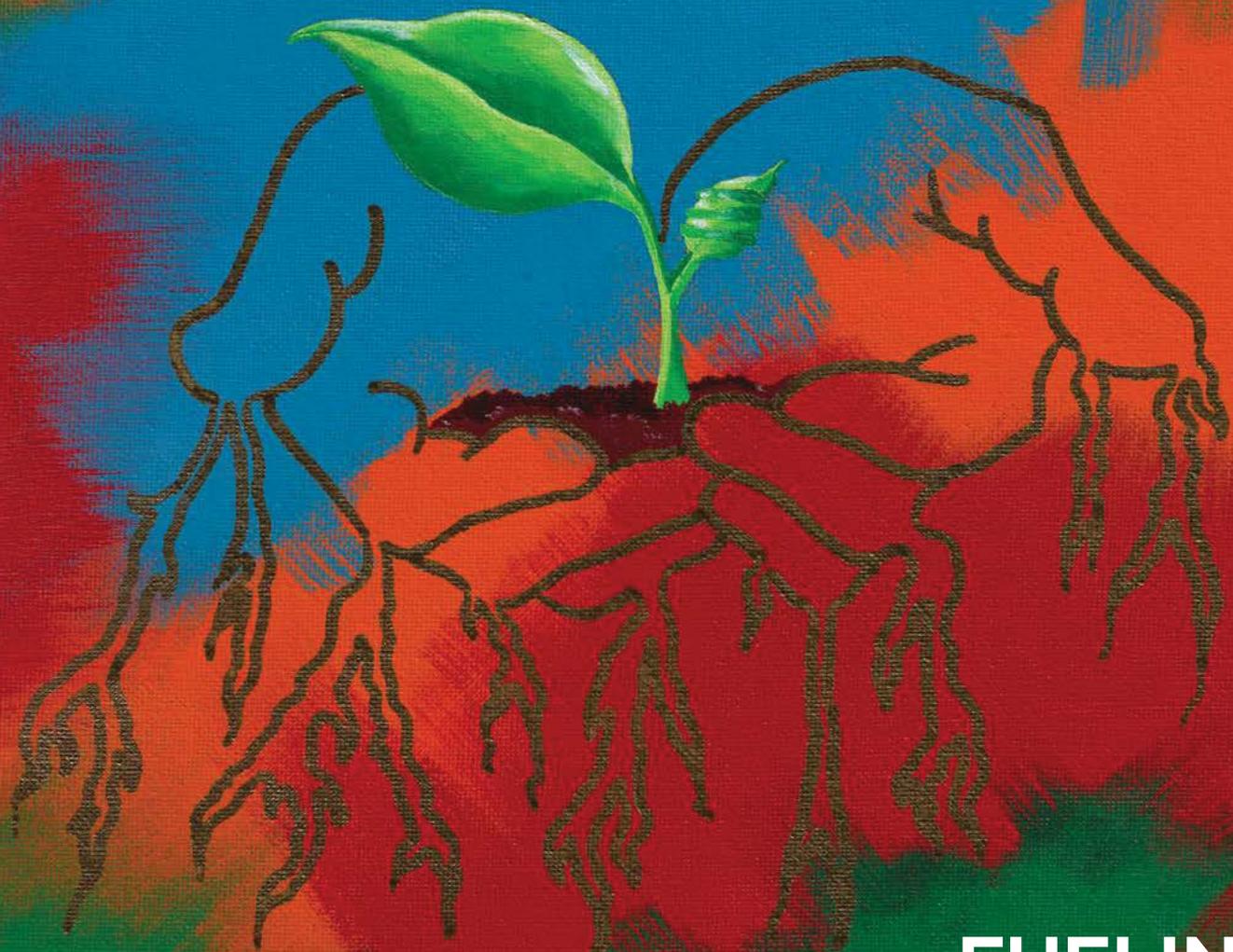




November 2019  
**SandRose**  
Magazine



Kingdom of Saudi Arabia Section

*Fahma Alshikh*

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EXCLUSIVE HOST

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saudi aramco



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*IPTC 2020 Executive Committee Chair*



EVENT MANAGEMENT AND  
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# CONTRIBUTORS

## OCTOBER/NOVEMBER, 2019 EDITION

**EDITOR IN CHIEF**  
Hala AlHashmi

**EDITORIAL ADVISOR**  
Salma Al-Hashimi

**CREATIVE ADVISOR**  
Anas Ruhman

**ASSISTANT EDITOR**  
Sarah Alruwaily

**SENIOR EDITORS**  
Ammar Siddiqui  
Fatemah Abudeeb  
Ali Altowilib

**ASSOCIATE EDITORS**  
Yazeed AlDughaiter  
Hala Alwagdani  
Reem Alsadoun  
Syed Haider

**CONTRIBUTORS**  
Ahmad Ismail  
Maha AlHashmi  
Nouf Alotaibi  
Mohamed Alsomali  
Abdulhadi Albokhari  
Khaled Al Mansour

**GRAPHIC DESIGNER**  
Sara Sami

 [behance.com/sarasami](https://www.behance.com/sarasami)

**COVER DESIGN ARTIST**  
Rahma Abdulal

 [balililah](https://www.instagram.com/balililah)

 [balilahart@gmail.com](mailto:balilahart@gmail.com)



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# MESSAGE FROM THE EDITOR-IN-CHIEF

It is with utmost excitement that I present to you the second edition of SandRose Magazine for the term 2019-2020. It gives me great pride to see that, in the past couple of months, SPE-KSA has done many great services to the community. And because of this pattern of community service, the theme of SandRose stood out to us like a rose among thorns: Community.

The Technical Programs team successfully held two professional events at which valuable technical and non-technical information was shared. The Trips & Social Activities team served the community through various events and campaigns. The Student Outreach Team reached hundreds of students and youngsters through their community events and academic visits. Additionally, the Memberships team launched their Loyalty Program which benefits SPE-KSA members all over the Kingdom. Last but definitely not least, the IT team has been working tirelessly to revamp SPE-KSA's website and mobile application in order to best-serve our members. All of the above is done passionately and voluntarily in an effort to serve our community.

In this edition, you will also find an insightful article provided to us by our valuable sponsor for this edition, Halliburton. We also have a special feature that highlights Dr. Sami Alnuaim's speech in ATCE and celebrates the winners of the 2019 SPE Awards. You'll also find a special highlight by team Estidamah on their participation the Solar Car Race, held in Australia. In addition, you will find articles on Machine Learning, Employee Engagement and Disabilities. And to further benefit our readers in a practical manner, we have two new sections: "Useful Resources" and "Recommended Reads by SPE Leaders".

This edition also heavily utilizes the Augmented Reality feature, an interactive feature that allows you to catch a glimpse of our events through the SPE-KSA application. Also, in an effort to make the articles easily shareable, the QR codes found at the end of each article take you straight to the online version and allow you to easily share the articles and features of this publication.

I would like to offer my sincerest gratitude to all the contributors to this edition. The SandRose team, as per usual, has gone above and beyond in their efforts in content-creation, design and editing. A special thank you goes to esteemed leaders of the SPE community, who took valuable time to share their messages, favorite books and useful reads.

At SPE-KSA and SandRose Magazine, our #1 goal will always be to "fuel our community", and we encourage you to join us in achieving this goal. We guarantee you that there's nothing more rewarding than doing deeds that have a real impact on the community.

**HALA A. ALHASHMI**  
Editor-in-Chief



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# MEET THE SANDROSE TEAM



**Salma Al-Hashimi**  
Chief Editor Advisor



**Anas Ruhman**  
Creative Advisor



**Sarah Alruwaily**  
Assistant Editor



**Ammar Siddiqui**  
Senior Editor



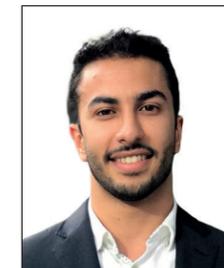
**Fatemah Abudeeb**  
Senior Editor



**Ali Al Towilib**  
Senior Editor



**Yazeed Al Dughaither**  
Associate Editor



**Khalid Butairi**  
Associate Editor



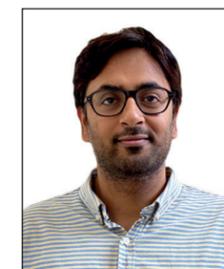
**Norah Al Sunaidi**  
Associate Editor



**Reem Alsadoun**  
Associate Editor



**Hala Alwagdani**  
Associate Editor



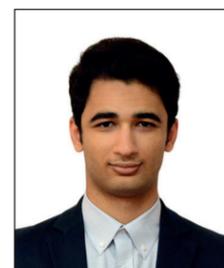
**Syed Haider**  
Associate Editor



**Malika Sharif**  
Contributor



**Maha AlHashmi**  
Contributor



**Ahmad Ismail**  
Contributor



**Nouf Alotaibi**  
Contributor



**Noora Al-Hashimi**  
Contributor

# MESSAGE FROM THE CHAIRMAN

## Our Section's Diversity is Our True Strength

SPE-KSA has witnessed successes after successes throughout the years. In fact, in every term, the section's boards would think that we have attained a level that cannot be surpassed; yet, we always manage to indisputably exceed all expectations, become more ambitious and raise the bar even higher. Despite the challenges that arise on our way to success, breakthroughs and positive results are always what shine through. The world's dynamic changes resulted in a more complex environment and new challenges. Anyone would agree that such challenges are challenges that can only be tackled by having a great team. And this is what we have. But honestly, what is our secret? What makes SPE-KSA strong, agile, successful and recognizable? To make a long story short, it is the team's diversity.

Well, of course it is. SPE-KSA brings together members and volunteers from different companies, disciplines, genders, cultures and experiences. These members, with their different interests, priorities and strengths, come together for one, grand purpose: Work hand-in-hand nobly, enthusiastically and voluntarily to support our society in its elevation and serve the public good. Our diversity, along with the amount and quality of activities, events and programs, placed us as a leading section in the world and the Kingdom.

What diversity really brings is that it promotes a broader range of task-relevant knowledge, skills, experiences, abilities, understanding, confidence and, more importantly, encourages individual contributions and fills gaps that have gone unnoticed. Consequently, this does not only develop and improve the section, but it also plays a pivotal role in the advancement of our members and volunteers both technically and professionally. Accordingly, it equips our members with the right tools and arms them against the vigorous and rapid changes that we are currently witnessing in our industry and that are anticipated to continue and grow in the future.

And therefore, I highly encourage our members and readers to volunteer with us and support the genuine mission and objectives of our great society and our proud section.

**ABDULAZIZ K. AL SUFAYAN**  
Chairman, SPE-KSA



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# SPE-KSA 2019-2020 EXECUTIVE BOARD



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## JOIN SPE-KSA FAMILY NOW!

SPE-KSA section is considered one of the largest and most decorated SPE sections in the world with more than 10,500 members.

For more information about how to join SPE-KSA family, visit [spe-ksa.org/membership/](https://spe-ksa.org/membership/)

# VOLUNTEER OF THE YEAR

## SPE-KSA 2018-2019 TERM

My journey with SPE-KSA started in 2016 when I was invited as a guest speaker for the 2016 SPE-KSA Young Professionals Technical Symposium (YPTS) as part of my role in the Saudi Aramco Young Leaders Advisory Board.

As a professional in the healthcare sector, I was intrigued by the level of professionalism, commitment and perseverance seen in the section's volunteers, and was keen on joining and contributing to the section's mission and adding value to an industry that is significantly impactful in this Kingdom.

Ever since I joined SPE-KSA, I have been heavily involved in various events and symposiums throughout most of SPE-KSA's committees. I have taken part in the 2017 & 2018 YPTS as part of the Young Professionals Committee, the 2018 ATS&E Committee as a team leader, have also been a part of the Technical Programs Committee providing help with logistics and the Trips and Social Activities Committee coordinating social initiatives and trips.

By the end of the 2018-2019 term, I received the honor of being awarded as Volunteer of the Year, which came as a very delightful surprise by the section I truly cherish and enjoy volunteering with. Being considered for this award by the SPE-KSA Executive Board was an absolute pleasure and honor. I am thankful for the amazing volunteers whom without their inspirational dedication, teamwork and effort, this milestone would not have been possible.

I look forward to another amazing term with SPE-KSA, and wish my fellow volunteers all the success moving ahead.



**Arwa AlHilal**  
Lead, Medical Coding



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# SPE ANNUAL 2019 TECHNICAL CONFERENCE & EXHIBITION

A MESSAGE FROM SAMI ALNUAIM



Oil & Gas professionals from around the globe attended the 2019 Annual Technical Conference and Exhibition (ATCE) in Calgary, Canada to discuss hot topics related to safety, sustainability and technology advancement in the Exploration & Production (E&P) sector. ATCE is one of the largest gatherings for the industry. The conference includes: 300+ technical presentations, special sessions on relevant industry topics, 200+ exhibiting companies, 30+ training courses, multiple networking events and more than 5,000 industry attendees.

The below summarizes the opening remarks delivered by Dr. Sami A. Alnuaim, the 2019 president of the Society of Petroleum Engineers (SPE), in which he focused on sustainability and the future of Oil & Gas.

## Sustainability

When I first learned that I had been selected as SPE President, I had no doubt that I wanted to focus on sustainability. I aimed towards, first, sparking conversations that can change the future of our industry tremendously and help maintain our license to operate and, second, meeting the current global energy demand without compromising the capability of meeting future needs. In this article, I will shed light on the importance of sustainability from the social, environmental and economic perspectives and how it relates to us: the bright people of Oil & Gas.

## Social Responsibility

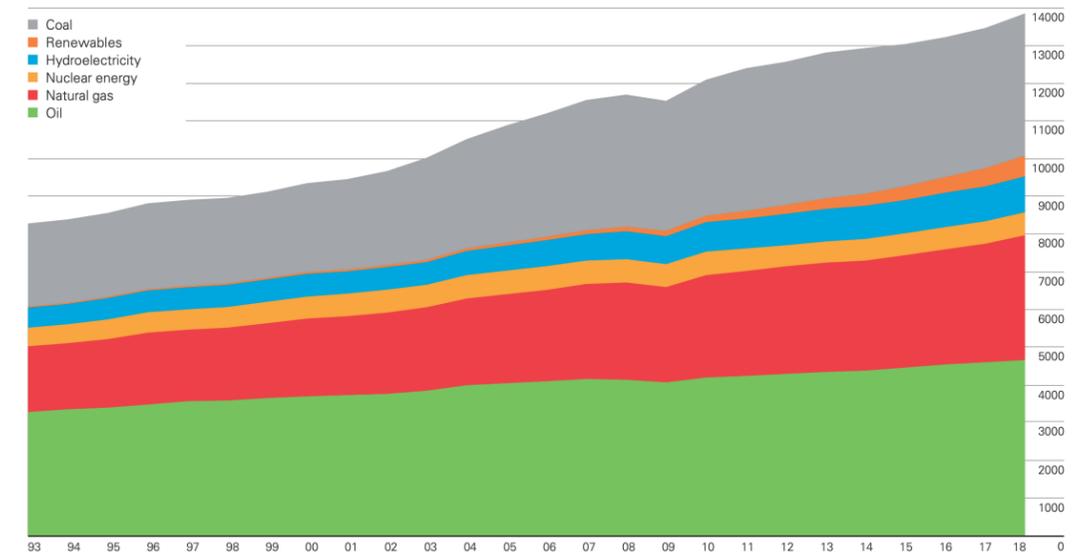
My goal was to strengthen the dialogue on the perception of our industry and the respect our work deserves. I wanted to show the world that Oil & Gas producers are part of the solution to the world's environmental and social development challenges. I wanted Oil & Gas professionals to be proud to work in an industry that positively influences the lives of billions of people.

However, for our contributions to be respected, we must address the public challenges facing our license to operate. We must recruit and develop "Citizen Engineers" who not only manage hydrocarbon resources effectively, but also have a strong sense of community and environmental awareness.



## Economic Growth

I believe it is important to remember the values our industry brings to society. This industry is a powerful driving force for global economies. Oil & Gas are instrumental in creating jobs, developing infrastructure and accelerating social development in ways that no other industry can come close to. The value that Oil & Gas brings to human life is measureless — products made from petroleum are literally everywhere.



Global energy consumption increased by 2.9% in 2018. Growth was the strongest since 2010 and almost double the 10-year average. The demand for all fuels increased but growth was particularly strong in the case of gas (168 mtoe, accounting for 43% of the global increase) and renewables (71 mtoe, 18% of the global increase). In the OECD, energy demand increased by 82 mtoe on the back of strong gas demand growth (70 mtoe). In the non-OECD, energy demand growth (308 mtoe) was more evenly distributed with gas (98 mtoe), coal (85 mtoe) and oil (47 mtoe) accounting for most of the growth.

Source: BP 2019 statistical review of world energy

I believe that our industry is strong, and that oil and gas will continue to supply more than half of the world's energy needs for decades, even as renewable energy sources grow. Global energy demand continues to rise, yet nearly a billion people on our planet still lack access to energy. With expected population growth, Oil & Gas will continue to be needed as part of the overall energy mix. Anyone who has worked in developing countries has observed how the revenue, jobs and infrastructure that our industry bring can transform human lives. The value we provide to society is truly immeasurable.

## Honoring the Environment

Reducing carbon emissions to protect our environment is as vital to the future of our industry as it is difficult to achieve. I have met with hundreds of SPE members who share my passion and are eager to find solutions to these challenges. I can clearly see that we are moving in the right direction. I believe that all SPE members must be the stewards of the future of this industry by performing their jobs with excellence, integrity and pride while caring for their communities and environment.

Industry leaders continue to implement best practices to reduce their carbon footprint and place a major emphasis on R&D that supports sustainability initiatives. I have been honored to participate in the September 2019 Oil & Gas Climate Initiative (OGCI) - CEO Technology Showcase - in New York, at which 13 major International Oil Companies (IOCs) and National Oil Companies (NOCs) presented their top de-carbonization efforts and technologies that address the current challenges of climate change. I strongly encourage all Oil & Gas companies to join this effort and learn from their environmental stewardship strategies. Successfully arresting climate change towards the United Nations' goals of near zero net CO2 emissions and low methane emission by 2050 will require massive collaboration across many industries such as Oil & Gas, coal, agriculture, forestry, cement and steel. Thankfully, many prominent Oil & Gas companies are already making this issue a major priority.



## Remarkable Effort

As I traveled the world this year, I have been proud to see the efforts happening in our industry, in universities and in associations to address the challenges of climate change and the environment. I was pleased to be a part of the University of Houston's launch of two new centers – one for carbon management and one for corporate social responsibility. I am also pleased to know about UT Austin Sustainability Centers: Water Management, Human Behavior and Performance Quantification of Sustainability. I have met and presented in many external stakeholder groups over the past year: the International Energy Agency, Chatham House, Atlantic Council, the Oil and Gas Climate Initiative and a host of Washington DC-based organizations. Discussions on these issues resulted in a useful dialogue to compound our individual efforts and move us forward. We are making significant investments and focusing R&D efforts on carbon capture and storage, reducing emissions, increasing energy efficiency, reducing water consumption and so much more. We have always been innovators, and I am confident that we will rise to the challenges.



## Towards Meeting Global Demand

The world needs energy and global demand for energy continues to climb. Oil and gas will be necessary to meet that demand, even as renewables see significant growth. I have been pleased to see how engagement around sustainability has grown over the past year. Working with the SPE HSE & Sustainability team, we held the first Gaia Summit in June of 2019 to bring together a range of internal and external stakeholders to discuss accelerating sustainability initiatives. I believe that we have laid the groundwork for continued activity and growth in this area. The pressures facing our industry and changing public perceptions make it crucially important that we spread the messages of what we are doing and how our industry contributes to the world's growth, prosperity and its environmental challenges.

I continue to challenge you, the members of SPE, to become the stewards of the future of this industry and our beloved environment by performing your jobs with excellence, integrity and pride. In conclusion, I would like to ask you, my respected readers, to think of tackling the questions below in order to implement sustainability within our industry truly and rapidly.

- How will we balance improving people's lives through hydrocarbon development, while maintaining our Earth, as we know it today?
- Which new technologies could help us to become more effective in these efforts?
- How has our public perception changed, and what must we do to maintain our license to operate?





**SPE-KSA  
PROUD  
MOMENTS**



The Saudi Arabian Section was awarded the **2019 Section Excellence Award** during the ATCE.



The section also won **2 excellence awards for student chapters** in recognition of their efforts in industry engagement, community involvement and professional development.



**Harry D. Oduro**  
SPE Regional Award in Completions Optimization and Technology



**Adib A. Al-Mumen**  
SPE Regional Award in Drilling Engineering



**Shouxiang Mark Ma**  
SPE Regional Award in Formation Evaluation



**Khalid S. Al-Zamil**  
SPE Regional Management and Information Award



**Anuj Gupta**  
SPE Honorary Member Award



**Dhafer A. Alshehri**  
SPE International Distinguished Membership Award



**Sameeh I. Batarseh**  
SPE International Distinguished Membership Award



**Fakuen Frank Chang**  
SPE International Distinguished Membership Award



**Abdulrahman Ahmad Al-Ghamdi**  
SPE Regional Sustainability and Stewardship in the Oil and Gas Industry



**Yousif M. Altahan**  
SPE Regional Service Award



**Subhash Ayirala**  
SPE Regional Service Award



**Fatemah H. Abudeeb**  
SPE Regional Young Member Outstanding Service



**Kenneth R. Kibodeaux**  
SPE International Distinguished Membership Award



**Saeed M. Mubarak**  
- SPE International Distinguished Membership Award  
- SPE International Distinguished Service Award



**Mohammed Badri**  
SPE International Distinguished Service Award



**David G. Kersey**  
SPE International Distinguished Service Award



**Suha N. Kayum**  
SPE Regional Young Member Outstanding Service



**Geoff Downton**  
Schlumberger Fellow and Senior  
Technical Drilling Advisor



# DISTINGUISHED LECTURER PROGRAM

ROTARY STEERABLE SYSTEMS CURRENT TRENDS AND FUTURE DIRECTIONS

October 9<sup>th</sup>, 2019

As part of their Distinguished Lecturer Program, Technical Programs hosted Mr. Geoff Downton in an insightful lecture at Salat Al Khalej on October 9th, 2019. Attendance was at full capacity with more than 70 individuals present and eager to learn about the current and future trends of rotary steerable systems (RSS). Mr. Downton began with an introduction about the history of common directional drilling systems and how RSS came about in the late 1990s. The presentation then focused on the benefits, features, challenges and opportunities facing RSS.

“Drilling robots” is what Mr. Downton used to describe RSS systems that were introduced in 1998. They were developed and used to access a reservoir in Poole Harbour in the United States, as shown in the picture below. One of the main benefits of using RSS is that the direction of hole propagation can be controlled whilst the drill string continuously rotates. This enables high quality boreholes to be drilled faster and further than other methods. Mr. Downton went on to explain some of the key technology enablers for RSS such as: robust electronics, communication where information is more versatile, robust sensors, material advances and more.

Since its first appearance in the late 1990’s, RSS systems have undergone numerous developments. Some of the opportunities that were presented include: lower costs yet higher reliability, higher doglegs at higher ROP, drilling automation, opportunities with data analytics and more. The U.S.’s land shale is playing a huge role in driving innovation of new RSS concepts with more integrated solutions such as minimizing the total system’s complexity. Mr. Downton concluded his presentation by talking about how vibrant RSS technology is and how, after 25 years, it continues to evolve. After the presentation, Mr. Downton answered some of the audience’s questions in a fruitful Q&A session. Lastly, an award was presented to Mr. Downton by SPE-KSA’s Chairman, Mr. Abdulaziz Al-Sufayan, and SPE-KSA’s Technical Programs Chairperson, Mr. Nassir Abalkhail as a gesture of appreciation for his vibrant presence and informative lecture.

Written By: Muneera Aldamer



from left Nassir Abalkhail, Geoff Downton, Abdulaziz Al Sufayan, Maher Rehayyem



Geoff Downton



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**Ed Abbo**  
President and CTO at C3.ai



# OCTOBER DINNER MEETING

## OPERATIONALIZING ARTIFICIAL INTELLIGENCE AT INDUSTRIAL SCALE

October 30<sup>th</sup>, 2019

On October 30th, 2019 the SPE-KSA Technical Programs team had a successful inaugural Dinner Meeting with Mr. Ed Abbo, President and Chief Technology Officer at C3.ai, as their esteemed guest and keynote speaker. The event took place at the Kempinski Al-Othman Hotel in Al-Khobar with around 500 attendees from different companies and professional backgrounds. Since digital transformation is currently one of the most discussed topics in the industry, Mr. Abbo accentuated the importance of Artificial Intelligence (AI) at an industrial scale.

C3.ai is an AI software business that supports different organizations in accelerating their digital transformation process through providing AI and Internet of Things (IoT) software. Mr. Abbo is currently heading C3.ai and has various roles, from leading the company's strategy to getting involved with its operations. Prior to C3.ai, Mr. Abbo was the Senior Vice President at Oracle Cooperation in 2006 and directed its application products. And before that, he was the Senior Vice President of Engineering and Chief Technology officer at Siebel Systems. Mr. Ed Abbo has a Master of Science in Mechanical Engineering from the Massachusetts Institute of Technology and a Bachelor of Science in Mechanical & Aerospace Engineering from Princeton University.

The event commenced with a welcoming message from the Technical Programs Chairperson, Nassir Abalkhail and followed with opening remarks from SPE-KSA's Chairman of the Executive Board, Mr. Abdulaziz Al Sufayan, who highlighted the section's various new and exciting initiatives. Afterwards, Mr. Abbo took the stage and started off his speech with an introduction to C3.ai, which was established 10 years ago in order to assist companies in applying AI rapidly and at scale to transform their businesses. He then talked about the technological disruptions that changed industries forever. Since the early 2000s, 50% of the Fortune 500 companies, such as Sears and Blockbusters, have ceased to exist. Similarly, another 40% of companies will not survive the next 10 years and Mr. Abbo called that "Corporate Mass Extinction".

On the other hand, he showcased disruptive companies that adopted the "New Corporate DNA" and emerged out of nowhere such as Amazon, Uber, and Netflix. Most of these disruptive companies are asset light and are just processing data. He further explained how 70% of companies will attempt to get on board with this digital transformation trend but only 21 of them will actually make it. To be able to understand these changes, Mr. Abbo described the drivers behind digital transformation such as big data, elastic cloud computing, IoT, and AI machine learning. He believes that the business opportunity here is bigger than \$5.1 billion and goes beyond oil & gas where it serves all industries.

Mr. Abbo supported his speech with examples of large companies working with C3.ai on implementing AI at an industrial scale such as Enel, US Air Force, Baker Hughes, and Shell. Enel, a large Italian power company with more than 73 million customers, first approached C3.ai to gain support in building a reliability application that uncovers those stealing power. Enel went from losing billions because of this issue to reaching economic benefits that reached \$2.5 billion. Another example is the U.S. Air Force, which has numerous types of aircrafts but decided to allow C3.ai to work with the most difficult plane, manufactured in the 1950s with no sophisticated sensors and simple data. By the end of the project, they were able to identify 40% of failures before they happen and they did it within a timeframe of only 6 months. After that success, the U.S. Air Force decided to scale it across 5,000 different planes, which speaks to what Mr. Abbo said: "You aim big, start small, and scale quick."

The examples then shifted to the oil & gas industry, starting with Baker Hughes, that invested in digital transformation within the upstream, midstream, and downstream business lines. They worked closely with their customers on building different applications such as reliability apps and production optimization applications. As for Shell, they spent 3 years assessing many AI platforms and applications from different companies and ultimately chose C3.ai because they were faster and more efficient. Their first project was a reliability application that dealt with valves and took only 5 weeks to develop.



Nasir Al-Naimi, Vice President, Petroleum Engineer & Development, Saudi Aramco and Chairman of the Board of Directions, SPE-KSA



from left Nassir Abalkhail, Abdulaziz Al Sufayan, Ed Abbo, Nasir Al-Naimi



from left Bander Al-Ghamdi, Khalid Zainalabedin, Abdulaziz Al Sufayan

Finally, Mr. Abbo concluded his speech with a Q&A session with the audience. One question was with regards to the biggest challenges companies face with digital transformation. Most companies suffer with change management and how to get people to change their ways. User adoption is a common challenge that is still beyond the capabilities of many companies. Another question was about the essential skills people must acquire in order to adopt AI. Mr. Abbo insisted that the talent pool in Saudi Arabia is strong and having a PhD in math and software development will strengthen it further. He also talked about the importance of business executives learning about AI and what it can and cannot do since "it is not magic".

The event was concluded with a special token of appreciation presented from Mr. Nasir Al-Naimi, SPE-KSA Chairman of the Board of Directions and VP of Petroleum Engineering and Development at Saudi Aramco, Mr. Abdulaziz Al Sufayan, SPE-KSA Chairman of the Executive Board and Mr. Nassir Abalkhail, SPE-KSA Technical Programs Chairperson, to Mr. Abbo for an enlightening knowledge sharing session and his valuable contributions.

Book Recommendations by Mr. Abbo:

- "Digital Transformation" by Thomas M. Siebel
- "The Master Algorithm: How the How the Quest for the Ultimate Learning Machine Will Remake Our World" by Pedro Domingos
- "Punctuated Equilibrium" by Stephen Jay Gould

**Written By:** Muneera Aldamer



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from left AbdulHameed Al-Rushaid, Nasir Al-Naimi, Ed Abbo, Mahmoud Abdulbaqi



Nassir Abalkhail, Technical Programs Chairperson, SPE-KSA



Abdulaziz Al Sufayan, Chairman of the Executive Board, SPE-KSA



## SPE-KSA: LOYALTY PROGRAM

The Society of Petroleum Engineers (SPE) is the largest individual-member organization serving professionals worldwide in more than 147 countries. The organization was officially founded in 1957, while its predecessor organizations date from the birth of the oil industry in the late 1880s.

Since its foundation, professionals in the exploration, development and production of oil and gas were able to collect, disseminate and exchange technical knowledge.

SPE-KSA, in its continuous efforts to support its members and the community, started the "SPE-KSA Loyalty Program". The Loyalty Program is a new initiative by the Memberships team to promote local businesses by advertising their services and products to more than 10,000 members within Saudi Arabia. The program offers SPE-KSA members discounts from selected retailers, shops, restaurants and service providers. Discounts at selected establishments range from 5-20%.

More information regarding the Loyalty Program can be found on the SPE-KSA website and the Loyalty Program printed booklet. Selected participating businesses will be showcased in other platforms as well and will participate in selected events based on offered discounts and members' satisfaction.

We are pleased to announce our collaboration with the establishments below:



**More collaborations to come!** Follow us on our social media platforms, download our app and visit our website to be up-to-date with the Loyalty Program and the many other opportunities and benefits that SPE-KSA has to offer!

For further information, please feel free to contact the SPE-KSA section membership chairperson, Mr. Othman M. Qasim at [othman.qasim@spe-ksa.org](mailto:othman.qasim@spe-ksa.org).

To learn more about SPE-KSA, please visit our website:  
<https://spe-ksa.org/>  
 To join SPE-KSA, please scan the QR code:



# 89TH SAUDI NATIONAL DAY CELEBRATION

AT SCITECH

September 23<sup>rd</sup>, 2019

The SPE-KSA T&SA team celebrated the Kingdom's 89th National Day on September 23<sup>rd</sup>, 2019. The celebration was hosted in collaboration with SciTech, which was the venue where the event was held.

The event involved several activities targeting all age groups and falling under the theme of Saudi culture and history. A total of 5000 visitors, both individuals and families, participated in and thoroughly enjoyed the activities that included:

- A fingerprint map that reflects the attendees' hometowns
- The Rush Challenge game
- Heads-up game
- Face painting
- Henna
- Hospitality tent with a Saudi falconer
- Photo booth

Several Social Media influencers such as Mr. Salah M. Zamil and Mr. Saad AlDossary visited the event and commended the activities and the organization. The event was also covered by Saudi TV.

The team was honored to have U.S. Consul General Rachna Sachdeva Korhonen, the Director of KFUPM, Dr. Sahel Bin Abduljawad and the President of Saudi Commission for Tourism and National Heritage, Mr. Abdullatif M. Bonyan attending the event and participating in the activities.

Mr. Mohammed Mishkhass, T&SA Chairperson and Mrs. Hala Shuhail, the event leader, were delighted to visit SciTech Management after the event to honor them and present a token of appreciation for their enormous support and cooperation.

**Event Lead:** Hala Shuhail  
**Written By:** Arwa AlHilal



from left Abdulaziz Al Suwailem, Abdulaziz Al Sufayan, Abdullah Al Mulhim



U.S. Consul General Rachna Korhonen



from left Sahel Bin Abduljawad, Abdullatif Bonyan



# HALLIBURTON 100 YEARS



Inspired by the past. Leading into the future.

## THE NEXT 100 YEARS

With the same values that have sustained the Company for the past century, Halliburton is leading into the future with a continued focus on innovation, collaboration, and execution to deliver superior customer service and unparalleled industry returns.

Halliburton has been present in the Kingdom for more than 80 years and we are fully aligned with the nation's Vision 2030.

Through our commitment in supporting the Kingdom's vision 2030 plan and Saudi Aramco's IKTVA program, our focus remains on increasing our nationalization, local content sourcing, and employee development. Additionally, we are committed to investing in manufacturing, improving technology dissemination, and providing more opportunities to Saudi women to achieve a more diverse workforce than ever before.



### Halliburton's In-Kingdom Business Model Drives a High Value-Addition and Superior Service Levels

At Halliburton Saudi Arabia, we are excited to expand our investments in the Kingdom with local manufacturing capabilities. We are also working with small and medium enterprises to build a local supply chain and provide opportunities to develop and commercialize Halliburton's Intellectual Property (IP). It is our priority to support the Kingdom's 2030 vision and Aramco's

IKTVA program and partner in the current and future growth of the Kingdom. Our talented local workforce drives solutions with a faster and stronger in-country infrastructure. Our focus is to achieve 70% Saudization by the end of 2019. A few notable milestones reached and on the horizon are:

### Commercial operation of Sperry Motors Center of Excellence in Dammam – Operational in 2019

The first of its kind in the Eastern Hemisphere for Halliburton; this facility combines specialized engineering and manufacturing capabilities to customize mud motor design and provide customers with engineered solutions for their basin specific challenges.

### Manufacturing of completion products - Q4 2019

A diverse range of completion and casing equipment will be manufactured in our manufacturing facilities in Dammam. These will be merged into a Halliburton facility in the King Salman Energy Park (SPARK).

### Enhancing vendor capabilities

- A dedicated and experienced manufacturing team, stationed in-Kingdom, is focusing on vendor capability enhancement and support to establish primary and secondary processes. This covers both metallic and non-metallic processes (elastomers).

### Research & Development (R&D), Technology & Digitization

- Our Technology Center provides valuable insight and solutions to meet the unique challenges of the Kingdom through research and development.
- We are working in close collaboration with various universities and sharing knowledge obtained through decades of research.
- Our new Digital Rock Lab in Saudi Arabia is the first of its kind in the Eastern Hemisphere. It provides a systematic approach for characterizing rocks using a variety of imaging technologies to produce digital versions of a rock. These models measure both static and dynamic rock properties from core analysis, facies analysis, zonal analysis, and pore analysis.

### Halliburton SPARK Facility

- A mega facility in King Salman Energy Park which carries out manufacturing and assembly operations for Halliburton business lines and product offerings including Completion Tools, casing equipment,

Wireline & Perforating, Drill Bits, Sperry Drilling, Testing and Subsea – Ground breaking is expected in 2020 with production in 2021.

### Construction commencement on Halliburton Multi-Chem Chemical Manufacturing Plant in Jubail – Commercial operation in 2021

- Fully automated stainless steel and corrosion resistant reactors to accommodate a broad range of reactions Production of ethylene oxide (EO), propylene oxide (PO) based products
- Onsite laboratories with quality assurance and quality controls
- Pilot plants to bridge research and development to commercialization without risking customer production
- High capacity blending to maximize throughput and efficiency
- Focus on local raw material supply
- Strategic positioning of plant for pipeline supply of EO and PO, and to benefit from emerging chemical sector
- Packaging and bulk delivery capabilities to meet local and regional customer needs



## DRILLING AUTOMATION

### Sperry Drilling – Smart Design Meets Drilling Automation

Predictive analytics, the Internet of Things, artificial intelligence – these are not buzz words anymore – they are digital, automated technologies rapidly transforming the oil and gas industry. Halliburton’s digital transformation is changing the way we connect to the reservoir, operations and equipment (on the surface and downhole), and is helping improve the way we collaborate with customers.

On the path to drilling automation, Halliburton Sperry Drilling introduced the iCruise® intelligent rotary steerable system (RSS) to the Saudi market in 2018, and has been expanding its operational capabilities in the Kingdom. Our expectation is to grow the fleet to help operators reduce well time through faster drilling, accurate steering, and improved reliability. By providing operational support for the iCruise RSS in-Kingdom, we can achieve a faster turnaround time to the rig site, maximizing customer asset value. Our talented Saudi workforce is undergoing training at state-of-the-art facilities in Dubai and Houston to learn the capabilities and operations of this new RSS.

This intelligent push-the-bit system features 400 RPMs, proprietary self-diagnosis and self-prognosis digital electronics, multiple downhole sensors, 1,000 measurements per second, three distinct survey packages, and six high-speed processors for complex computations.

The intelligent RSS is also enabled for automated drilling. It is equipped with vertical and lateral CruiseControl™ technology to steer and place wells accurately. In addition, it is integrated with LOGIX™ automated drilling director which uses intricate physics-based models, sophisticated algorithms, and machine learning to project the well path and avoid collisions, manage vibration, and control steering.

Halliburton designed the LOGIX software by creating digital twins of the BHA and of the reservoir in order to help operators’ complex drilling scenarios and geological uncertainties in real-time, visualize outcome, and use data analytics to optimize current drill plans. The software also identifies formation tendency, estimates current and future tool outputs, and adapts to changes in the coming trajectory, allowing the operator to mitigate borehole tortuosity while building a sufficient safety margin. This ensures smooth landing of the drilling curve to reach the planned target accurately and on time. By automating the drilling process, Halliburton can help the Kingdom maximize asset value through reduced Non-Productive Time (NPT), fewer rig site personnel, and lowered costs per barrel of oil equivalent (BOE) while delivering predictable, consistent, and repeatable results.



## DIGITAL TWIN OF THE BHA - PROJECT WELL PATH, MAKE SMART DECISIONS, ACHIEVE PREDICTABLE AND CONSISTENT RESULTS



### Landmark Software and Services - Digital E&P Transformation

Halliburton has been helping customers in Saudi Arabia and across the globe with their digital transformation journeys through the deployment of high-end technologies. Landmark is at the forefront of this digital transformation collaborating with customers by delivering lifecycle insights from an oil & gas digital twin on an open platform called DecisionSpace®. Our SmartPlatoon™ teams continue to deliver value for our customers engaged in complex projects across domains. SmartDigital™ is a service methodology from Halliburton Landmark that accelerates the transformation of E&P internal intellectual property and ideas into digital software solutions that drive digital outcomes. The SmartDigital™ approach combines a proven methodology, Halliburton’s digital E&P platform, a modern software development environment and the skilled team (SmartPlatoon™) required to rapidly build digital solutions for our customers’ specific business needs.

### Artificial Lift – Summit ESP® Expands to Saudi Arabia

The artificial lift business in the Middle East is expanding as operators continue to look for ways to extend the economic life of their wells. Halliburton acquired Summit ESP® in 2017, which expanded our existing artificial lift capabilities and footprint, especially in North America. We are now actively growing on an international level in several locations including Saudi Arabia, where we successfully installed our first electric submersible pump in October 2019 and plan to install several more over the coming months. Summit ESP electric submersible

pumps have been developed to provide a robust, wide range of produced volumes from 25 bbls to over 30,000 bpd. Not only is the equipment and technology cutting edge, but Summit ESP also prides itself on its Gold Standard of Service. This is where we collaborate with our customers to understand their concerns and objectives in order to design tailored solutions. This customized approach has allowed Summit ESP to become the #1 electric submersible pump provider in North America and will allow us to expedite the delivery of our product and service capabilities to our international customers.



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# TURN UP THE PINK

October 25<sup>th</sup>, 2019

In the spirit of promoting awareness on Breast cancer and supporting sufferers and survivors of this condition, the T&SA team held Turn Up the Pink Event at Salt AlBahar.

The event involved several activities, both entertaining and educational:

- Walk for A Cure Challenge which was launched one week before the event to encourage the habit of walking and overall exercise as preventative measures
- Hunt for A Cure which is similar to the well-known game, Scavenger Hunt, but was customized to fit the theme of Breast Cancer in an educational, fun manner
- Face Painting
- Breast Cancer Themed Photo Booth
- Storyteller for kids
- Origami for Kids
- The Punch Game
- Inspirational Quotes by the attendee for the patients and survivors on a Cherry Blossom Tree
- A Booth For Saudi Cancer Foundation (SCF) to sell Breast Cancer Awareness products

The winner of the Walking Challenge, Bashayer Al AlOthri, was invited to be honored on the day of the event and was presented a valuable subscription at Gusaibi Sports Center. T&SA was honored by the visit of Mr. Abdulrahman AlShahrani from the Saudi Cancer Foundation.

The unique location and diverse range of activities that were targeting several age groups along with the exceptional efforts of the organizers and volunteers resulted in the success of the event!

Written By: Arwa AlHilal



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from left Turki Gaboul, Mohammed Al-Mishkhas, Abdulrahman AlShahrani, Abdulrahman Al-Naim



# Breast Cancer

— AWARENESS —

## ALSHARGYIAH WARDYIAH SPE-KSA PARTICIPATION

October 1<sup>st</sup> - 7<sup>th</sup>

The SPE-KSA T&SA team had the pleasure of participating in AlShargyiah Wardyiah, the biggest Breast Cancer Awareness Campaign held annually in the Eastern Region.

The event was held over a period of seven days at Al Rashid Mall. T&SA participation focused on raising awareness on breast cancer and encouraging females over the age of 40 to visit the early detection center. In order to further incentivize women to get examined, T&SA distributed cards with gifts that can only be claimed upon their completion of the exam at the center.

The booth also aimed to promote SPE-KSA to the public and educate them about the section's roles and initiatives in both the community and industry. This was done in an effort to attract potential volunteers for future T&SA activities.

The event was attended by key members from the Municipal Council and General Secretariat and the renowned charity organizations in the region. Furthermore, the event included an inspirational speech and visit by the Cancer Survivor, Ambassador and Social Media Influencer, Juwaireya, from the Kingdom of Bahrain.



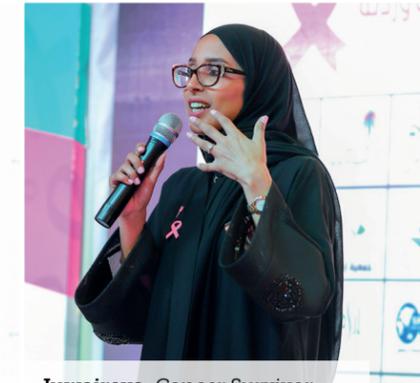
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Breast Cancer Awareness Events Leads:  
Reeman Bamousa  
Nahid Al Dossari

Written By: Arwa AlHilal



Malik Attar, Petroleum Engineer, Saudi Aramco



Juwaireya, Cancer Survivor, Ambassador and Social Media Influencer, Kingdom of Bahrain

# DIVING WITH PURPOSE

November 2<sup>nd</sup>, 2019

The Trips & Social Activities team was pleased to collaborate with The Eastern Province Municipality and Borders Guards to conduct "Diving with Purpose", a beach and seabed cleanup campaign.

The organizing entities managed to form a team of 55 diving volunteers for the cleanup activity. This was a one-day campaign at which volunteers worked tirelessly for a total of 7 hours collecting organic and non-organic waste. The discarded waste weighed half a ton containing glass, wood and plastic.

The goals of this campaign were to: 1) Raise awareness about the importance of environmental preservation, 2) Promote volunteerism to protect our environmental resources and save them from pollution and 3) Emphasize that this is a mutual responsibility on all members of the community.

**Events Lead:** Ala'a Al-Salman

**Written By:** Arwa AlHilal



**Abdulaziz Al Sufayan**, Chairman, SPE-KSA



**Abdulrahman Al-Musare**, Planning & Coordination Chairperson, SPE-KSA



**Mohammed Al-Mishkhas**, Trips & Social Activities Chairperson, SPE-KSA



**Abdulrahman Al-Naim**, Information Technology Chairperson, SPE-KSA



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# BLOOD DONATION CAMPAIGN

September 15<sup>th</sup> - 16<sup>th</sup>, 25<sup>th</sup> - 26<sup>th</sup>

The SPE-KSA T&SA team initiated the annual blood donation campaign during the month of September, 2019. The campaign was conducted in collaboration with King Fahad Specialist hospital and was held as following:

- On September 15– 16<sup>th</sup>, the campaign was hosted by Halliburton with a total of 55 donors and an estimated 25 liters of donated blood.
- On September 25–26<sup>th</sup>, the campaign was hosted by Schlumberger with a total of 94 donors and an estimated 43 liters of donated blood

The campaign is expected to continue in the following months in order to cover Saudi Aramco and more services companies that will be announced once confirmed.

**Event Leads:**  
Arwa AlHilal  
Mai Al Kahlan  
Hawazen Al Otaibi

**Written By:** Arwa AlHilal



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from left, Samer Salous, Abdullah alshehry



# ENERGY4ME “TRAIN THE TRAINER” WORKSHOP

LOU JEAN RODRIGUEZ  
ENERGY EDUCATION SPECIALIST - SPE

September 14<sup>th</sup>, 2019

The Energy4Me “Train the Trainer” workshop was held in Al Othman Office Tower in Dhahran on September 14<sup>th</sup>, 2019. The workshop was attended by 14 participants from both Saudi Aramco and Halliburton, all whom are SPE Members.

The SPE-KSA Student Outreach team, in collaboration with the SPE Dubai office, organized the first Energy4Me certifier workshop titled “Train the Trainer”. This marks the very first time that this workshop is held in the GCC area.

Lou Jean, from the SPE Dubai Office, delivered the workshop to 11 SPE-KSA members in order to certify our trainers for Energy4ME training purposes and consequently spread knowledge and awareness about the Oil and Gas industry.

By the end of the workshop, all 11 participants were awarded the Energy4Me trainer certificate. At the end of the workshop, the SPE-KSA Student Outreach extended a token of appreciation to Lou Jean for her time and dedication.

**Written By:** Seba Almaghlouth



from left Rabab Meshikhes, Lou Jean Rodriguez, Seba Almaghlouth



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# VISIT TO COLLEGE PREPARATORY PROGRAM (CPP)

October 8<sup>th</sup>, 2019

The Student Outreach Team paid a visit to the College Preparatory Program (CPP) students at Saudi Aramco on October 8th, where a total of 200 males and females were in attendance. Student Outreach team members delivered a 40-minute presentation highlighting the status of the Oil & Gas industry and the role of petroleum engineers. A brief overview of the O&G journey was shared with the students as well.

The team also introduced SPE-KSA and the various benefits of being an SPE member. During the discussion, the students were interactive and enthusiastic about the opportunities offered by SPE-KSA, and were also excited to volunteer with SPE-KSA to fulfill their required community involvement hours.

Written By: Sarah Alamer



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# AMBASSADOR LECTURER PROGRAM

SCHOOL VISIT TO DHAHRAN AHLIYAH SCHOOL, ALHUSSAN SCHOOLS AND ALBASSAM SCHOOL

October 8<sup>th</sup>, 2019

As part of SPE-KSA's efforts to create a bridge between our professionals and the student community, the Student Outreach Team visited five schools in the Eastern Region during the month of October. On October 8th and 9th, SPE-KSA members participated in a 2-day college fair organized by the Dhahran Ahliyyah School. Over these two days, more than 600 high school students, from both government and private schools, visited the college fair. Furthermore, the Student Outreach Team arranged visits to AlHussan and AlBassam Schools (males and females) and shared knowledge and experience about the industry through sessions that were delivered by the section's talented engineers. Each visit encompassed nearly 100 high school students, bringing the total number of students reached this month alone to 900. Due to the great feedback the team received from the schools, the visits will continue, and the team will expand their reach to schools both in and out of the region.

Written By: Sarah Alamer



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# AMBASSADOR LECTURER PROGRAM

UNIVERSITY VISITS TO PRINCE MOHAMMAD BIN FAHD UNIVERSITY AND KING SAUD UNIVERSITY

October 17<sup>th</sup>, 2019

The SPE-KSA Student Outreach team met with two SPE Student Chapters in two different universities on October 17<sup>th</sup>: SPE-PMU and SPE-KSU.

During their SPE-PMU visit, the team sat with Dr. Jamal Nayfeh, Dean of College of Engineering, to kick off this year's activity calendar. The visit had a total of 13 attendees including the SPE student board members and the faculty involved. Dr. Nayfeh delivered the meeting's agenda and the students presented their ideas and plans for the upcoming year and discussed the challenges they faced in the past and how to best mitigate them moving forward. Finally, the participation of PMU students in research plans focusing on IR 4.0, digitization and sustainability was discussed.

By the end of the visit, all 15 participants were recognized and appreciated for their valuable time and effort. SPE-KSA Student outreach also extended their sincere appreciation for Dr. Jamal Nayfeh for his time and dedication.

The team also paid a visit to the Department of Petroleum and Natural Gas, College of Engineering, King Saud University in Riyadh. There were 13 attendees including SPE members from Saudi Aramco and KSU, both faculty and students. SPE-KSU's plans for 2019-20 and the support that can be provided to the students were discussed. Student Outreach members were requested to assist in enabling visits to Saudi Aramco's facilities and providing educational material, all in an effort to improve the learning experience for KSU's petroleum engineering students.

Meshal Alshalan, Team Lead of SPE-KSA's University Outreach, recognized KSU's PetroBowl 2019 team with acknowledgement certificates for their contribution in this international event.



**Written By:** Mohammed Alatigue, Heba Alsoqair, Abdolrahman A. Alsaif, Asma Alahmadi and Meshal Alshalan

# STUDENT OUTREACH ENGAGEMENT

IN THE NATIONAL SCIENCE WEEK AT SCITECH

October 27<sup>th</sup> - November 2<sup>nd</sup>, 2019

The SPE-KSA Student Outreach team, in collaboration with SciTech, successfully engaged with and participated in the National Science Week that took place in SciTech during the week of October 27<sup>th</sup> – November 2<sup>nd</sup>. During this period, 15,000 students from local schools visited the SPE-KSA booth where our volunteers shared and discussed the opportunities available within SPE-KSA and the Student Outreach Program in particular. In addition, the team shared the academic and professional benefits of getting involved in the section and its activities.

In parallel, the Student Outreach Team capitalized on their recently-certified Energy4Me members and successfully delivered 20 hands-on Energy4Me workshops during the five-day event to more than 370 students in the science labs. The students benefited from the discussion and hands-on experiments and better-understood the significance of energy in our lives, and the hydrocarbon lifecycle. This collaboration is one of many that SO intends to continue in order to promote the oil and gas industry to the Kingdom's ambitious youth.

The team was recognized for its active participation by the Director of KFUPM, Dr. Sahel AbdulJawad, the Director of SciTech, DR. Hasan Al-Ahmadi and the Director of Education in the Eastern Province, Dr. Naser AlShalaan.

**Written By:** Rabab Meshikhes



from left Naser AlShalaan, Seba Almaghlouth, Sahel AbdulJawad, Hassan Al-Ahmadi





# Recommended Reads by our SPE Leaders

By: Nof Alotaibi



**Dr. Mohammed Y. Al Qahtani**  
Senior Vice President,  
Upstream, Saudi Aramco  
Honorary Chairman of the  
Board of Directors, SPE-KSA



## The Fourth Industrial Revolution

By: Klaus Schwab

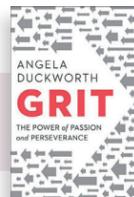
*"Together we can shape a future that works for all by putting people first, empowering them and constantly reminding ourselves that all of these new technologies are first and foremost tools made by people for people."*

World-renowned economist Klaus Schwab, Founder and Executive Chairman of the World Economic Forum, explains that we have an opportunity to shape the fourth industrial revolution, which will fundamentally alter how we live and work.

Schwab argues that the fourth revolution is different in scale, scope and complexity from any that have come before. Characterized by a range of new technologies that are fusing the physical, digital and biological worlds, the developments are affecting all disciplines, economies, industries and governments, and even challenging ideas about what it means to be human.

He outlines the key technologies driving this revolution and discusses major impacts expected on government, business, civil society and individuals. Schwab offers big ideas on how to harness these changes and shape a better future—one in which technology empowers people rather than replaces them; progress serves society rather than disrupts it; and in which innovators respect moral and ethical boundaries rather than cross them. We all have the opportunity to contribute to developing new frameworks that advance progress.

*"In the coming decades, the technologies driving the Fourth industrial Revolution will fundamentally transform the structure of the world economy, our communities and our human identities. These profound changes highlight the great responsibilities we face as civilization."*



**Nasir K. Al-Naimi**  
Vice President, Petroleum  
Engineering & Development,  
Saudi Aramco & Chairman of  
the Board of Directors, SPE-KSA



## GRIT: The Power of Passion & Perseverance

By Angela Duckworth

*"Our potential is one thing, what we do with it is quite another."*

In this must-read book for anyone striving to succeed, pioneering psychologist Angela Duckworth shows parents, educators, students, and business people both seasoned and new that the secret to outstanding achievement is not talent but a focused persistence called grit.

Why do some people succeed and others fail? Sharing new insights from her landmark research on grit, Angela

Duckworth explains why talent is hardly a guarantor of success. Rather, other factors can be even more crucial such as identifying our passions and following through on our commitments.

Here, she takes readers into the field to visit teachers working in some of the toughest schools, cadets struggling through their first days at West Point, and young finalists in the National Spelling Bee. She also mines fascinating insights from history and shows what can be gleaned from modern experiments in peak performance. Finally, she shares what she's learned from interviewing dozens of high achievers; from JP Morgan CEO Jamie Dimon to the cartoon editor of The New Yorker to Seattle Seahawks Coach Pete Carroll.

*Winningly personal, insightful, and even life-changing, Grit is a book about what goes through your head when you fall down, and how that not just talent or luck makes all the difference.*

## How Eating Less Meat Could Help Protect the Planet From Climate Change

By Abigail Abrams



**Dr. Sami A. AlNuaim**  
President, SPE 2019

This article explains how, according to the latest report by the United Nations body on climate science, by dramatically changing the food we eat as well as the way it is grown and produced, humans can help stop the devastating impacts of climate change.

As of now, only 25% of the world population consume meat, most of which are wealthy countries. However, as countries with historically low meat consumption get wealthier, they will consume more meat and put additional strain on the environment.

Meat such as beef and lamb is particularly inefficient to produce, as livestock require space to graze, resulting in deforestation. Not only do humans need to reduce the amount of land used to produce meat, but they also need to use that land more efficiently. Sustainable farming practices are necessary to ensure that land remains usable as the planet heats up. Lowering the amount of meat people eat would decrease emissions from livestock and the amount of fertilizer required to raise them.

Furthermore, climate change could harm food security at low-income countries that have not been leading contributors to global warming. Farmers will suffer the consequences of climate change by having to adapt to more intense weather patterns and land decreasing in yield.

When people around the world start making certain behavioral changes, they could free up several million square kilometers of land and reduce carbon emissions, contributing to help stop climate change.

To read more about this article recommended by our very own SPE President, please scan the QR code



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**Reema S. Sharaf**  
Accounting Staff Analyst, Saudi Aramco



## CONNECTION FROM WITHIN

Employee Engagement. Is this the first time you hear those words? Do you think it is a fad? A short-lived concept? What is Employee Engagement in the first place? If you look it up, you will find numerous definitions that quantify Employee Engagement and set up a framework or approach that measures it through percentages and mathematical equations. But I want you to think beyond numbers. Tap into the first thing that crossed your mind when you initially read those two words. Did you think “Oh, this again...” and rolled your eyes? Did you wait for a definition to be offered from my side? Or did you feel something? Hope, disappointment, anger, boredom, or curiosity? Because I want you to hold on to that first impression that you got from reading the words “Employee Engagement”, and be aware of how you’re linking the term back to yourself and your experiences.

To me, regardless of the presence of any quantitative elements of Employee Engagement, I just don’t consider it to be a process, statistic, or something that can be mathematically defined. I, personally, see that Employee Engagement is an attribute! And notice how I used the word see. It’s because I believe that it is something you show and actually carry with you to work. It is the attitude you choose to wear when you wake up in the morning. I also feel that it is the aura you give off when

people approach you. It is the overall demeanor you have throughout the day and the energy and performance level you decide to reach when taking on a new project. Employee Engagement is how we carry ourselves to work. It is our reactions, plans, worries, motivation, anticipation, preparation, and all the emotions we bring with us to work. It is us belonging to the place we work at and wanting to be a true part of it. We do utilize frameworks that define and measure Employee Engagement. And it’s only natural that when people want to understand something, they try to add structure to it, try to quantify it, and tie it back to a solid number or figure to make sense of it. But I want to take you out of all of that and get you to see the qualitative side of Employee Engagement and how you are contributing to it.

Reading this right now, I want you to reflect. Whether you are a Process Engineer, Contract Advisor, Vice President, Admin Clerk, or a Senior Counsel, reflect on yourself and on the degree of effort you put into your work. This will help you see your role in shaping Employee Engagement. Really think of the tasks you deliver on a daily basis; from small ones like setting up a meeting, to major ones like selling a strategy-shift proposal to management. How high of a standard did your actions reach? Because this should be your personal measure of the type of outcomes you are aspiring for. So before you start demanding or expecting anything from anyone, look at whether you have fulfilled your part completely. Mull over all the group meetings you held, and look back at all the discussions you had with your subordinates, peers, or bosses. How was your approach? Did you give it your all? How connected, sincere, and engaged were you? Before you ask your subordinates to take care of a certain request, do you provide the necessary

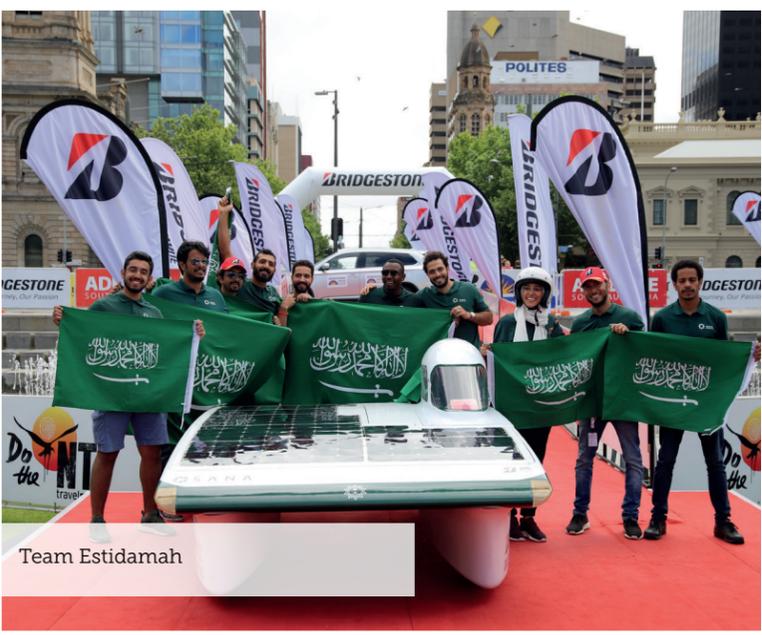
tools for them to deliver? Before you ask your manager for an approval, do you give him or her the right reasons to go through with it? As you’re looking back, be honest. Put yourself on the spot and reflect. Not from time to time, not even on a daily basis, but reflect now and every single time you make a decision or take any action that has an effect.

It’s worth noting, though, that engagement goes beyond self-reflection. People naturally want to build relationships with their spouse, children, families, and friends. Well, we’re a family here, too. A family of colleagues, team work, and group effort. And employees who truly feel this way aspire to add a human element and connection to every single thing they do. These people don’t wear Engagement to work, they radiate Employee Engagement from within! Here are a couple of reasons why we should aspire to become highly engaged employees, as highlighted by the leading global Employee Engagement expert, David Zinger: “We will leave work each day with a stronger sense of satisfaction”, “Our engagement will rub off on customers and clients and will find that customers and clients are easier to work with”, “We prevent ourselves from becoming disengaged victims—seeing the company as the enemy, leaders as villains, and being unhappy with our lot in life”, and “We tend to also be more engaged in things outside of work when we are fully engaged with work”.

You might have noticed that I didn’t dig into what strategies organizations are implementing to address Employee Engagement, or that I haven’t listed any best practice approaches or frameworks. It’s because I want the focus to be you! The strategy for addressing Employee Engagement in this piece is Self-Reflection. So to make sure I end with some food for thought, go back to your first impression of when you started reading this piece. Has it changed? Has it stayed the same? I hope that in both cases, you start reflecting on yourself from this moment onwards. Because the least that could possibly happen, is you become more engaged.



# FROM THE LAND OF OIL... A SOLAR CAR



This October, team Estidamah competed internationally in a Saudi-made race car that operates completely on one of the Kingdom's most abundant natural resources... the sun.

Estidamah Solar Car team was established by Sustainable Innovations, a company that aims to become a leading organization in renewable energy and an incubator for innovative product development in Saudi Arabia and the Arab world.

Sustainable Innovations was established in 2016 and is based in Al-Khobar, the Eastern Province of Saudi Arabia. The company strives to create a flourishing environment for the development of innovative solutions into products that contribute to the Kingdom's knowledge-based economy. Subsequently, the company's Saudi-based manufacturing and product development ecosystem is fully aligned with the goals of Vision 2030 and aims to contribute in overcoming one of the main challenges addressed by the National Industrial and Development & Logistics Program (NIDL): Enhancing local product development capabilities and the establishment of local product suppliers.

With a commitment to applied innovative engineering and sustainability, Sustainable Innovations established the Estidamah Solar Car team who designed and built "Sana", an electric race car operating solely on solar power that competed in the 2019 World Solar Challenge. The car is covered by 4 meters squared of solar panels, which can produce 1 kWp by converting solar energy into electricity that feeds the motor. Sana is equipped with an electrical motor with an efficiency of 99.2%, 20kg of lithium-ion batteries with a capacity of 5.4 kWh and an aerodynamic design that has less friction with air than the side mirror of regular car. At a speed of 100 kph, Sana consumes 1100 Watts per hour, which is less than the consumption of a water heater.



The World Solar Challenge was established in 1987, takes place in Australia every two years and is the largest international solar car race. The race aims to test the efficiency and endurance of the solar cars as they cross a 3000 km trail that starts from Darwin, north of the Australian continent, down to Adelaide in the south, through the Australian outback. The race mainly aims to create a competitive environment for the testing and development of innovative renewable technologies. On Sunday October 13th, the solar race cars began their journey from North to South of Australia, traveling through the harsh desert environments in five days and allowed to only drive from 8 AM to 5 PM daily. In the 2019 World Solar Challenge, Estidamah team came in 24th place amongst 44 teams from 24 different countries. With that result, Estidamah aims to come back with a stronger team and a more ambitious goal and continue to represent the Kingdom in upcoming solar races.

The manufacturing of Sana was made possible through the support of ACWA Power, Saudi Investment Development Fund (SIDF), King Abdulaziz City for Science and Technology (KACST) and Badir Program for Technology Incubators, who took the initiative of advocating a team of Saudi youth in the localization of industrial development and representing the Kingdom in the largest and most prestigious solar car race in the world.

If you have the technical knowledge and passion to become a part of the team, you can contact Estidamah Solar Car team via:

**Email:** [contact@estidamah.sa](mailto:contact@estidamah.sa)

Follow Estidamah's social media accounts to keep an eye on Sana's development journey and preparation for the upcoming races:

**Twitter:** [@Estidamah](https://twitter.com/Estidamah)

**Instagram:** [@Estidamah.sa](https://www.instagram.com/Estidamah.sa)



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**Syed Haider**

PhD Student, King Abdullah University of Science & Technology (KAUST)



technology is proving itself to be useful in every sector of the industry, i.e. upstream, midstream, downstream, and business operations.

An offshore platform running 24/7 delivers only 77% of its maximum operational potential. This happens due to various technical problems at the rig such as, but not limited to, drill bit failure and lost circulation. This loss of time, when there is no useful planned operation, is called the non-productive time (NPT). Typically, NPT can account for around a third of overall drilling expenses. Machine learning algorithms are playing an essential role in predicting NPT because of operational failure and saving companies millions of dollars annually. The vast amount of performance data collected by field sensors like motor temperature, motor rate, pump pressure, flow rate, downhole temperature, vibration, etc. are used to find discrepancies between the current state and the ideal state of performance. Unusual performance readings send an alert to the operators to conduct preventative maintenance, thus improving operational efficiency and reducing costs. A successful example by Saudi Aramco is the DrillCam tool that processes the image feed ahead of the drill bit and makes real-time geo-steering adjustments, which saves expenses in the field.

In the midstream sector, machine learning has reduced the work load of field inspection teams. Thousands of images of the pipeline system captured via advanced drones are processed using image recognition algorithms. Image analytics help in identifying corrosion and pipeline damage without the need for field personnel visits. Real-time monitoring improves the assessment of infrastructure integrity, thus reducing inspection costs. For example, CRUX OCM, an AI startup, uses advanced

# ARTIFICIAL INTELLIGENCE IN OIL AND GAS INDUSTRY: APPLICATIONS AND FUTURE

You log in to your Netflix account, and the first thing you see is a new movie trailer on your home screen, and you end up loving it. That's not a coincidence, that's the power of machine learning and data analytics in our day to day lives. Our interest is predicted accurately, and the options are presented accordingly. The applications range from trivial things like user-customized news and advertisements to advanced technologies like self-driving cars and real-time electricity consumption optimization in Google's data centers.

With this new power in hand, technology is improving rapidly and Artificial Intelligence (AI), along with the 4th Industrial Revolution (4IR), are transforming the oil industry globally. The competitive price war in the energy sector is forcing oil and gas (O&G) companies to focus more on increasing operational efficiency and making better business decisions. Large-scale discoveries have become rare, and the existing ones need optimization at all levels (operations to management) to reduce costs. As a result, effective collaboration between oil and gas companies and AI research groups is expected to create an AI market potential of US\$2.85 billion by 2022. With the capability to process large amounts of real-time data and highlight hidden patterns in the operational and business processes in order to predict the near future,

data analytics on real-time pipeline sensor data to activate automated pipeline commands on behalf of the control room. Additional sensors also track real-time pipeline leakage. AI is also showing effective results in the oil distribution and logistics sector. Advanced analytics are being used to create the optimized fleet route with minimum downtime. All of these measures save millions of dollars annually.

In the downstream sector, the combination of Internet of Things (IoT) and machine learning algorithms have changed the whole process of managing a petrochemical plant or refinery. There are sensors in motors, pumps, electrical circuits and other operating equipment in a plant. The data collected from these sensors is stored and processed in the cloud to assess overall efficiency. Processed data helps in deciding the strategy for optimized power consumption. It also helps in simulating the best operating conditions for different machines for longer life and longer runtime. Another successful execution is the Knowledge-Search platform. The platform reads thousands of reports, text files and documents and uses Natural Language Processing (NLP) to give businesses and operations insight from the vast amount of unstructured data. For example, with the help of predictive maintenance, if a supervisor knows that a particular equipment is going to fail, the Knowledge-Search platform can then show different ways in which the problem was solved previously along-with the corresponding outcomes. This approach gives instant insight into the problem and minimizes unnecessary time and effort spent going back and forth through previous reports. Eventually, the supervisor can select the most suitable track to solve the problem.

The amount of available data is enormous with colossal usage possibility. Using AI on subsurface data primarily for the exploration phase, e.g., seismic interpretation, fault interpretation, lithology analysis, and filling the gaps of missing data is still under testing and development. There is a lot to learn before we have fool-proof algorithms for the cases mentioned above. Fundamentally, the foremost requirement is human intelligence.

Algorithms won't make sense in the absence of scientists and engineers who have a proper understanding of the physical laws and business logic. Embracing an AI-led digital future, with the trained workforce, can and will unlock tremendous potential in areas of exploration, production, and management. Mundane and repetitive tasks overtaken by machine-driven intelligence will, in fact, downsize unnecessary workforce. But, at the same time, it will unlock new data science and AI-related job opportunities best-suited for the industry to grow.

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**Dr. Ahmed H. Altayyar**

Consultant of both Occupational Medicine and Internal Medicine Johns Hopkins Aramco Healthcare (JHAH)



# PREVENTING DISABILITY BY Enabling the mentally or physically impaired

*Dr. Altayyar is a fellow of the Royal College of Physicians and Surgeons of Canada in both Occupational Medicine and Internal Medicine. He holds a Master of Science in Engineering and Management, Systems Design and Management from MIT.*

More than half a million Saudi citizens (1 in every 30 people) reported a disability in 2016, according to a Saudi National Survey.<sup>1</sup>

The prevalence of disability globally varies from 1 to 30 percent, and it is estimated that the prevalence of disability is approximately 15 percent globally. Severe disability prevalence is estimated to be approximately 3 percent. However, accurate estimates of prevalence in the kingdom are lacking.

This article will shed light on the important distinctions between the terms “impairment” and “disability.” “Impairment” is defined as a disorder that causes alteration of a body function or structure, while “disability” refers to limitations resulting from impairment in the ability to perform activities of daily living or more complex activities such as work. Additionally, impairment is irrespective of the environment, i.e., not defined relative to the environment.

The United States Social Security Administration defines disability as “the inability to engage in any substantial, gainful activity by reason of a medically-determinable

physical or mental impairment(s), which can be expected to result in death or which has lasted or can be expected to last for a continuous period of not less than 12 months.”<sup>2</sup>

Disability, in contrast to impairment, actually takes away from the person’s ability to function in a specific environment. Disability is the inability to engage in complex or gainful activity due to physical or mental impairment. It directly impacts the interaction between the impaired individual and the environment in which he/she functions.

As an example, impairment is present in a person who has a herniated disc with intermittent shooting pain down the lower limb, regardless of whether the individual is active at work or relaxing at home. This is otherwise known as radiculopathy. A person with degenerative disc disease and sciatica is likely to be considered disabled when it comes to work that requires manual labor but may be deemed to have little or no disability at all as an administrative clerk functioning as an office worker or while functioning at home.

Definitions of disability commonly convey that disability incorporates the interaction of impairment with its functional impact on the individual’s ability to participate in a particular life situation or activity. Impairment is, “A significant deviation, loss, or loss of use of any body structure or body function in an individual with a health condition, disorder or disease.”<sup>3</sup> Disability, as a result, is, “An alteration of an individual’s capacity to meet personal, social or occupational demands or statutory or regulatory requirements because of an impairment.”<sup>4</sup> The presence or absence of accommodations at home

or work contributes significantly to the impact of an individual’s disability in a given setting. “The risk of a work-related injury is highest in manufacturing, construction, natural resources and mining, education, and health services. Highest-risk industries for occupational fatalities continue to include construction, agriculture, forestry, fishing, hunting, transportation, and warehousing.”<sup>5</sup>

The role of the clinician in disability evaluation is to define and document findings related to the individual’s medical problems and associated functional limitations and to collate information from different sources into a coherent picture of the individual’s medical conditions and functional ability. This task of determining and assessing disability can be significantly challenging at times and may require specialized training and experience. Occupational Medicine Consultants are usually exposed to training in disability assessments and are, consequently, valuable assets in providing independent medical examinations and disability assessments.

It is, in my humble opinion, our duty as a society to decrease the impact of disabilities by actively empowering and integrating people into the workplace and decreasing the burden of disability by enabling those with different types of impairments. This is done through adopting innovative ways of modification to the workplace and in public sectors and home settings, in addition to instilling more independence amongst those with impairments to prevent the impairments from disabling the people.

The Kingdom of Saudi Arabia has done much with regards to enabling people with disabilities on multiple fronts, from policy to education and awareness and active integration into both public and private sectors. However, there remains a lot more to be done to tackle disability in the Kingdom. An important aspect is to support studies on disability and further incentivize both public and private sectors to enable people with disabilities. This will form a wholesome productive community that harnesses the power of the individuals who make up the population of the Kingdom of Saudi Arabia.

Let us support the people of determination and prevent disability by accommodating and enabling those faced with impairment, whether it be mental or physical, by creating a culture and physical environment that enables them rather than disables them both at work and at home, in both private and public sectors and everything in between.

**About Inclusion and Diversity at Johns Hopkins Aramco Healthcare (JHAH)**

August 2019 - JHAH CEO, Dr. Daniele Rigamonti, publicly shared his commitment to providing an inclusive, adaptive environment for everyone, including patients, families, visitors, and employees in an open letter to the media.

The JHAH strategy is aligned with the Kingdom’s Vision 2030; striving to enable everyone, including persons with disabilities, to be integrated and independent. JHAH has established a Person-Centered Care (PCC) committee and a sub-committee for Persons with Disabilities (PwD) to facilitate its cultural transformation and make it sustainable. JHAH is determined to provide an accessible, inclusive environment that provides suitable education, job opportunities and staff retention without discrimination.

**For more information contact: [PWD@JHAH.com](mailto:PWD@JHAH.com)**

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# USEFUL RESOURCES

BY AHMAD ISMAIL

Petroleum Engineer, Saudi Aramco



## WEBSITES



### EDX



edX is a massive open online course provider. It hosts online university-level courses, some at no charge at all, in a wide range of disciplines to a worldwide student body. More than 70 schools, nonprofit organizations and corporations offer or plan to offer courses on the edX websites. edX offers thousands of courses and has millions of students.

## SOFTWARES



### TABLEAU



Tableau is an interactive data visualization software. It helps in simplifying raw data into an easily-understandable format. Data analysis is very fast with Tableau and the visuals created are in the forms of dashboards and worksheets.

**Main Features:**

- Data blending
- Real time analysis
- Collaboration of data

## YOUTUBE CHANNELS



### CRASHCOURSE

CrashCourse, an educational YouTube channel started by John and Hank Green, has accumulated over 9.9 million subscribers and 1.1 billion views. To date, there are 38 main series of Crash Course, including:

**Main Features:**

- Business Entrepreneurship
- History of Science
- Engineering
- Astronomy



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