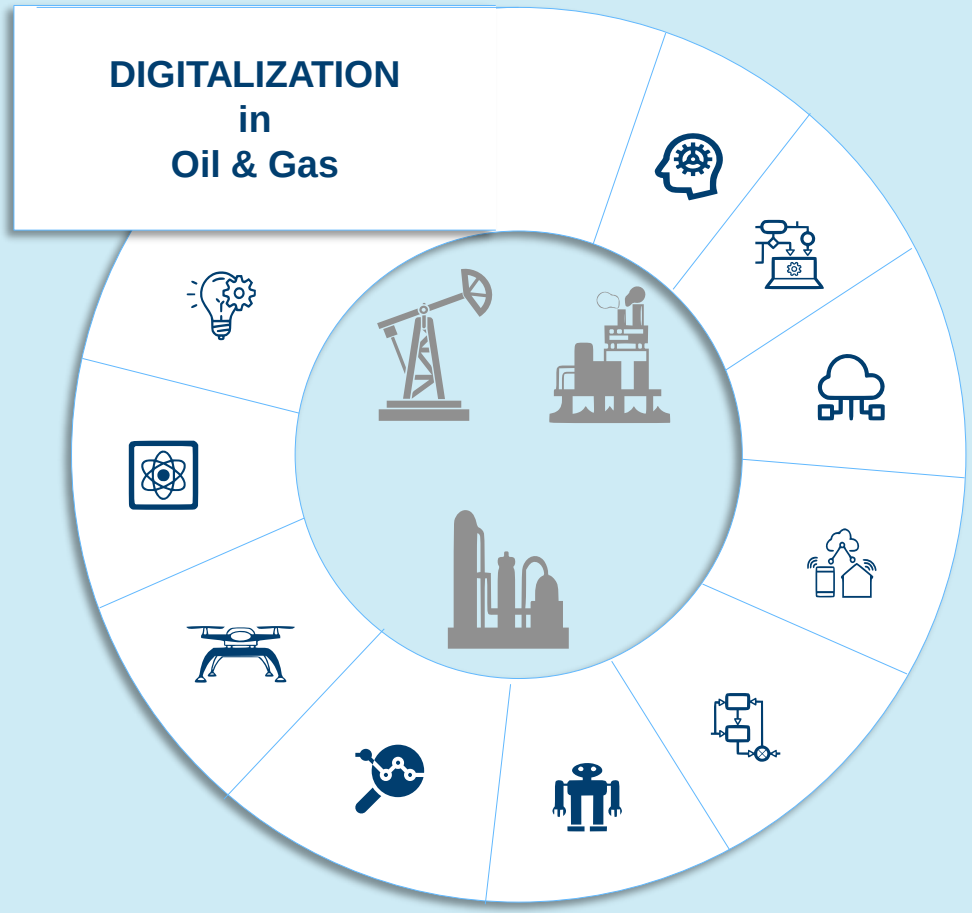
Special Report

Front Runners in Oil and Gas Digitalization

2022



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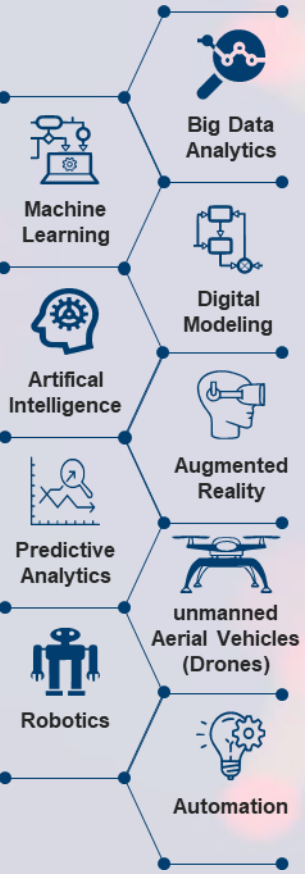
Over the years, role of digital technologies has shifted from providing marginal efficiency to being a catalyst for innovation and disruption



In past few years, various technologies to enable digitalization (such as smart sensors, drones, remote operating vehicles and robots, cloud computing, AI/ ML, among others) have successfully achieved proof of concept. In current scenario, industries are trying to assess the impact of digitalization on their production, operations, management, business models and are customizing these enablers, as per their requirement.

Oil and Gas (O&G) industry also eyes a huge potential with digitalization, in order to:

- ✓ **Automate and optimize operations at all stages of the value chain (exploration, extraction, refinement, storage, transportation and distribution)**
- ✓ **Optimize production based on demand analytics, taking timely decisions based on the real time data**
- ✓ **Minimize breakdown and optimize MRO cost**
- ✓ **Remotely monitor and control their assets, ROVs in real time; and**
- ✓ **Improve safety of assets and employees with data analytics and dynamic barrier management.**

Overall, digitalization can assist O&G industries in sustainable management of resources and in running safer and cost-effective operations.

Report Overview

About this report:

- This report aims at providing a comprehensive overview of leading start-ups providing digitalization technologies for Oil & Gas industry. Following are the key types of start-ups covered:
  - **Operating technology providers:** Physical equipment (e.g., machines and sensors) and associated digitalization technologies for data conversion
  - **Robotic technology providers:** Robots and drones for remote monitoring and maintenance
  - **Advanced computational and simulation technology providers**
- Well established companies, conglomerates, research institutions and laboratories have not been captured in this report.
- Each company profile outlines the technology, financials, targeted market and intellectual property of the player. Further, a 20-point assessment within Aranca 5 Factor Assessment Framework has been provided for each player.

Relevant audience:

- ✓ Established companies and conglomerates willing to explore and acquire certain start-ups
- ✓ Venture capitalists (VCs), institutional and individual investors
- ✓ In general, Oil & Gas companies looking at adopting and implementing digitalization technologies

Customization:

- ✓ Report contents can be customized based on user requirements. Accordingly, report coverage shall be reduced or expanded to the specific areas of interest.

Report Overview

50 companies actively working in digitalization of oil and gas industry

Inclusion of companies working in oil and gas upstream, midstream and downstream operations

Holistic assessment in terms of IP, technology, financial, ecosystem and organization

Entities range from start-ups to potential disruptors*

In depth analysis and key observations for each entity

Information covered on each company

Company information

- Website, year of establishment, headquarters, key personnel, etc.
- Size (employee count, revenue, funding, etc.)
- Awards and recognition

Technology

- Technology scalability
- Patents and research collaborations

Commercialization

- Applications and markets
- Business partnerships, investments

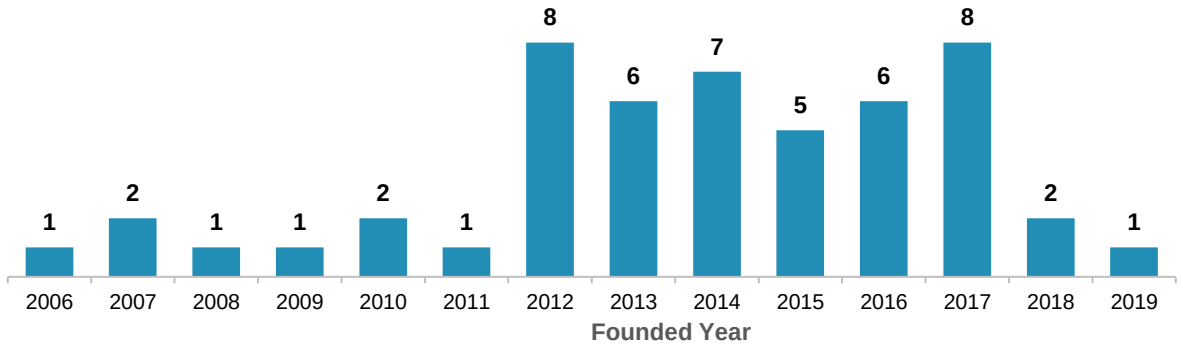
** Players with diversified business portfolio are excluded; Joint Venture and Partnerships, Established Players and Conglomerates shall be provided in a list format*

Highlights

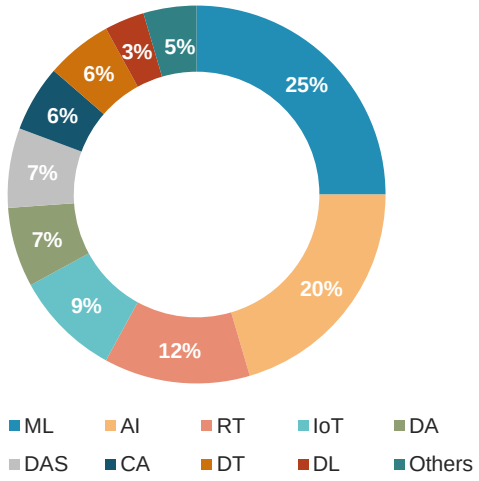
Summary

Companies covered	50
Geographic focus	Global
Year of establishment	2006 onwards
Digitalization Technology	AI, CA, DA, DAS, DTS, DT, DL, IoT, ML, Img, ML, RT
Application	Advances in drilling, Artificial lift optimization, Asset simulation, Data interpretation, Predictive maintenance, Production optimization, Remote monitoring, Robotics

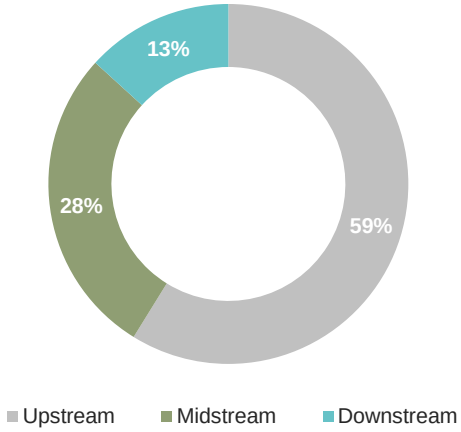
Companies by maturity



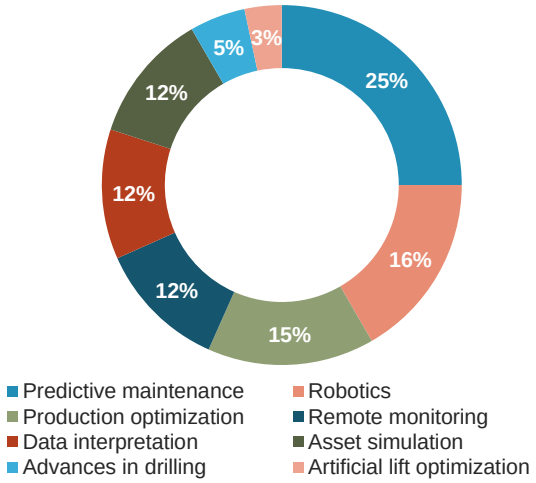
Technology



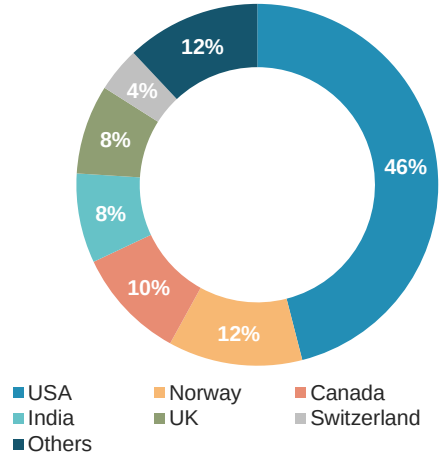
Operation

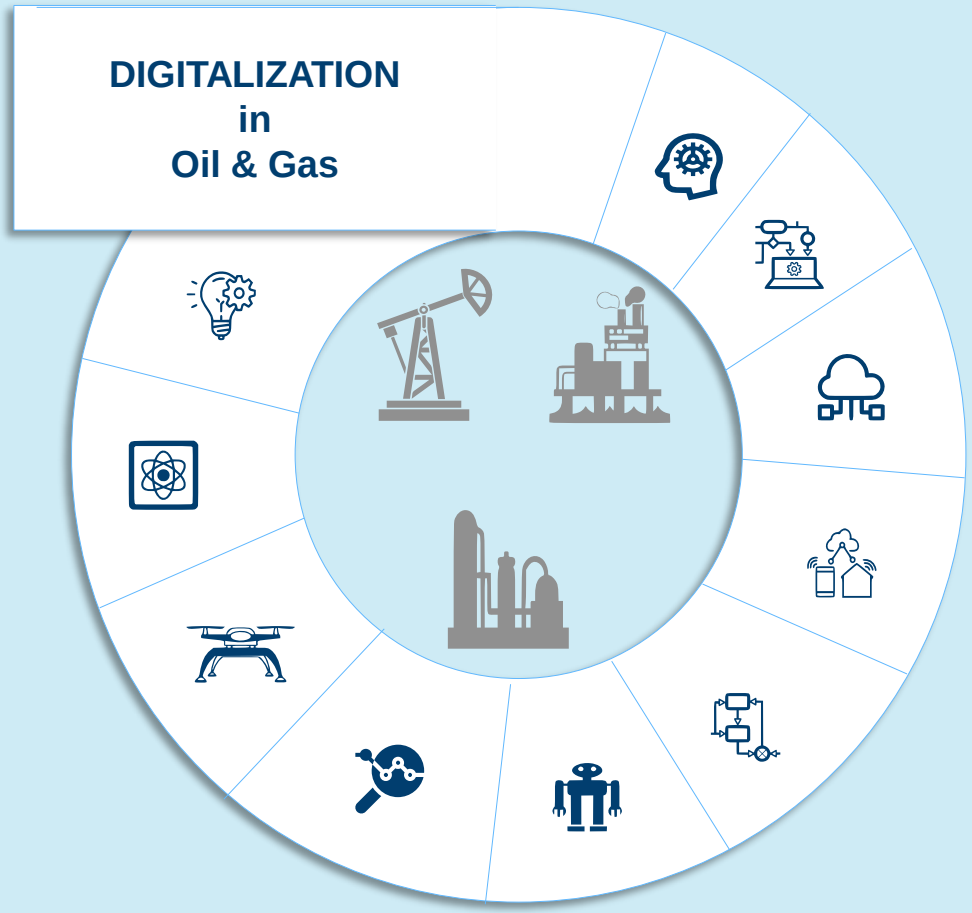


Application



Regional coverage





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Research Methodology

Methodology

- A comprehensive search was performed on various platforms to map the relevant technology developers. Mapped entities were scrutinized for relevancy based on technology and product offerings.
- Corporate players and entities with diversified portfolios with partial focus on digitalization technologies were excluded.
- Focused secondary research was conducted for the relevant players in order to capture relevant information. In order to fill the gaps existing after this, primary research was conducted wherever necessary.
- Entities with establishment year 2006 onwards have been considered, however, this has not been considered strictly in order to capture all significant players.
- Each relevant player was evaluated on five important factors namely intellectual property, technology, financials, ecosystem and organization.

Information Sources

Following paid and public sources of information were referred (not exhaustive):

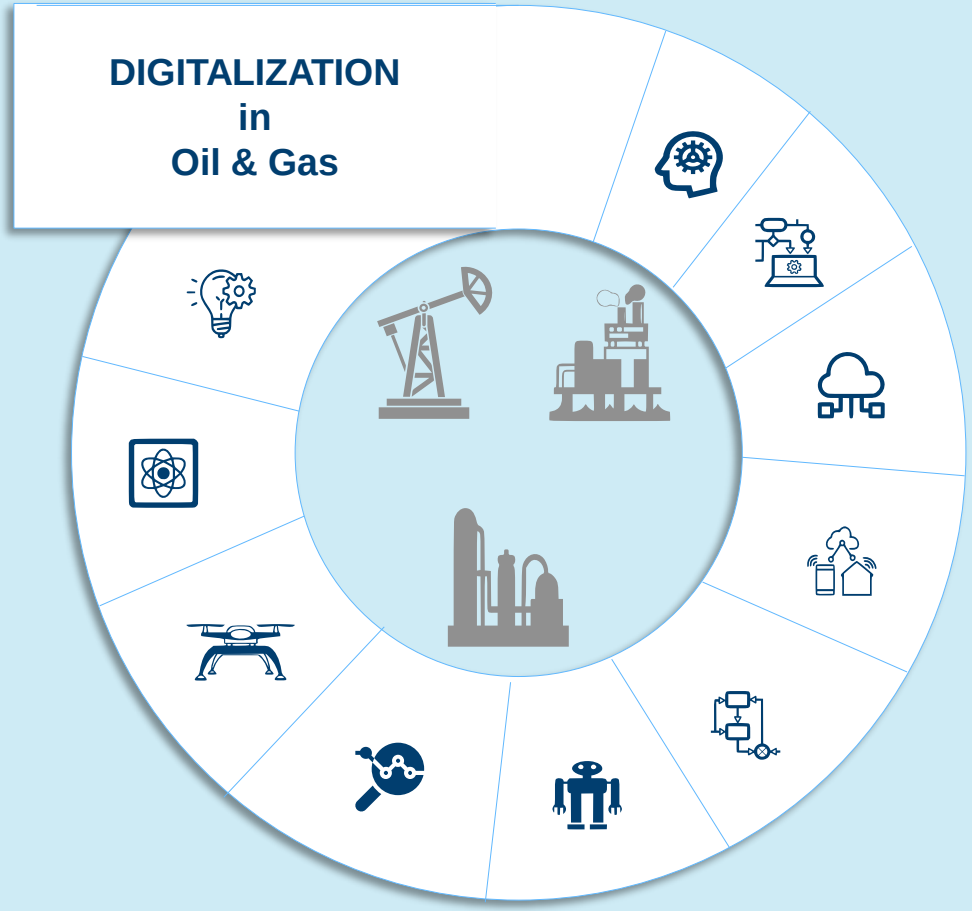
- Patents on databases such as Thomson Innovation and Questel Orbit
- Scientific literature published on databases such as ScienceDirect, IEEE, Google scholar, SpringerLink and Ei Compendex
- Company websites, product brochures and news/media sections
- Industry associations and Government sources such as IEA (International energy association), IOGP (The International Association of Oil & Gas Producers) etc.
- Specific publications/magazines on O&G digitalization
- Other commercial databases such as Factiva, Crunchbase, Pitchbook, Bloomberg and EMIS to capture/validate company-specific information
- Aranca internal knowledgebases and industry experts

Aranca Assessment Framework

Factor	Parameter	Score (1−5); higher is better					Min	Max
Intellectual Property	No. of Patents						2	10
	Patent Status							
Technology	Scope						2	10
	Scalability							
Financials	Total Funding						5	25
	Funding Rounds							
	Type of Investor							
	No. of Investors							
	Revenues							
Ecosystem	Environmental Impact						1	5
Organization	Global Presence						5	25
	Employee Size							
	Active Years							
	Partnership							
	Awards/Recognition							

Notes:

- Total score is obtained by adding the individual factor scores.
- For uniform representation, final score is normalized on a 0-100 scale and factor scores are adjusted accordingly.



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sparkcognition

Website: Link
Est.: 2013
HQ: USA

SparkCognition has developed AI based solution for oil and gas industry. The system learns from data to understand operational states and failure modes of assets and uses intelligence to warn of impending asset failures. Company has developed different products like SparkPredict^{R}, DeepArmor^{R}, Darwin^{TM} and DeepNLP^{TM} with their application in different industries.

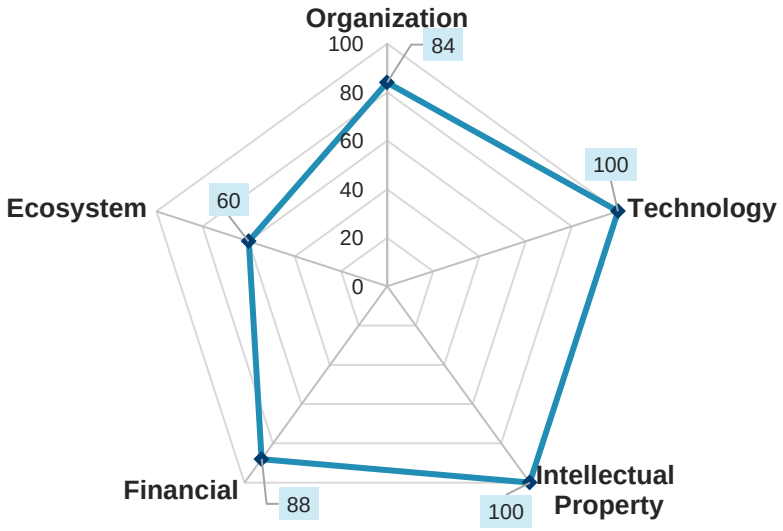
Solution
- Technology: Artificial intelligence
- Application: Predictive maintenance
- TRL: Full commercial application

Financials
- Total revenue: $ 10 to 50 mn
- Total invested amount: $ 163 mn
- Investors: Private (Series C)

Operations
- Head quarters in USA
- R&D center in Brazil
- Offices in Brazil and UAE

Applications
- Oil and gas
- Aviation
- Defense
- Financial services

Aranca Assessment 65/75



Note: Scores have been normalized on a 0-100 scale. Detailed analysis has been provided in the next slide.

Aranca Observations

- SparkCognition has been providing solutions on predictive maintenance and endpoint security services based on cognitive AI to different companies
- SparkCognition is looking to spread its operations using the recent funding received

Overall Rating

★★★★☆

sparkcognition

Aranca Assessment

Total Score **65**

Factor		Criteria	Low 1	2	Score 3	4	High 5	Total
Intellectual Property	▪ Strong IP portfolio of 82 patents, out of which 32 are granted	No. of Patents						10
		Patent Status						
Technology	▪ Company has developed automated model named Darwin, which creates dynamic, accurate models ▪ SparkPredict is an predictive analytics solution for equipment maintenance	Scope						10
		Scalability						
Financial	▪ Ample funding available from Private investors ▪ Recent funding round was promising with investments of $ 100 mn	Total Funding						22
		Funding Rounds						
		Type of Investor						
		No. of Investors						
		Revenues						
Ecosystem	▪ Significant reduction in energy consumption with lesser downtime events	Environmental Impact						3
Organization	▪ SparkCognition has a employee count of nearly 300 members ▪ Currently company is exploring opportunities in new markets	Global Presence						21
		Employee Size						
		Active Years						
		Partnership						
		Awards/Recognition						

SparkCognition is one of the leading solution providers in cognitive artificial intelligence, with current economic and technological advances it can further become a market leader

Patents

- Total of **82 patents,** out of which 32 are granted
- The patents speak about efficient generation of neural networks with automated model building process
- Patents are based on a system and method to develop for generating heuristic capable of identifying data patterns

Financial

- The company received latest funding of $ 100 mn in **2019** from a Series C round led by March Capital Partners
- Received a funding of $ 56.6 mn in Series B funding in **2017-18**
- Initial funding of $ 6 mn was received in **2016** from Series A funding.
- Total number of 26 investments, with four leading investors

Research and Development

- Planning to expand the research group and build an integration facility in Austin, Texas (US)
- Continued plans of global expansion with recent operations in Latin America and Middle East

Collaborations and Partners

- SparkCognition has a partnership with **Aker BP**, Norwegian oil and gas firm to optimise operations enhanced with artificial intelligence (AI) applications.
- SparkCognition has a partnership with **Cendana Digital**, Malaysian data science company to expand global reach.
- SparkCognition also has partnerships with companies like **Boeing, Siemens, Hitachi high technology and others.**

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