. India, in 1992 embarked on evaluating its coal-bearing basins for their CBM potential and in 1997, tested and flowed coalbed methane for the first time which outnumbers the other sources of gas by about 65%.

India having the fifth largest proven coal reserves in the world, holds great potential for the exploitation of CBM. Current estimates of total global CBM resources are estimated to be within a range of 4000-6500 Trillion cubic feet (Tcf), of which a total of 1500 Tcf is recoverable.

The bulk of India's coal reserves and the current CBM producing blocks lie in the Gondwana sediments of Eastern India, and the potential zones being Damodar Koel valley, Son valley, Raniganj coalfield, the Parbatpur block in Jharia coalfield, and the East and West Bokaro coalfields.



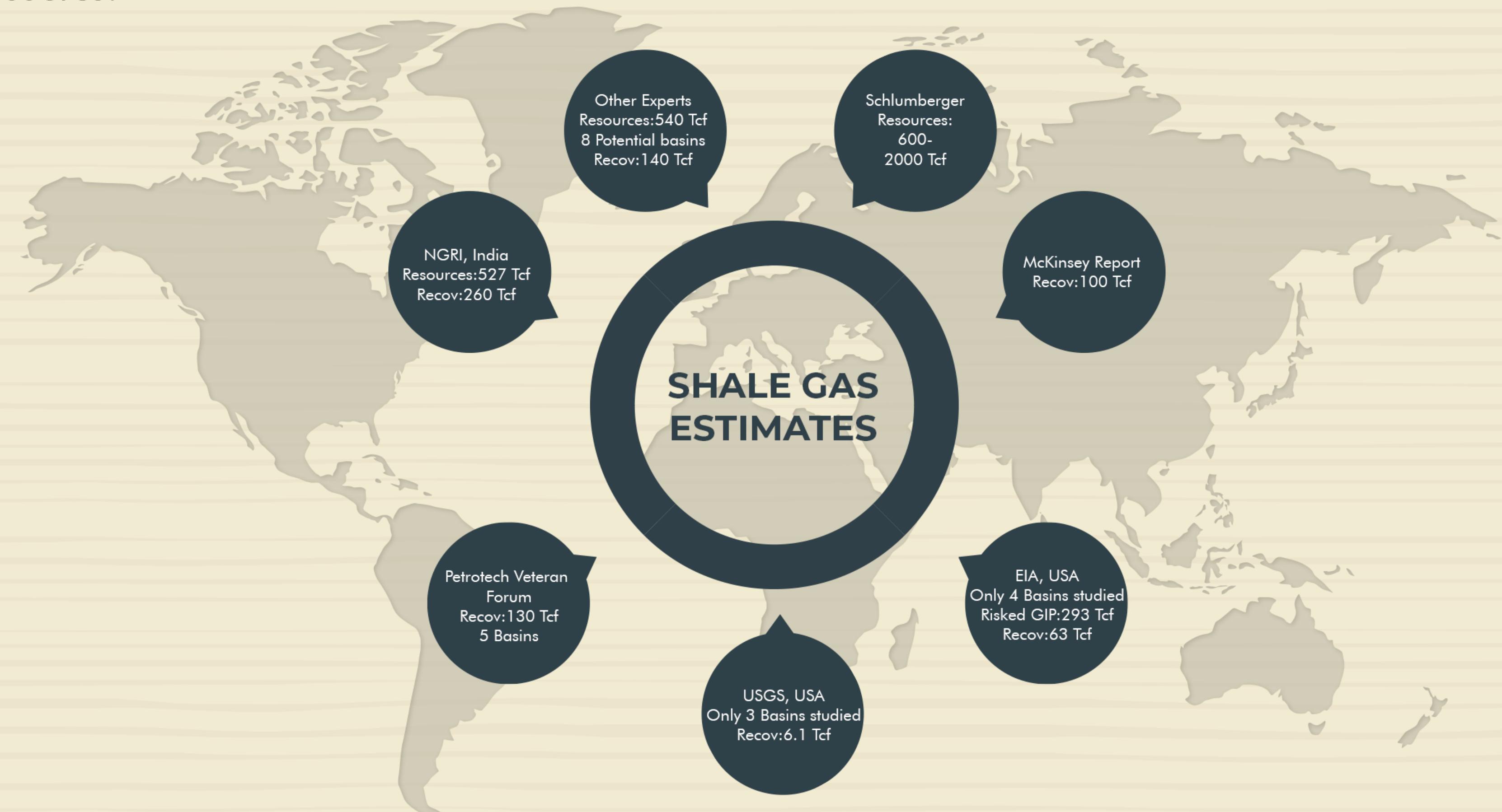
## Ushering of Potential Energy Reserves:

Pondering over the rapid rise in production of gas from shale in the US, it has increased from virtually nil production in the year 2000 to a level of 23% in 2010. It is expected to comprise nearly half of the total natural gas supply in 2035. India, the fourth largest consumer of energy, sits on as much as 96 trillion cubic feet of recoverable shale gas reserves but still stands a long way off.



## Shale- The promise for future:

As per the available data, six basins namely Cambay, Assam-Arakan, Gondwana, KG onshore, Cauvery Onshore and Indo- Gangetic basins have enormous prospects for shale gas potential. The extraction of shale gas which occurs at depths exceeding 1500 meters is done through horizontal drilling through the shale seam, followed by hydraulic fracturing of the rock. Shale gas, being a cleaner-burning fuel than coal and crude oil, emits significantly lower levels of critical pollutants including carbon dioxide, nitrogen oxide and sulfur dioxide, thus becoming a potential source.



## Shale: From Explosive to Sluggish:

The shale oil boom that catapulted the US on the road to energy independence is going bust. US oil production increased by less than 1% during the first six months of the year, down from nearly 7% growth over the same period last year. The recent OPEC+ breakdown due to negotiations for deeper output cuts in response to reduced oil demand could cause US shale oil production to decline further.

## Stumbling Blocks to Exploration:

The major environmental issues of CBM extraction like disposal of co-produced water, underground water table drawdown and methane contamination pose a hindrance to extraction. The shale gas resources in India remain untapped due to lack of technological knowledge, expensive tools and technology, lack of R&D facilities, lack of relevant data in different basins, and local environmental challenges like water management. The major problems encountered during drilling a shale gas well in India are additional reaming, hole enlargement, wellbore instability, presence of faults and sidetracking operations.

## A Window of Opportunities:

In this scenario where the global energy needs are growing and conventionals are flushing in, there is an ardent need to explore and exploit unconventional resources that can become the 'game-changer' in the energy sector by having a proper plan for redressal of challenges. The industry requires technologies & services that can reduce the extraction cost from these low permeability reservoirs. Thus, there is significant potential for passionate entrepreneurs to get their innovative minds at work and bring in some disruptive ideas which can change the future of the unconventional industry.

# B E A C O N

## Cybersecurity in Oil & Gas

"Data is the new oil. It's valuable, but if unrefined it cannot really be used." - The era of digitalization involves putting tonnes of data on the cloud. This vast data is valuable and it requires to be protected from getting stolen, corrupted or being accessed by unauthorized points. As facility automation and connectivity between networks grow, oil and gas companies are becoming more vulnerable to menaces lingering around cybersecurity.

### Why Cybersecurity?

Let's start with a glimpse of what a piece of program hard-coded by a hacker can cause by looking into what happened back with the petroleum giant Saudi Aramco. In 2012, one of the biggest cyber-attacks occurred when one of the employees of Saudi Aramco clicked on a link that was actually a virus leading to shutting down of Aramco's market for five months. Here comes the role of cybersecurity. While data breaches are due to hackers, about 80 percent of them occur because of employee negligence.

### Digital Oil Fields and Cyber Protection

Smart oil fields reduce the dependence on manual work, create direct communication and interconnectivity, and make it easier to reach remote locations by installing sensors and controllers. Most advanced smart fields make use of Intelligence Field Infrastructure (IFI).

Best technologies adopted for IFI Cyber Protection:

**Authentication and Authorization:** The IFI system depends on user IDs, passwords and configuration profiles. These include the Role-Based Access Control tool (RBACT) and Hashed Passwords.

**Firewall Technologies:** Firewall technologies play the primary role in regulating the information between devices or systems, based on predetermined authorization roles and policies.

### Advanced Ways to Deal with Data

Blockchain technology is most simply defined as a decentralized, distributed ledger that records the provenance of a digital asset. It is unique from other methods as it decentralizes the data, creates trust in the data and provides direct interaction with the data without any intermediaries.



## Personal Protective Equipment (PPE)

### A leap of Safety

OSHA has reported in 2016 that the upstream industry has one of the highest rates of severe injuries. It seems cool to dig the gold from the bottom but it's equally dangerous to face flash fires from oil wells which can reach up to 1900 degrees with other hazards including exposed Hydrogen Sulphide gas, flying particles, potentially harmful light radiation, chemicals. Such hazards harm not only eyes or face but the respiratory system too.

### Why PPE?

To help prevent workers from coming into contact with these hazards, employers provide them with personal protective equipment (PPE). On oil and gas sites, required PPE usually includes eye protection, hearing protection, hand and foot protection, and flame-resistant clothing (FRC). Many workers are also required to wear portable monitors that detect hydrogen sulfide (H<sub>2</sub>S) or other gases.

### Advanced PPE- Pushing the Limits

What if the occurrence of an accident could be predicted before it actually happened? Such a system has been developed and tested- The Human Sensory Predictive Personal Protective Equipment (PPPE) system which is founded on a plurality of machine, predictive methods, and supervisory safety alert system was developed by the e-factory (Saudi Aramco Innovation lab). This game-changing system measures human sensory central and peripheral signals, via a human-machine interface, namely, brain signals measured by electroencephalography (EEG), and biometrics (heart rate, stress response, temperature, body position, and location) measured by specialized sensors built into personal protective equipment (e.g., hard hats, safety glasses, gloves, and belts). The real-time outputs from the PPPE could produce anticipated alerts and supervisory instructions to workers and worksite personnel. This innovative system predictively determines risk and alert levels associated with worksite tasks, involving personnel, equipment in use, and the environment.

# FACULTY ACHIEVEMENTS



**Dr. Keka Ojha**  
Professor  
Petroleum Engineering

"A leader is someone who knows the way, shows the way and goes the way." Dr. Keka Ojha, the Professor of the Petroleum engineering department at IIT ISM Dhanbad genuinely exemplifies this quote. She has been applauded and recognized for her research works many times and we have mentioned some of them:

- She was felicitated with the Best Paper in Petrotech conference in 2009 held at Delhi, for her paper on "Hydraulic Fracturing".
- She also received an Excellent Paper award in Thailand in 2011 in a conference on CBMs.
- While her research works were getting applauded, she received the honor of SPE Distinguished Faculty (South Asia Pacific region) 2019 for her tremendous contribution to the teaching sector.

She has been guiding students of petroleum engineering for more than 15 years. Besides being an excellent professor and researcher, she has also served in many administrative positions. She is currently appointed as Associate Dean Academic for Undergraduates at IIT (ISM).



**Dr. Ajay Mandal**  
Professor  
Petroleum Engineering

- The Inder Mohan Thapar Foundation (IMTF) Research Award from IIT(ISM) for the year 2016-17, 17-18 and 18-19 (Jointly with Ph.D. students).
- Canara Bank Best Research Award in IIT (ISM), 2014 & 2015, 2016, 2017, 2018.

Dr. Mandal guided 12 Doctoral students and 12 students are currently pursuing their Ph.D. He was deputed to the Institute of Reservoir Studies, ONGC under the Industry-Academic interaction program for 1 year. Dr. Mandal carried out collaborative research work with the Department of Petroleum Engineering, Institute of Curtin University of Technology, under the Australia-India Joint Research Program, 2016. He also visited University Technology of Petronas, Malaysia and National University Singapore as a collaborative Research visit. Dr. Mandal is a member of ER Screening committee of the Ministry of Petroleum and Natural Gas.

Dr. Ajay Mandal is currently working as Professor & Head of the Department of Petroleum Engineering at the Indian Institute of Technology (Indian School of Mines), Dhanbad. He has made us proud numerous times with his achievements:

- Dr. Mandal is a recipient of the prestigious DAAD Fellowship of Germany in 2008.
- He has been awarded 2019 SPE Reservoir Dynamics and Description Regional Award for South Asia and Pacific region & 2015 SPE South Asia Regional Distinguished Achievement Award for Petroleum Engineering Faculty.
- IIChE (Indian Institute of Chemical Engineers) Award for the Year 2017 (ONGC Award for Excellence in Design and Development).

## NOTABLE

### SHRI NARESH VASHISHT

A dynamic entrepreneur, worthy leader, and smart investor, Shri Naresh Vashisht is a role model for all those who crave to expand their horizons and go against the flow. Shri Vashisht is the Founder and President of Omimex Resources Inc., a Texas-based Oil and Gas Company. He received his Bachelor's Degree in Petroleum Engineering from ISM Dhanbad in 1967. He was associated with a multitude of Oil and Gas Companies before embarking on the path of entrepreneurship in 1987. An outstanding philanthropist at heart, Shri Vashisht donated a massive \$1.157 million towards the construction of a Tinkering and Innovation Lab at IIT(ISM) aimed at substantially improving the research output of the Institute. He helps those in need through his charitable trust, the Naresh Vashisht Foundation.

### SHRI ANOOP PODDAR

An alumnus of the batch of 1994 of the Department of Petroleum Engineering, Mr. Anoop Poddar, has experiences ranging far and wide in the Oil and Gas Industry. Currently, he is the Senior Partner and President of EV Private Equity, an independent growth equity firm that strives to improve the industry by incorporating the latest technology and techniques. He is the former CEO and one of the founding members of the private equity firm First Reserve Momentum. He has also served as a corporate financial advisor at Simmons and Company and was associated with giants like Schlumberger and Essar Oil under various technical roles.

### DR. AKHIL DATTA GUPTA

Prof. Akhil Datta-Gupta is Regents Professor and holder of L. F. Peterson '36 Endowed Chair in Petroleum Engineering at Texas A&M University. An alumnus of the batch of 1980, his contributions to the field of Streamline Simulation in petroleum reservoir characterization and the management and calibration of high-resolution geologic models has been unparalleled. Recognized as an SPE Distinguished Member, his achievements include the 2009 John Franklin Carll Award from SPE, the 2003 SPE Lester C. Uren Award, and two SPE Cedric K. Ferguson Certificates for the best peer-approved paper in 2000 and 2006. Moreover, he was awarded the AIIME Rossiter W. Raymond Award and elected to the prestigious U.S. National Academy of Engineering. His contribution to the growth and development of industry has been unfathomable.

### DR. MIHIR K. SINHA

Dr. Mihir K. Sinha has experiences ranging far and wide in the Oil and Gas Industry as well as the Financial Markets. He received his B.S. degree in Petroleum Engineering from ISM in 1966 and has over 50 years of experience in the Oil and Gas Industry, teaching, international commercial and investment banking as well as financial consulting. Dr. Sinha started his career as an assistant driller in ONGC and then went on to work for several companies like Texaco Inc, Northwest Energy Company and Rocky Mountain Petroleum Consultants. He went on to become the vice president of J.P. Morgan and Co. and later founded iftc LLC, an independent financial advisory company, specializing in energy finance, in 2002. He has authored numerous technical publications and is a member of the Society of Petroleum Engineers, the National Association of Petroleum Investment Analysts, and the New York Oil and Gas Group.

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### Panjwani Ekta Hareesh (ExxonMobil)



ExxonMobil

I got a Pre-placement offer from ExxonMobil as a Reservoir Engineer. My interview was quite different as Interviewers came with a space of knowing you as a person. At times, they would ensure that I am comfortable, and their interest in the process was fascinating. My 10-week intern experience made my desire to work for the company stronger. Collaborating in this dynamic environment provides new challenges every day and promotes the development of ongoing skills and personal growth. It's a great place to work; we carry out compelling projects alongside counterparts from around the world. EM cares about its employees and believes in work-life balance. You'll have opportunities to explore your interests, grow personally as well as professionally, and develop fundamental career-building skills.

I would recommend my juniors to work hard and be confident. Start focusing on soft skills along with technical skills, as both are important in professional life.

### Vamsi Krishna (Reliance)



Reliance

Though my intern at Cairn Indian LTD didn't get me a PPO in the first list, I didn't lose hope and did best at gaining knowledge. I expected to secure a job in one of the leading O&G companies. I got selected as a Production Engineer for Reliance Industries LTD.

Reliance procedure of recruitment includes CV and GPA shortlisting. Students clearing all the required criteria are selected for written test round that concentrates on questions from "well tests and logging." PI is based on the information in CV, your projects, and your role in it. Good knowledge of the trends in the industry is a must.

One should wait until a company matching his profile comes. Don't rush into things; maintain a GPA above average to have a good chance in all companies.

I got placed as a Software Development Engineer in Toppr. A startup like Toppr can provide excellent learning and work environment, thus a good start to the career. The interview comprises of Technical round (CV based), and HR rounds based on logical thinking and general interests. "Why chose SDE profile when Petroleum Engineering isn't related to it?" is a primary question faced during the Interviews. I think the JEE rank can decide your Branch and Institute, but you can determine your interest and career.

I always focus on exploring and learning new technologies to enhance my knowledge. An SDE profile requires proper competitive coding along with Algorithms and Data Structures, OOPs, OS, and DBMS. CV plays an important role, make it short and precise, and it must be your strength. For technical profiles, soft skills aren't the most important criteria. Still, it is advisable to maintain the right balance between soft and technical skills.

### Tarun Kumar (Toppr)



toppr

### Ambuj Kumar (ONGC)

ओएनजीसी  
ONGC

Since ONGC is the country's largest crude oil and natural gas company in India, it gives me immense pleasure to state with pride that I'm going to be a part of the ONGC family as an AEE (Production). I believe ONGC would provide me with a conducive, competitive, and healthy environment to grow professionally.

I began longing for being an ONGCian right from my pre-final year. Upon the culmination of my research work in Canada, I started honing my technical as well as communication skills. For the technical portion, I referred to some standard recommended books. I improved my soft skills by engaging in the bunch of activities of the SPE IIT (ISM) Student chapter. ONGC Selection strategy comprises of CV shortlisting and Interview round. In the interview round, they demonstrate knowledge and gauge one's potential effectively and efficiently. Our industry is experiencing changes, so grab opportunities, get furnished with new knowledge and skills, and Always Believe in Yourself.

### Harshit Garg (Cairn India)



CAIRN

"Oil & Gas industry is a manifold of almost all the industries in the world offering a variety of roles in almost all the engineering disciplines."

I always had an inclination towards E&P companies. Bagging an internship in India's largest independent O&G producer was nothing less than a dream. The work environment at Cairn is exceptionally admirable, people are helpful and friendly and it offers a challenging platform to develop yourself from a student to a professional. Undeniably, soft skills play a crucial role in corporates and they often look for qualities like leadership and teamwork in the individual. Networking surely plays a handy role in our industry. I was on cloud nine when I learned about receiving a PPO from Cairn, an offer to continue as a Graduate Engineer Trainee. Now, my prime objective is to build a strong technical foundation and grow with the company as a technical leader.

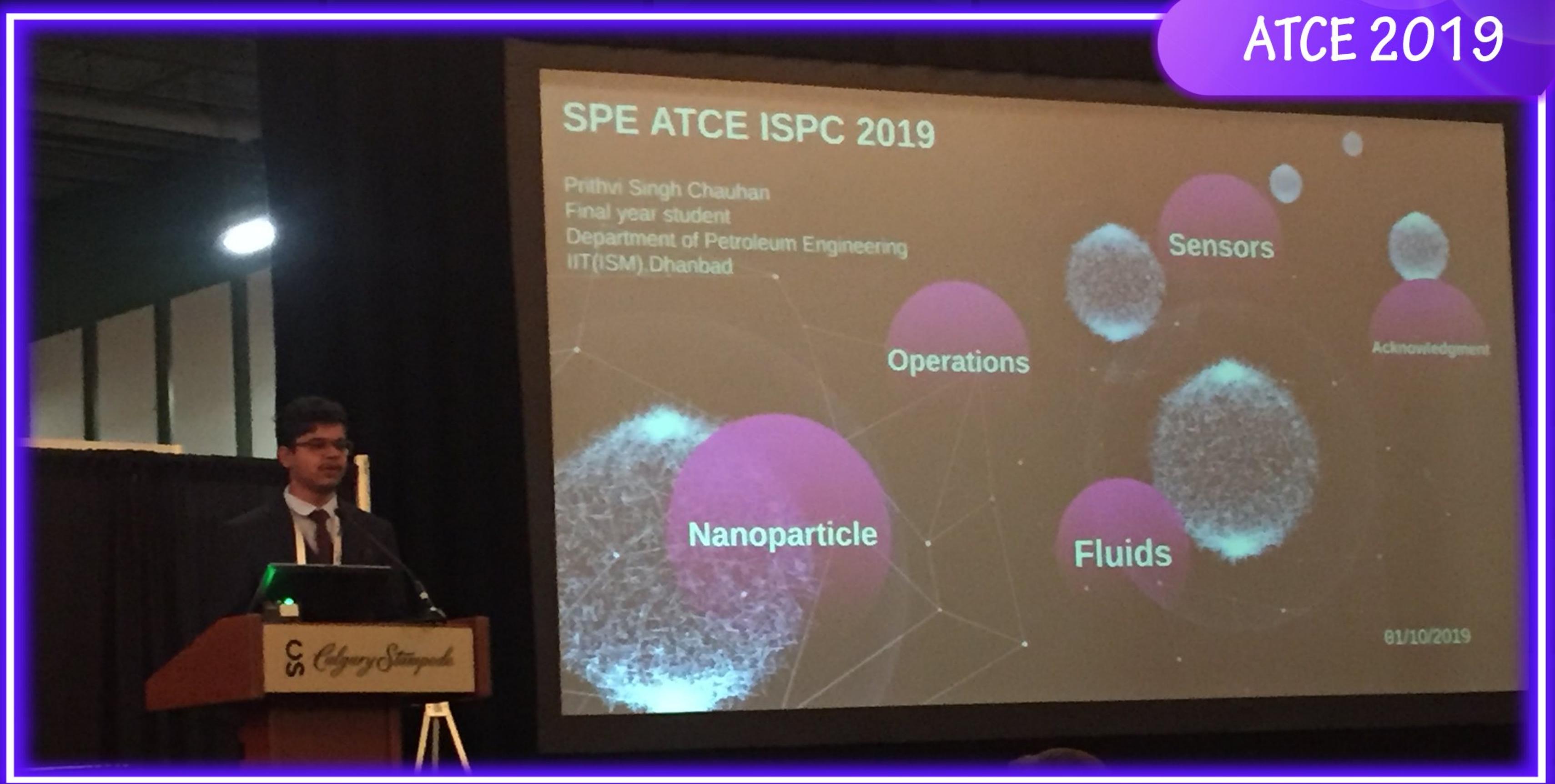
I had plans to go for E&P companies. However, down the line, as Market Scenario and Company policies changed, I decided to choose a more stable option. I got placed as Area Business Manager for Poncho Hospitality Pvt.Ltd, also known as Box8, a FoodTech startup based out of Mumbai. Box8's placement procedure consists of 3 stages, CV Shortlisting round, Written Test round having general aptitude questions, and data interpretation sets. Interview rounds are based on brainstorming guesstimates, event management abilities, and real-life decision-making capabilities. Being at the top decision-makers of the company, I'm looking forward to building myself as more versatile and strategically more potent personnel. I believe it's your knowledge and extracurriculars that matter over your past number of internships when it comes to placements. Being a part of the dynamic and competitive industry is always a risk, so be flexible in exploring your options, and don't be in the comfort zone at any point in time.

### Sanskar Jain (BOX8)



BOX8

## ATCE 2019



SPE ATCE 2019 was held at Calgary, Canada, from 30th September to 2nd October 2019. Mr. Prithvi Singh Chauhan, a final-year student, represented SPE IIT (ISM) Student Chapter there. It was an honor for him to attend SPE ATCE 2019 as the South Asia regional qualifier after winning SPE RSPC South Asia 2019. He presented and competed with his research paper on the "Application of nanoparticles in the oil and gas industry" with 9 other regional participants from all around the world. As one of the junior-most aspiring petroleum engineers, he met top leaders of the energy industry from Shell, Saudi Aramco, Devon, Exxon. With representatives of various backgrounds which include from academic to chair level personalities. Having diversity in terms of industry, research, and background it was an interaction and exposure that is much needed in today's world to bring down the industry and academia gap. Observing the most nocturnal technology and recognizing the need for the industry as a student is something everyone should be exposed to.

## Closing Session



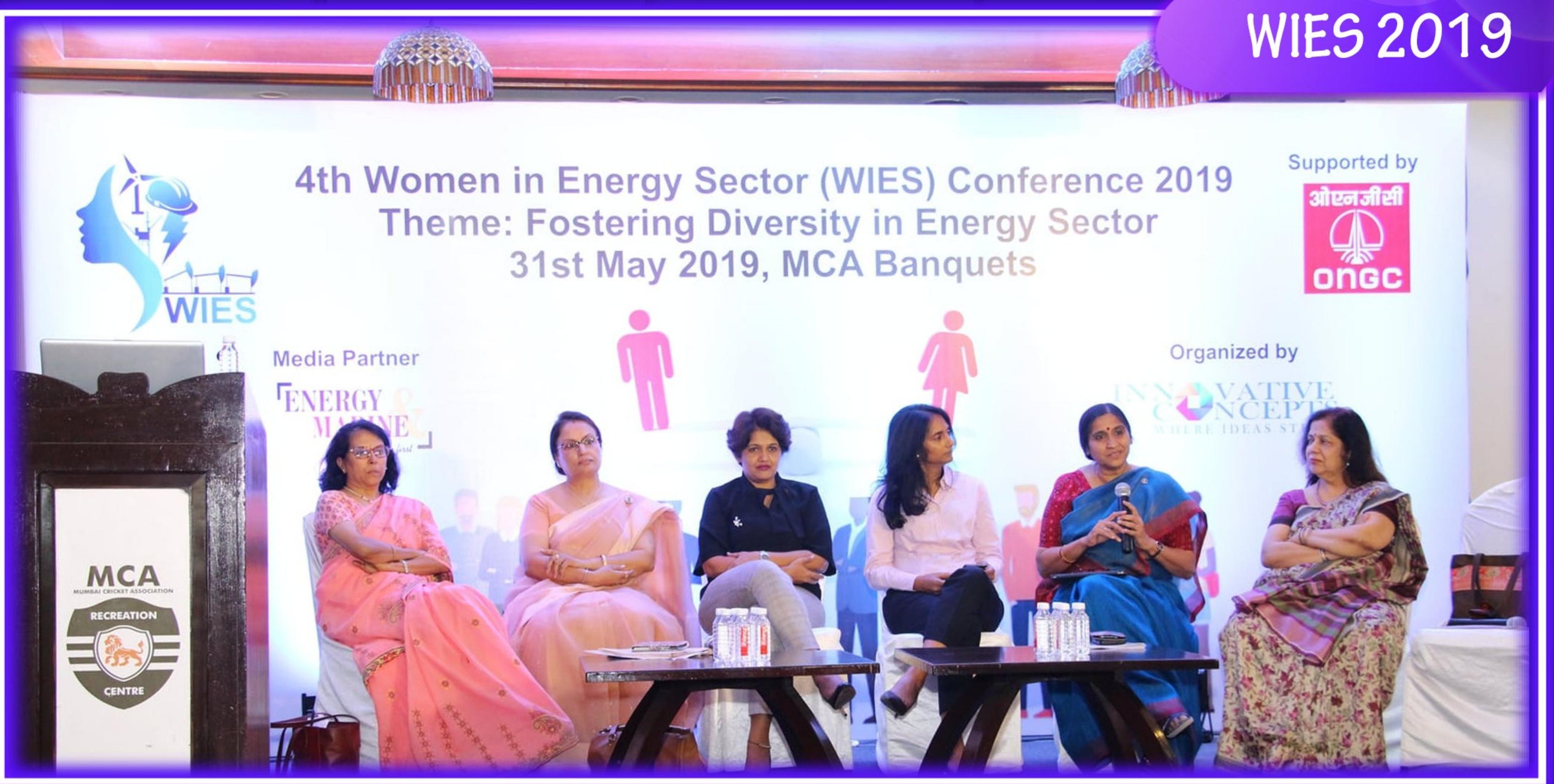
IPTC is one of the largest oil & gas conferences conducted from 13th -15th January 2020 at Dhahran, Kingdom of Saudi Arabia. IPTC is sponsored by all the 4 major societies i.e. SPE, AAPG, SEG & EAGE which in itself speaks of its grandeur. Our chapter was represented by our member Mr. Debosmit Banerjee, a third-year student. He was one of the 100 best students from all over the world to be selected for the IPTC 2020 Education Week. There he got an excellent opportunity to network with professionals from Saudi Aramco, Schlumberger, Baker Hughes, Halliburton, Sinopec. He made us proud by securing the 1st position out of 20 teams in Schlumberger's case study "Unlock the Reserves" which involved interpretation of well log data to develop a reservoir model using Petrel & designing surface facilities to maximize Net Present Value (NPV). His team also secured 3rd position in a Scavenger Hunt. He was felicitated at the closing ceremony by the Chairman of IPTC 2020.

## IDEC 2019



India Drilling & Exploration Conference (IDEC), the flagship event of Innovative Concepts, is one of the leading regional events dedicated to exploring the potential of offshore & onshore oil & gas sectors in India. IDEC 2019 was held in Mumbai from 6 to 7 June 2019. Stimulating panel discussions and well researched technical poster presentations were an integral part of IDEC 2019. The conference hosted professionals from companies like ONGC, OIL, Schlumberger, Bentec, Baker Hughes and many more as its delegates and speakers. IIT (ISM) Student Chapter sent a contingent of 9 students to IDEC 2019. While some of our students set up a stall at IDEC, showcasing our magazines and other activities under SPE IIT (ISM) SC, some were engaged in the registration desk. A poster was also presented by our Chapter in an open non-competitive platform. In a nutshell, IDEC 2019 provided the attendees the much needed exposure to corporate insights and invaluable networking opportunities within the oil & gas fraternity.

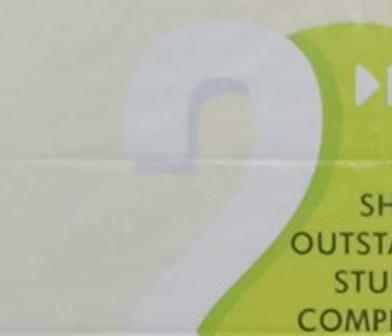
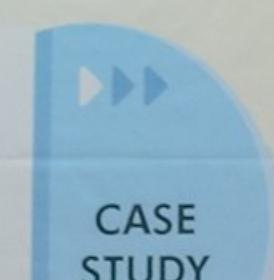
## WIES 2019



Women in Energy Sector (WIES), founded in 2016, is a voluntary group of professionals working together in the energy sector for encouraging involvement of both women and men at all levels of leadership to promote diversity & inclusion at work places. The fourth edition of WIES Conference took place in Mumbai on 31 May 2019, with the theme- Fostering Diversity in the Energy Sector. 4 students from SPE IIT (ISM) Student Chapter represented our institute at WIES Conference 2019. The conference offered a plethora of guest talks from highly successful women in the Energy Sector who shared their inspiring stories with all. Professionals from companies like ONGC, BP and Schlumberger, and professors from various renowned universities across the globe were present as delegates. Our members received an extensive opportunity of networking and interacting with the panelists and delegates. The event concluded with an award ceremony to recognize & reward excellencies, distinguished individuals, enterprises, corporations and government agencies that have thrived to promote and achieve WIES' fundamental goal.



SPE IIT (ISM)

SPE IIT (ISM) Student Chapter  
PRESENTSSPE  
International Petroleum Students  
Engineering & Technology  
Society of Petroleum Engineers

20

CASE STUDY

STUDY

COMPETITION

SHELL  
OUTSTANDING  
STUDENT  
COMPETITIONCASE  
STUDY

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SHELL  
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COMPETITION

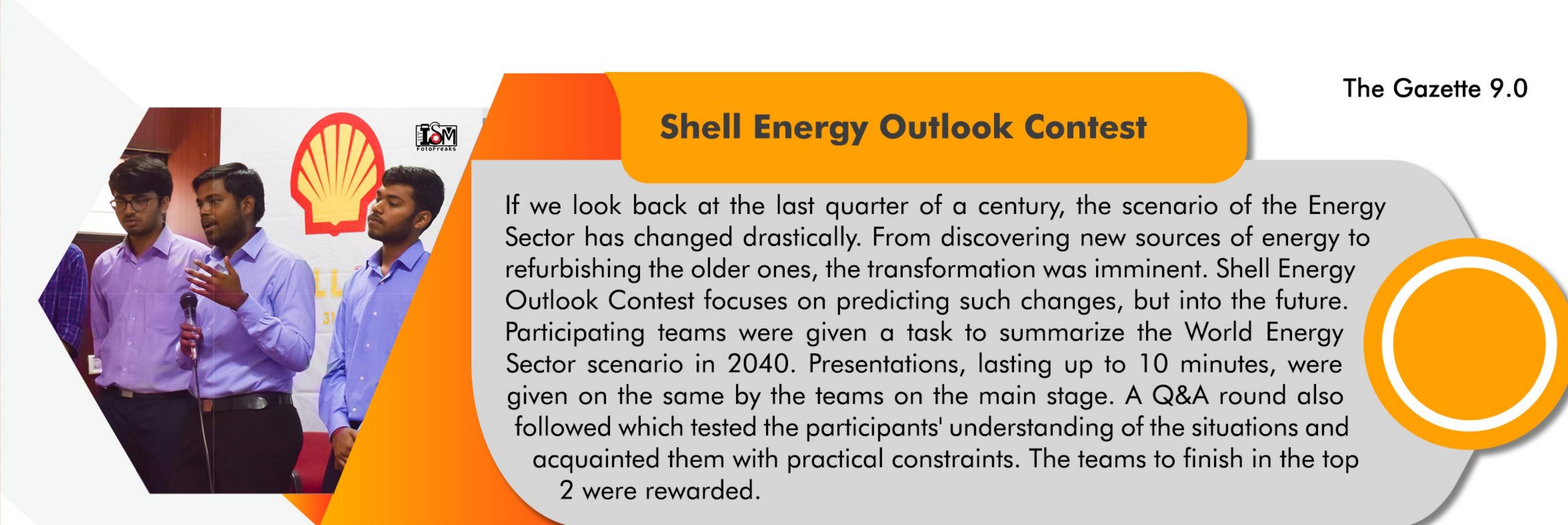
CASE  
STUDY

STUDY

COMPETITION

# SHELL DAY '19

**S**hell Day 2019, the most awaited professional event of 2019 that provided an ideal platform to highlight and develop interpersonal skills along with the critical thinking ability of the students, was organized by SPE IIT (ISM) SC on 31st March 2019 at the Management Hall. On spot prizes with a total worth of Rs 45000 were provided to the winners. The event marked its beginning with the tagline, "Because the best company needs the best you", followed by a lamp lighting ceremony. Mr. Debjit Ghosh, Mrs. Aastha Sharma and Miss Vasundhara Sarkar from Shell, and our respected director, Prof. Rajiv Shekhar, were invited to the event. Shell Day 2019 consisted of exciting events like HSSE Photography, Case Study, Shell Outstanding Student Competition and Shell Energy Outlook. Overall, the participants enhanced their presentation and communication skills and technical knowledge and learned what they need to inculcate into themselves to be a part of the E&P industry. The event witnessed healthy participation and a fairly interactive audience. The day surely lived up to its expectations with talented minds and great ideas ruling it. To add to its grandeur, Shell Day 2019 was also joined by Mr. Siddhartha Sur, Ex-Director of IRS (ONGC), as an invited delegate. The praisings earned by the participants from the invited delegates stood as a testimony to their excellence. Lastly "Gazette 8.0", the annual magazine of SPE IIT(ISM) Student Chapter, was launched successfully with the theme "Anchoring Code to Crude". In a nutshell, Shell Day 2019 served as an excellent platform to enhance technical understanding and industrial networks.



## Shell Energy Outlook Contest

If we look back at the last quarter of a century, the scenario of the Energy Sector has changed drastically. From discovering new sources of energy to refurbishing the older ones, the transformation was imminent. Shell Energy Outlook Contest focuses on predicting such changes, but into the future. Participating teams were given a task to summarize the World Energy Sector scenario in 2040. Presentations, lasting up to 10 minutes, were given on the same by the teams on the main stage. A Q&A round also followed which tested the participants' understanding of the situations and acquainted them with practical constraints. The teams to finish in the top 2 were rewarded.

## HSSE Photography and Videography Competition

HSSE is an extremely important aspect for any industry. Standing in the 21st century, it is an ardent need to look at the environmental hazards thrown by the industry, and the safety of working conditions comes into consideration without saying. The threat to HSSE exists in disguise. The motive of this competition was to capture such threats and provide inquisitive approaches to minimize or prevent them. The participants were given 5 minutes to explain their captured photographs or videos. The top three participants were rewarded.

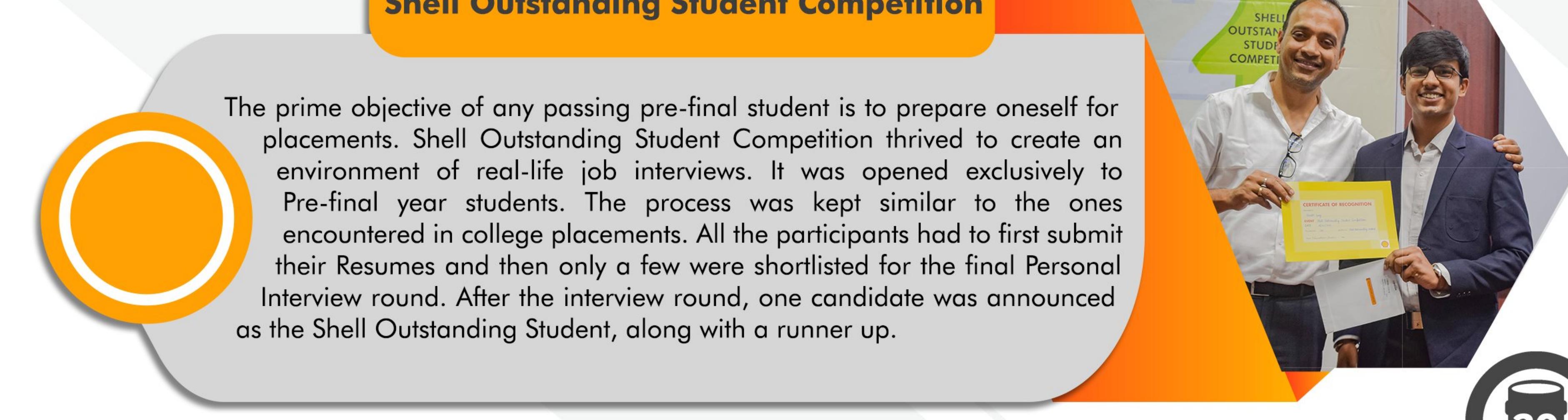


## Case Study



As suggested by the name, Case Study involved providing innovative and efficient solutions to a problem statement given to its participants. To add a bit of fun to it, the theme for the case study was kept as Game of Thrones and a map from the web series was also included in the given problem statement. The problem statement was provided two weeks prior to the competition. The participants came in teams of 3 to 4 and presented their unique approaches to the judges. Prizes were given away to the top three teams.

## Shell Outstanding Student Competition



The prime objective of any passing pre-final student is to prepare oneself for placements. Shell Outstanding Student Competition thrived to create an environment of real-life job interviews. It was opened exclusively to Pre-final year students. The process was kept similar to the ones encountered in college placements. All the participants had to first submit their Resumes and then only a few were shortlisted for the final Personal Interview round. After the interview round, one candidate was announced as the Shell Outstanding Student, along with a runner up.

# SPE ACTIVITIES 2019-20



## 1 Induction Programme

The induction program was organized by SPE IIT (ISM) Student Chapter on 5 November 2019. It was aimed to acquaint the freshmen with the fundamentals of the O&G industry and to brief them about the working and long-term objectives of our chapter. The Chief Guest for the event, Shri Siddhartha Sur, honored the winners of "Blueprint."

## 2 Intern Talk

Intern talk, an annually held event on intern opportunities for 2nd and 3rd-year students, was organized by the chapter with the purpose of briefing the students with comprehensive and precise knowledge about the current internship scenario.



## 3 Teacher's Day Celebration

On the auspicious occasion of Teacher's Day, the chapter conducted a celebratory ceremony to extend its sincere respect and gratitude towards our heroic faculty. Few cultural acts were also performed. Mentors motivated the students to excel in their field and secure a bright future.



## 4 Basant

The alumni meet 'Basant' was graced by the presence of our alumni from the 1960 & 1970 batches. An interactive session was organized where the students got a golden opportunity to hear from experienced professionals. A stall was set-up to inform the alumni about the activities & achievements of our Student Chapter.

## 5 Workshops

Various workshops were conducted by renowned dignitaries of the petroleum industry under the banner of the chapter. Topics pertaining to multifarious avenues were touched that incorporated the knowledge to be imparted to the future engineers at an early stage, for instance, the impact of Data Science on Oil and Gas Industry, Reservoir Black Oil Simulation, SPE e-mentoring, etc. The motto was to make the students aware of the current scenario and the challenges faced in the concerned sector in order to shape the future prospects for the overall betterment of the industry.



## 6 Competitive events

To foster the desire to succeed and maintain the competitiveness among students, the chapter conducted the events "Blueprint" and "Energy Revolution 2040". These events turned out to be a good learning curve for the participants in which they showcased their talent and skills and gained first-hand experience and knowledge related to the industry simultaneously.

## 7 Guest lectures

Numerous guest lectures and interactive sessions were conducted by the chapter throughout the year. Delegates from diversified fields including Dr. Anil Kumar, President and CEO, Omak Technologies LLC, Texas, USA, Shri O.N. Gyani, GGM and Head IRS, ONGC Ahmedabad and other renowned dignitaries of Oil and Gas sector hosted the sessions and made the students aware of the present scenario of oil and gas industry and resolved their queries about various facets pertaining to it. These lectures motivated the students to be self-sufficient and encouraged them to compete with their contemporaries.



# SPE cares

## Clothes Drive

In this contemporary world, where technology and internet access seem increasingly ubiquitous, a "digital divide" between the elite class and the socially backward classes is distinct. SPE care aims to fill this gap and strives for improvement on social grounds. Driven by this such zeal, SPE IIT (ISM) Student Chapter carried a Clothes Donation Drive among the campus hostels and distributed the collected clothes, after getting them washed and cleaned, to the deprived ones from the suburbs of Dhanbad to keep them comfortable in harsh summers and winters.

## Plantation Drive

Environmental issues have been on the political radar for over 50 years now. With the current developments not any more promising than they were decades ago, it's time to step up and bring a change. "Climate change is not a lie, and we won't let our planet die!" Building on this, a plantation drive was organized under the banner of our chapter. With the zeal to escalate awareness about the green cover on our planet, the drive saw an active participation of many students, faculty members and staff with utmost enthusiasm.

The Chapter aims to bring a positive change in society and contribute in raising the standard of living of the underprivileged. We always work for the SPE international motto  
**"Care and Nourish, Help and Rise."**

## Anti COVID-19 Soap Distribution

With the World Health Organization declaring the coronavirus a global pandemic, initiatives were taken by our chapter to spread awareness and to aid the underprivileged masses to combat COVID-19 and its implications. With this vision, soaps were distributed to the ones denied from basic amenities due to pauperism. They were also delivered a speech regarding the same by our student members. The chapter also posted "Do's and Don'ts" issued by the Government of India to disseminate knowledge concerning the virus to the general public.

## Blood Donation

Blood donation is a significant concern to the society as donated blood is lifesaving for individuals who need it. Blood is scarce. There is a shortage of active blood donors to meet the need for increased blood demand. "A single pint can save three lives, and a single gesture can create a million smiles." With this initiative, the chapter conducted Blood donation camps to meet the increasing blood demand, and to create awareness and opportunities for blood donation in and around the city of Dhanbad.



# SPE GALLERY



# OUR TEAM



*Debosmit Banerjee*  
EDITOR-IN-CHIEF



*Aritra Roy*  
CHAPTER OFFICER



*Pradyumn*  
ADVISOR

*Abhilash Panging*  
DESIGNER-IN-CHIEF



*Kshitij Goyal*  
HEAD CHAPTER DESIGNER

# CONTENT TEAM



Anindya



Shubham



Shamita



Saransh



Arya



Hardik



Rajvardhan



Preet



Dedipya



Somya

# DESIGNING TEAM



Vedansh



Sarthak



Pratik