

Career landscape in Upstream O & G: big picture view

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About me/bio

Education

- BEng in Petroleum Engineering, Baku Higher Oil School / Heriot Watt University, 2013 – 2018
- MSc in Reservoir Evaluation and Management, Baku Higher Oil School / Heriot Watt University, 2018 – 2020
- PhD in Petroleum Engineering, University of Southern California, 2021-

Industry experience

- Summer intern, SOCAR, 2015
- Summer intern, SOCAR, 2016
- Summer camp participant, Schlumberger, 2016
- Geoscience intern, BP AGT, 2017
- Reservoir Engineering intern, BP AGT, 2019

Involvement in SPE Azerbaijan

- Young Talents program, 2016-2018
- Student Symposium, 2017
- Petrobowl Finals, 2019

Motivation

- Curiosity?
- Money?
- Prestige?
- All?



Oil is crucial to the global economic framework, impacting everything from transportation to heating & electricity to industrial production & manufacturing. (Investopedia)

Career landscape in O&G: big picture view

Career options in Upstream
O&G

Operators



Services

Schlumberger



R&D: operators,
services, universities



Operator companies

Focus:

- Search & extract hydrocarbons

Types:

- IOC: international oil company
- NOC: national oil company



Operator companies

Distinguishing features

- Own / operate the field
- Hire service companies to provide specific services

Job details

- Most jobs are office-based
- More stable employment & work environment
- Better work-life balance

Skills & Interviewing

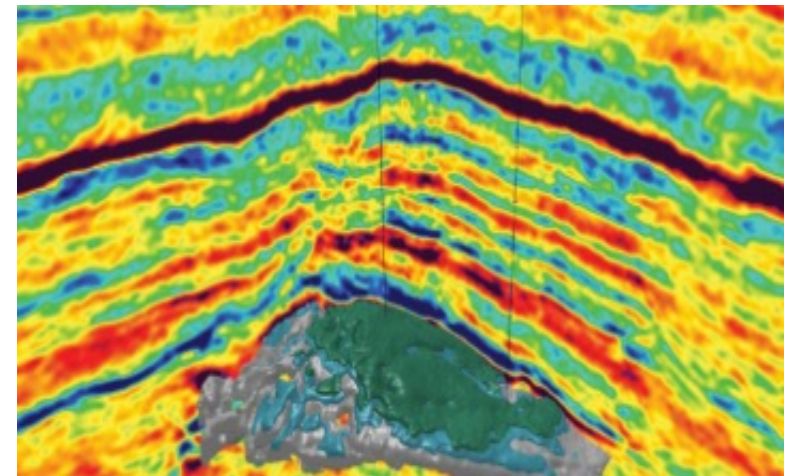
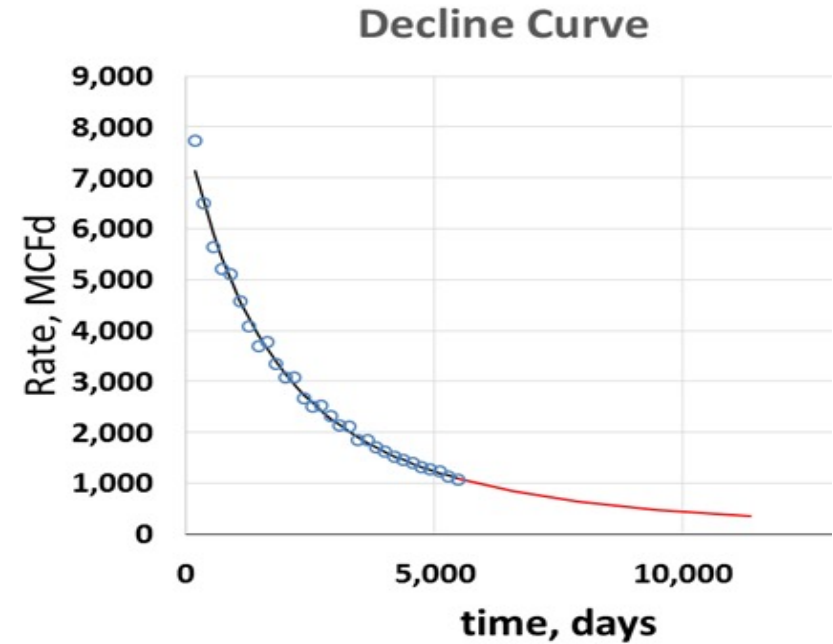
- Wider scope of work
- More transferrable & book knowledge
- More teamwork
- Domain knowledge needed for entry-level jobs



Operator companies

Core technical roles:

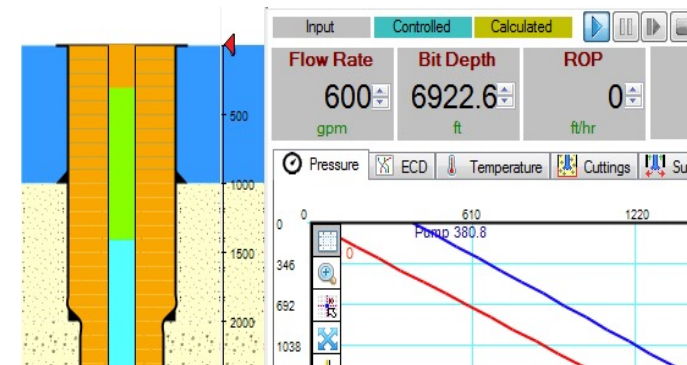
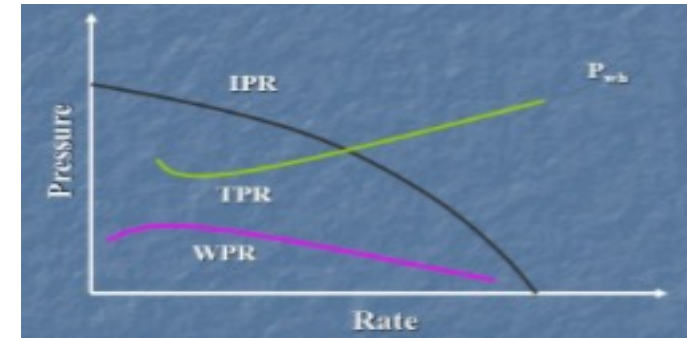
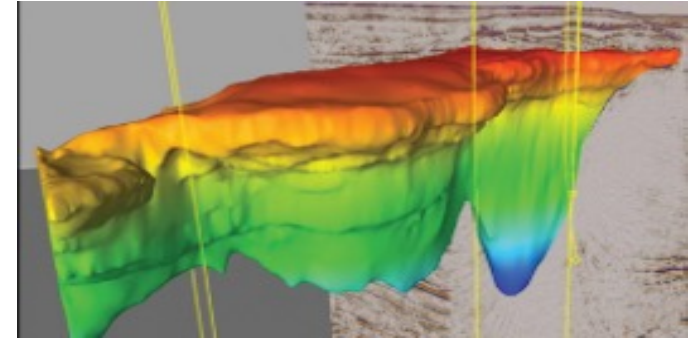
- Petroleum Engineering:
 - Reservoir engineers
 - Production engineers
 - Drilling & completions engineers
- Geosciences
 - Geologists
 - Geophysicists
 - Petrophysicists



Operator companies

Petroleum engineering roles:

1. Reservoir engineering
 - Focus on optimizing production of reservoir
 - More interaction with office people
 - More scientific & deductive work
2. Production engineering
 - Focus on individual wells
 - More interaction with operations people
 - Some office and some site work
3. Drilling engineering
 - Focus on design of well drilling program
 - More interaction with contractors
 - Some time spent at well sites



Operator companies

Geoscience roles

1. Geology

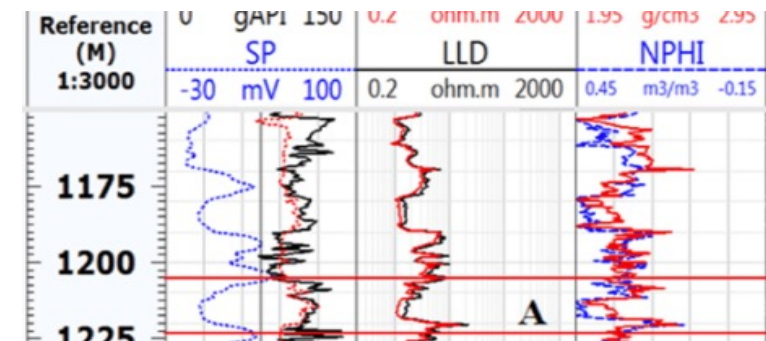
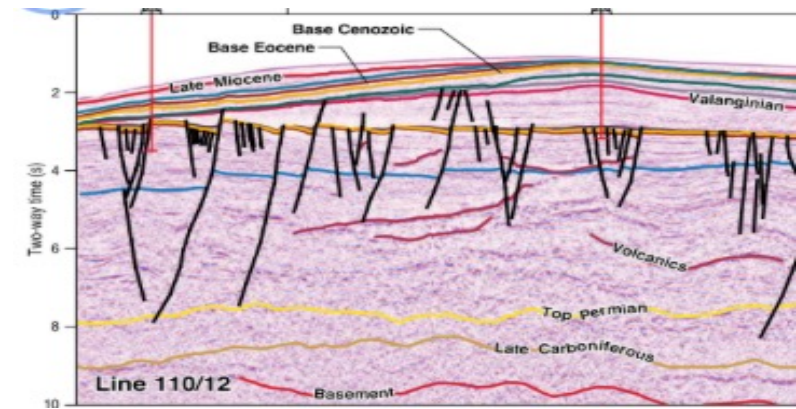
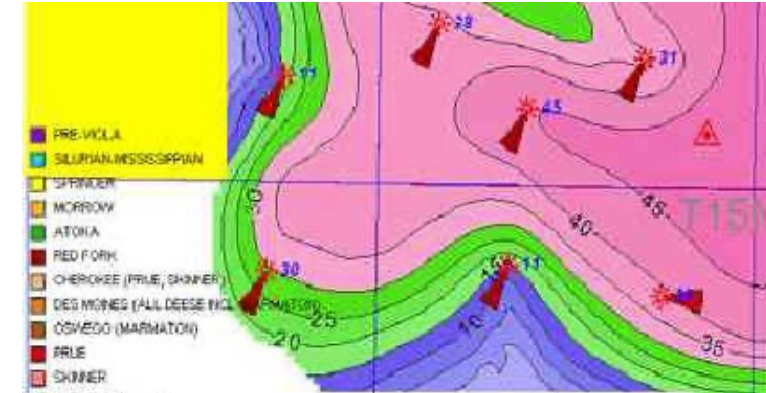
- Focus on understanding rocks
- Wide variety of responsibilities
- Main tools: outcrops, maps, direct measurements
- More observational & qualitative

2. Geophysics

- Focus on understanding physics of rocks
- More limited scope of work
- Main tools: mostly seismic data
- More analytical & quantitative

3. Petrophysics

- Focus on understanding properties of rocks
- More limited scope of work
- Main tools: well log and core measurements



Service companies

Focus:

- Provide wide range of services to operator companies
- Do not produce or sell hydrocarbons

Types:

- Big & integrated: offer wide range of services
- Small & specialized: focus on one aspect of E&P



Service companies

Distinguishing features

- Do not own the field
- Hired by operator companies to provide services

Job details & Interview process

- Most jobs are site-based
- Faster-paced work environment
- Usually, worse work-life balance

Skills & Interviewing

- Narrow scope of work
- Less transferrable & more hands-on knowledge
- Less teamwork
- Domain knowledge is not needed for entry-level jobs
- Constant training & upskilling



Service companies

Technical roles: Wide range of roles sorted by product lines

- Characterization
 - Seismic
 - Well logging
 - Well testing
- Drilling
 - Directional drilling
 - Fluids & cementing
 - Measurements while drilling
- Completions
 - Well completions
 - Stimulation
 - Artificial lift



AND MANY
MORE!!

**Except basic engineering
knowledge & intuition, no prior
knowledge is needed**

R&D

Focus:

- Basic research: acquire new knowledge for the sake of research
- Applied research: acquire knowledge with a specific goal in mind

Type of entities involved:

- Industrial R&D: mostly applied research
- Academic R&D: mostly basic research
- Governmental R&D: mix of basic and applied research

Basic Science

why is this
important?



Applied Science



How can I
use this?



R&D

Distinguishing features

- More long-term work
- Open-ended, ambiguous problems
- More independence needed
- Significant background (PhD degree) is needed
- Constant learning & literature review
- Creative type of work



R&D in academia (universities):

- Roles: PhD, Postdoc, Research Scientist, Professor
- Focus is on understanding things (basic research)
- Main goal: advance knowledge & publish papers
- More independence & freedom
- Work with students
- Usually, involves teaching



R&D in industry (companies):

- Roles: Research scientist, research engineer
- Focus is using acquired knowledge to build things (applied research)
- Main goal: acquire knowledge useful to company
- Less independence & freedom
- Work with other researchers & management
- More teamwork

ExxonMobil
Upstream Research

Fundamental skills: technical

Core general engineering:

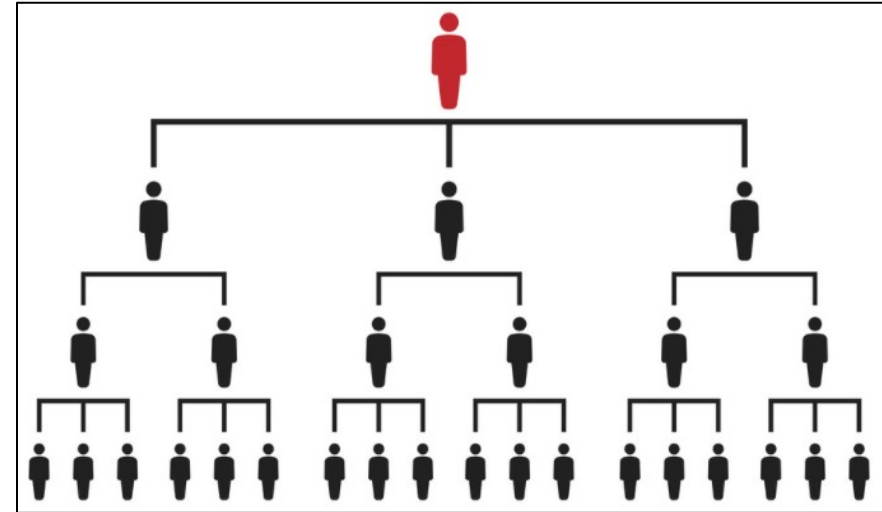
1. Applied math (calculus, differential equations, probability & statistics, linear algebra)
2. Physics (fluid mechanics, thermodynamics)
3. Chemistry (general, organic)

Core petroleum engineering:

1. Reservoir Engineering/Simulation
2. Production Engineering
3. Drilling Engineering

Very useful:

- Programming
- Data analysis & visualization
- Petroleum Economics
- Geosciences (Geology, Geophysics, Petrophysics)



Fundamental skills: soft skills

1. Communication skills

- Written
- Verbal
- Presentation skills

2. Teamwork

3. Leadership

4. Active listening & responsiveness to feedback

5. Time management, planning & prioritization



Value of MSc degree

Valid reasons for doing MSc:

- Career change
- Access to foreign market / immigration
- Boosting your credentials for PhD / jobs
- International experience
- More specialized knowledge

Some not very valid reasons for doing MSc:

- You are not sure what to do
- You have free time
- MSc degree at some point will help with career progression



Data Science skills

- Short definition: Extracting value from data by using scientific methods
- Relatively new field with a promising career outlook
- Lots of applications in industry, academia, government sector
- A lot of confusion about its scope, roles, tools, required knowledge for jobs
- Very useful for jobs in O&G as well, especially for operators
- Just start learning somewhere (Python, basic statistics, Machine Learning)



Useful resources

- Company websites
- Quora & reddit
- Linkedin
- Glassdoor & Indeed
- OnePetro

Stay tuned!

Possible future sessions

- Presentation about some aspects of doing PhD / doing research
- Presentation about some aspects of Machine Learning and Data Science

Final remarks & QA

As long as you keep working & stay curious, you can always move forward within O&G and even outside

Thanks.

Questions??