Hackathon 2021

under the patronage of

Ministry of Oil - Kuwait

is proud to organize

Hackathon'2021

A unique competition to develop innovative digital solution to Kuwait's oil and gas challenges using the industry's leading IIOT Edge Gateway – Agora.

Who can participate?
-Teams of students from various prestigious academia across Kuwait
Kuwait University, Public Authority for Applied Education & Training, American University of the Middle East, Australian College of Kuwait, American University of Kuwait
- Recent Graduates that are either unemployed
or employed in other than oil sector (less than 5 years).
-Ministry of Oil Employees
-Employees of Kuwait Oil Company, Kuwait National Petroleum Company, Kuwait Gulf Oil Company, Kuwait Institute for Scientific Research

When
Registration 28th March 2021 – 25th April 2021
Hackathon Challenge 26th April 2021 – 30th May 2021

About the competition
Edge intelligence is set to transform oil and gas operations including reducing downtime, HSE exposure, lower operating costs and enhancing production.

Opportunity to do Internship with Schlumberger (University Students & Recent Graduates)
1 Week Training Program (Working Professionals)

Competition Outline

Teams of students from various prestigious universities across Kuwait along with recent graduates & professionals who have joined Oil Industry would be required to develop user friendly apps that can be easily added to AGORA – which is an open, secure and scalable platform enabling oil and gas industry to connect physical assets to the digital world. The aim of this Hackathon is to address E&P industry challenges by using very simple API interface of AGORA.

At Schlumberger, we believe in bringing together Academia, E&P Companies and Technology Providers on a single platform to create value for our industry. We all need to collaborate to prepare the oil industry of the future.

The Hackathon is divided into 4 groups with 3 challenges.

Following are the challenges/problem statements for the teams inside each group to work on.

Group A: <u>Students of different universities (Challenges 1 or 2)</u>

Group B: <u>Professionals employed in KPC subsidies & Government Research Centers (Challenges 1 or 2)</u>
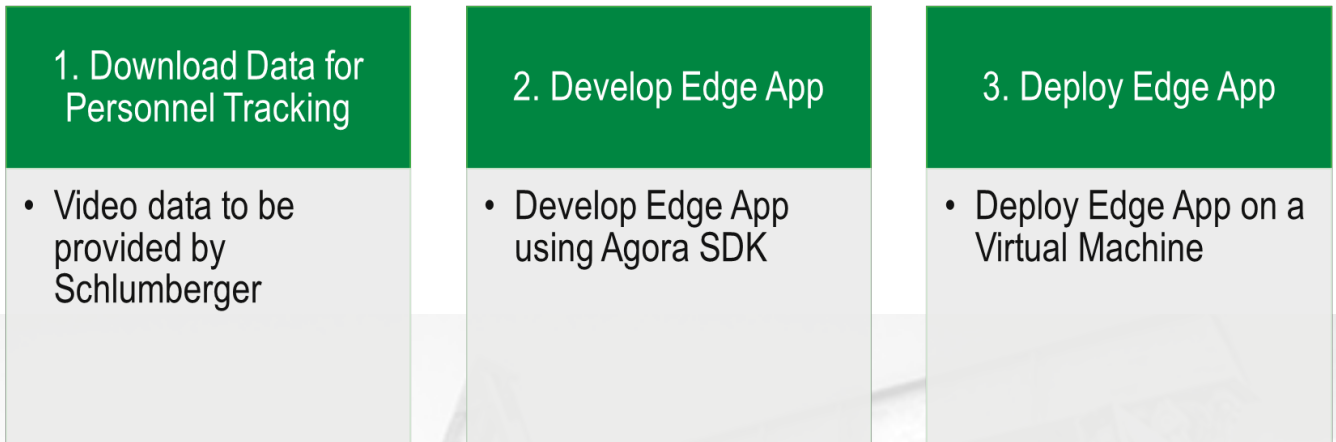
Group C: <u>Ministry of Oil (Challenge 3 Only)</u>

Group D: <u>Un-Employed Fresh Graduates or employees of <5 years seniority in a non-O&G Industry related company (Challenge 1 Only)</u>
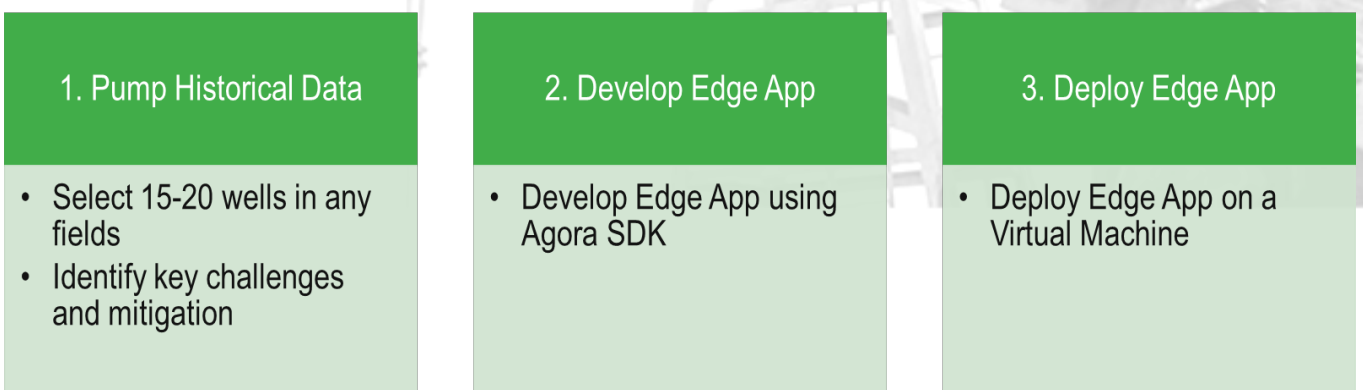
Challenges

1. <u>Personnel Tracking Using Video Analytics</u>: Oilfield operations are in different risk zones. The Covid-19 pandemic has added another level of hazard. Advancement in video-based analytics can be deployed for automatic identification of problem areas during operations. Edge applications based on video analytics can be deployed for automatic
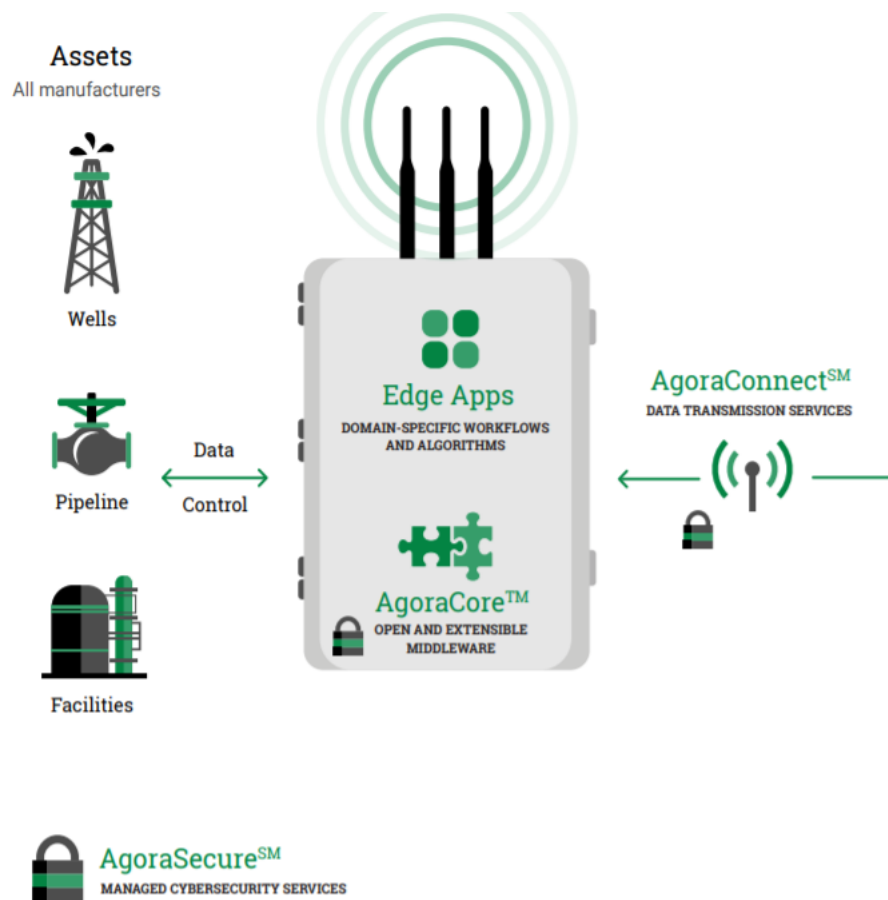
identification of hazards and as such this will be the problem statement offered during the hackathon. Schlumberger will provide a video to the potential candidates to work on developing the Edge application. This is further illustrated in the below figure.

1. Download Data for Personnel Tracking	2. Develop Edge App	3. Deploy Edge App
• Video data to be provided by Schlumberger	• Develop Edge App using Agora SDK	• Deploy Edge App on a Virtual Machine

2. <u>Surface & Subsurface Pump Health Monitoring</u> Any failure often leads to increased cost resulting from additional workover and replacement of the pumps coupled with a loss in production. As such enhancing the run life of pumps is critical and reduces the number of interventions. KOC has been acquiring pump performance data for several years and as such has a repository for such data. This sensor data set can be organized for a group of 15-20 wells within a certain cluster in an asset to identify potential problems and mitigation procedures. These will then be included in an Edge App which can be deployed at the Edge using the Agora platform. The below graphic illustrates this idea.

1. Pump Historical Data	2. Develop Edge App	3. Deploy Edge App
• Select 15-20 wells in any fields • Identify key challenges and mitigation	• Develop Edge App using Agora SDK	• Deploy Edge App on a Virtual Machine

3. The different departments working in the Ministry will have a unique challenge. They must come up with the Best Dashboard design that can be used to monitor information across all Kuwait on a single platform. The teams must come up with a graphic view of what data sets should be represented, source of data and automation program.

Hackathon Process:

1) **Data Gathering:**
    a. For Challenge 1 (Personnel Tracking using Video Analytics), Schlumberger will provide a video that can be downloaded.
    b. For Challenge 2 (Health Monitoring of Surface & Sub-surface Pumps), 15-20 well sensor data and provide to all for the app to be developed
    c. For Problem Statement 3, is a free input

2) **Software & Hardware:**
    a. The Software Development Kit (SDK) will be provided by Schlumberger. Detailed instructions on downloading the same will be provided to the registered Teams
    b. The instructions will also include minimum Hardware configuration needed to deploy the SDK.
    c. Participants will have to use their own Hardware

3) **Duration:**
    a. Registration 28th March 2021 – 17th April 2021.

b. Data gathering/downloading and Hackathon Challenge Start 18th April 2021 to 23rd May 2021.

4) **Administration:**
   a. Group A Should form a Team of three people, ideally a combination of Computer Engineering/Science, Petroleum, and Mechanical/Electrical/Civil disciplines.
   At least one team member must be from Geoscience or Petroleum engineering background.
   b. Group B Should form a Team of three people, ideally from different disciplines.
   c. Group C Should form a Team of three people from MOO employees.
   d. Group D recent graduates Should form a Team of three people, ideally a combination of Computer Engineering/Science, Petroleum, and Mechanical/Electrical/Civil disciplines.
   At least one team member must be from Geoscience or Petroleum engineering background.
   e. The Team must register with the Team Name, along with the relevant members, Civil ID, Student ID, and Employee ID as the case may be. Registration form will be online
   f. Following the hackathon, each team will present their outcome to a team of panelists.
   g. The award criteria are based on the developing the solution, creativity and techniques used to arrive at the solution.
   h. Mentoring will be provided to participants. A web-based helpdesk interface will be provided.

5) **Award:**
   a. All winners will be recognized by the Ministry and will be awarded Agora Boxes to continue development.
   b. Group A :
      i. Top 2 Teams will be awarded Internships (total 6) in Schlumberger, in 2nd year and 3rd year, and based on performance will be provided an opportunity towards a career in Schlumberger.
   c. Group B :
      i. Top 2 Teams will be awarded 1-week training program in one of the Schlumberger Learning/Training Centers on Digital Innovation in the Oil Industry
   d. Group C :
      i. Top 2 Dashboard designs will be awarded with training sessions on industry challenges by Schlumberger Kuwait domain experts.
   e. Group D :

   i. Top project will be awarded an Internship with Schlumberger, based on performance will be provided an opportunity towards a career in Schlumberger.

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