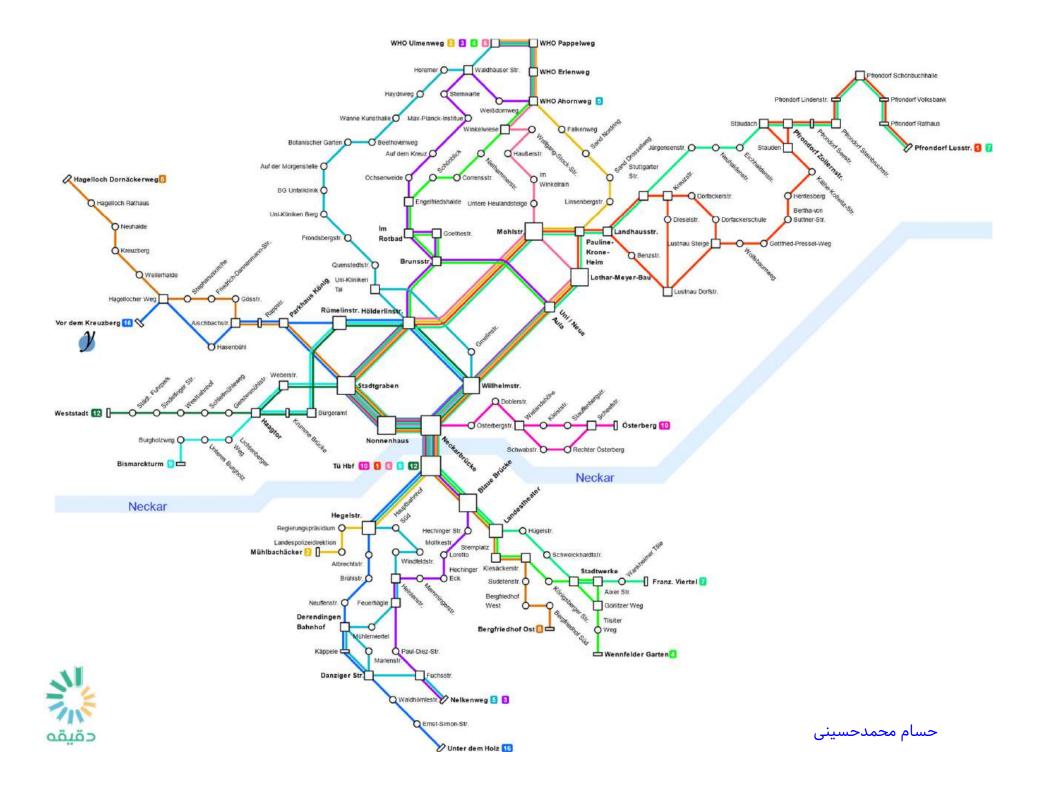
# Data analyst vs Data Engineer Roadmap and more

Hessam Mohammad Hosseini



حسام محمدحسيني



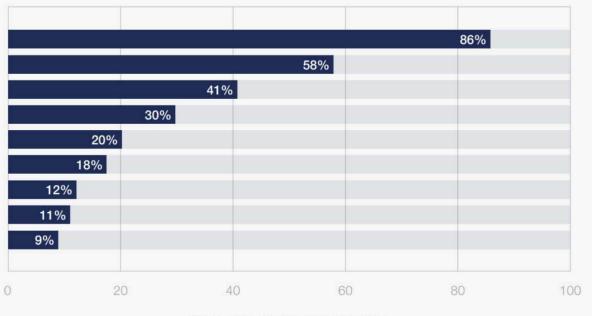
# Data Skills on denmand

### FIGURE 1.2

#### Technology trends driving business transformation, 2025-2030

Share of employers surveyed that identify the stated technology trend as likely to drive business transformation

Al and information processing technologies Robots and autonomous systems Energy generation, storage and distribution New materials and composites Semiconductors and computing technologies Sensing, laser and optical technologies Quantum and encryption Biotechnology and gene technologies Satellites and space technologies

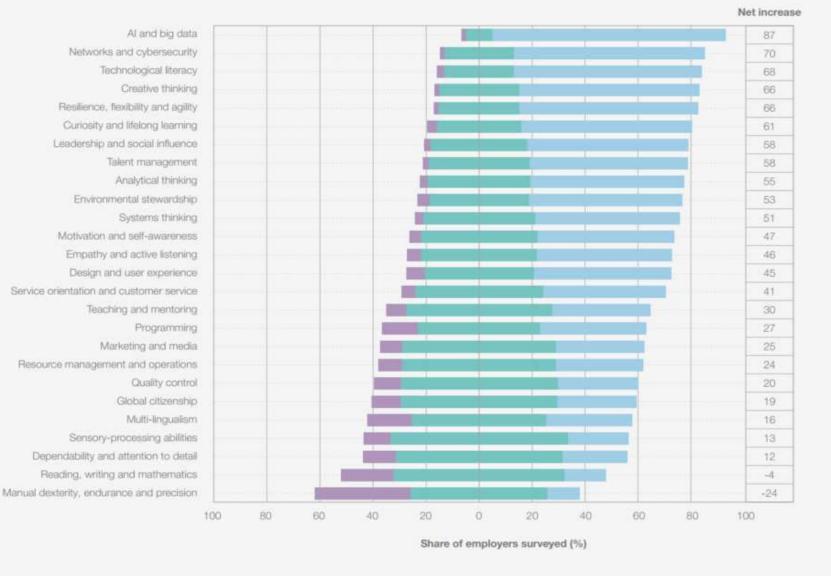


Share of employers surveyed (%)

### FIGURE 3.4 Sk

#### Skills on the rise, 2025-2030

Share of employers that consider skills to be increasing, decreasing, or remaining stable in importance. Skills are ranked based on net increase, which is the difference between the share of employers that consider a skill category to be increasing in use and those that consider it to be decreasing in use.



E Decreasing use Stable use

Increasing use

### FIGURE 2.3

#### Job growth and decline (%), 2025-2030

Projected job creation Solatis and deplacement (purple) between 2025 and 2030, as a percentage of total current employment in the conseponding (do role. The projected net growth or deckie for each occupation over the next five years (demonds) is calculated by subtracting total job displacement from total job creation.

0	Chemists and Chemical Laboratory Scentists Mechanical Engineers	2
N.	Architects and Surveyors	X
	Secondary Education Teachers	X
	Garment and Related Trades Workers	1X
	Food Processing and Related Trades Workers	X
	Compliance Officers	X
	Financial and Investment Advisors	ŏ
	Health and Education Services Managers	č –
	"Sheet and Structural Metal Workers	K I
	Arbitrators, Mediators, and Conciliators	ă I
	Relationship Managers	×.
	Sciectal Education Teachers	ă I
	Electrical Equipment Installers and Repairers	õ
	Construction Laborers	õ
	*Sales Recresentatives, Wholesale	lõ 📗
	Building Framers, Finishers, and Related Trades Workers	6
	Sales and Purchasing Agents and Brokers	6
	Chemical Processing Plant Operators	lõ
	Vocational Education Teachers	6
	Social Work and Counselling Professionals	0
	Primary School and Early Childhood Teachers	0
	Manufacturing, Mining, Construction	6
	Food and Beverage Serving Workers	0
	Shop Salespersons	0
	Power Production Plant Operators	0
	Managing Directors and Chief Executives	0
	Human Resources Specialists	0
	General and Operations Managers	0
	Financial Analysta	0
	Mechanics and Machinery Repairers	0
	Heavy Truck and Bus Drivers	<u> </u>
	Lawyers	9
	Mining, Petroleum and Other Extraction Workers	9
	Survey Researchers	<b>P</b>
	Assembly and Factory Workers	000000000000000000000000000000000000000
	Chemical Engineers	2
	Client Information and Customer Service Workers	2
	Security Guards	2
	Recruiters and Technical Recruiters	

**Big Data Specialate** FinTech Engineers Al and Machine Learning Specialists Sattware and Applications Developers Security Management Specialists Data Warehousing Specialists Autonomous and Electric Vahide Specialists UI and UX Designers Light Truck or Delivery Services Drivers Internet of Things Specialists Data Analysts and Scientists Environmental Engineers Information Security Analysts **Devops Engineer** Renewable Energy Engineers Robotics Engineers Blockchain Developers Data Engineers **Digital Transformation Specialists** Process Automation Specialists Sustainability Specialists Renewable Energy Technicians System Engineers Organisational Development Specialists Online Learning Managers Digital Marketing and Strategy Specialists Environmental Protection Professionals Solar Energy Installation and System Engineers Database and Network Protessionals Car, Van and Motorcycle Drivers Full Stack Engineers Food Scientists and Technologists ICT Operations and User Support Technicians 'Drafters, Engineering Technicians... E-commerce Specialists Strategic Advisors Social Media Strategist Hotel and Restaurant Managers Business Development Prolessionals Personal Care Aides

System Engineers         O         Menutacturing, Maring, Construction, Product Development, Specialists           Original Marketing, and Stattery Specialists         O         Power Production Protestion Protestice Protect Pro		
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Sales and Marketing Professionals	0	
	0	
Social Scientists and Related Workers	0	
Supply Chain and Logistics Specialists	O I	
Economista Claims Adjusters, Examiners, and Investigators	õ	
Management and Organisation Analysts	0	
University and Higher Education Teachers	õ	
Water Transportation Workers	6	
Industrial and Production Engineers	ō	
Chefs and Cooks	O I	
Electrotechnology Engineers	6	
Nursing Protessionals	6	
Media and Communication Workers	ö	
Child Engloserer	8	
Civil Engineers Data Entry Clerks Incutatory and Covernment Associate Professionals		
Regulatory and Government Associatel Professionals O Bank Tellers and Pelated Clerks C Postal Service Clerks C	č i i	

Sitars of current workforce (%)

Share of current workdorce (%)

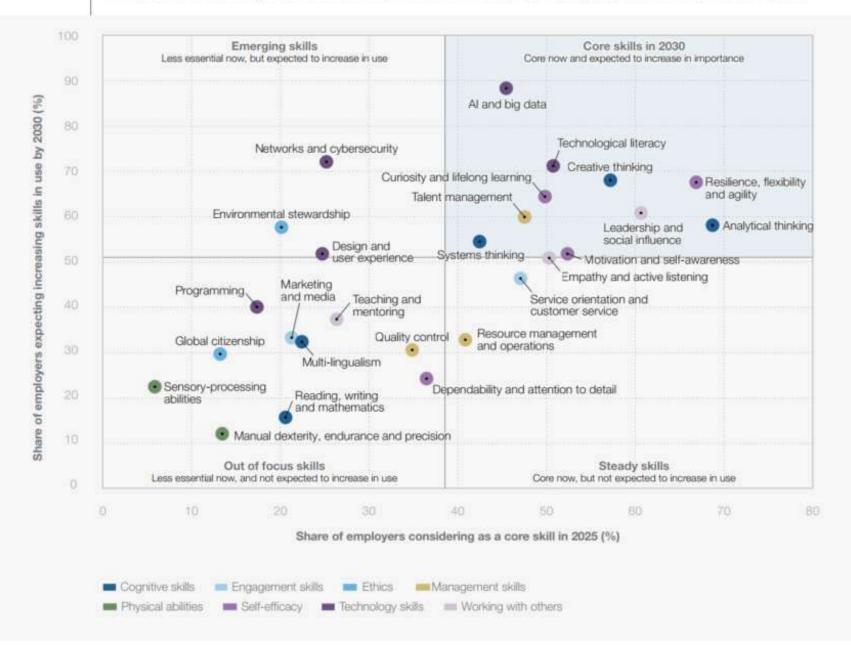
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Jobs created == Jobs displaced Net growth or displaced

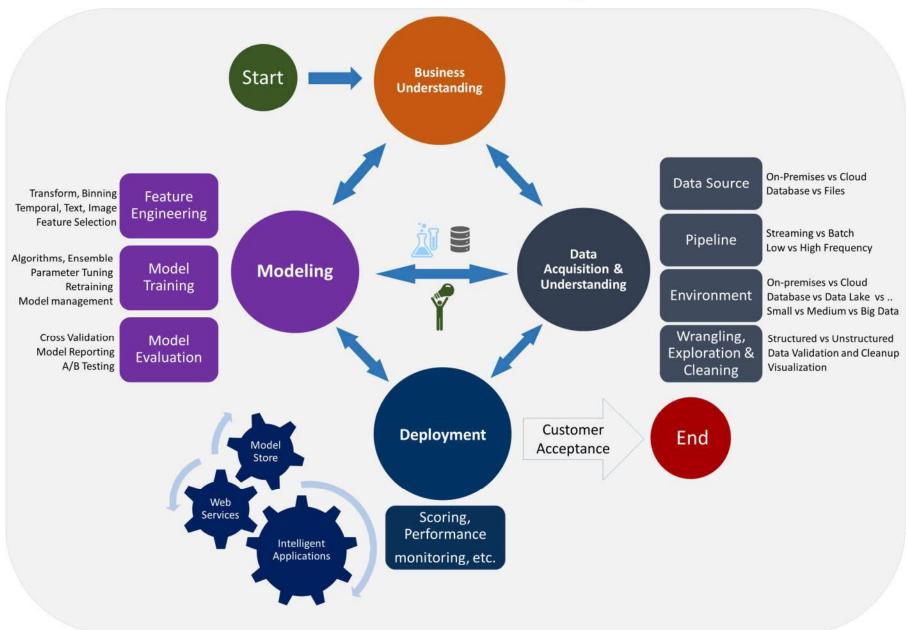
### FIGURE 3.6

#### Core skills in 2030

Share of employers considering skills to be a core skill in 2025 and share of employers expecting skills to increase in importance by 2030.



# **Data Science Lifecycle**



https://microsoft.github.io/azureml-ops-accelerator/1-MLOpsFoundation/2-SkillsRolesAndResponsibilities/1-AdoptingDSProcess.html

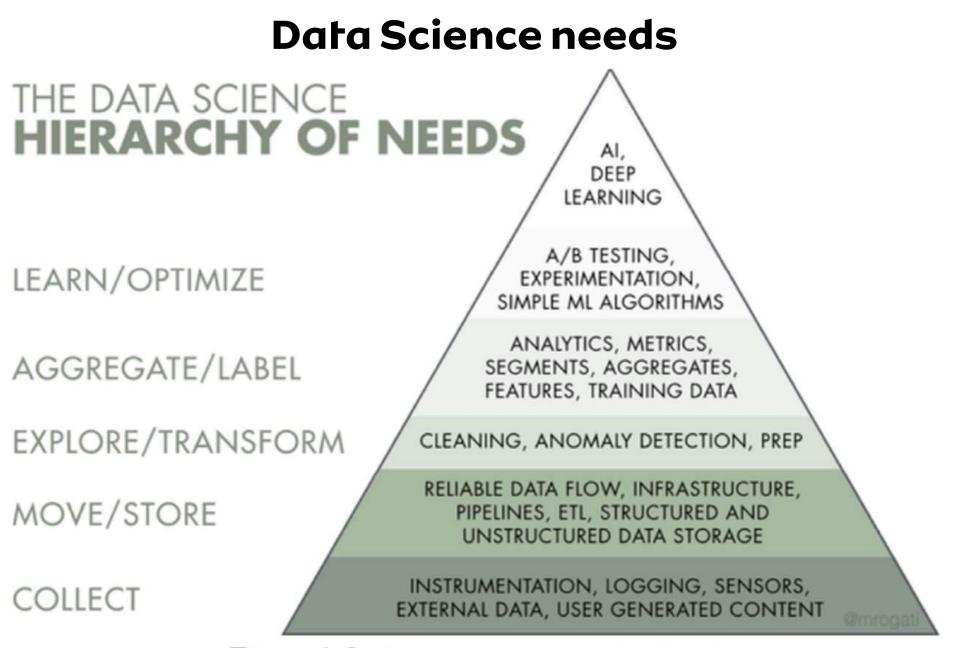
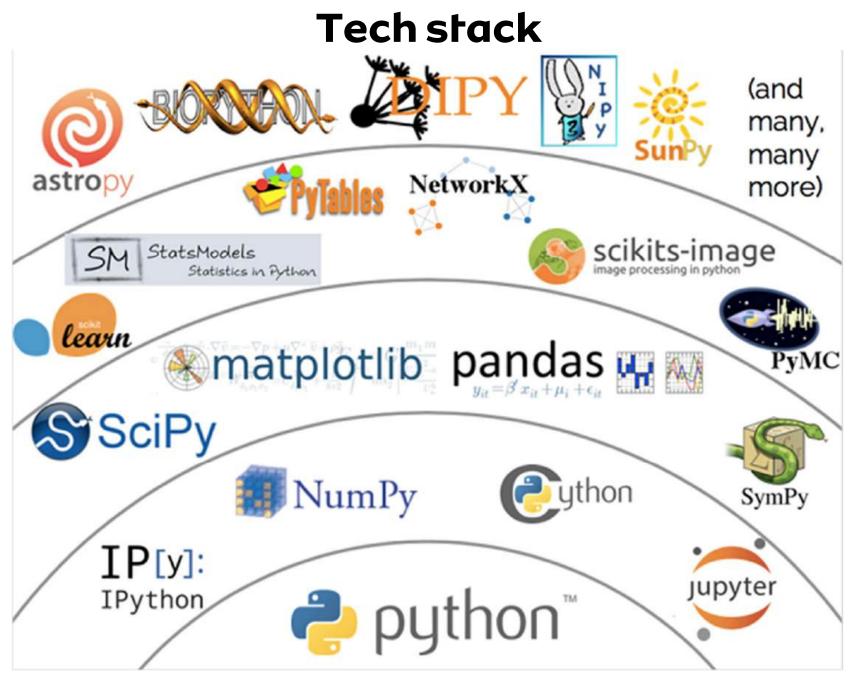


Figure 1-5. The Data Science Hierarchy of Needs



https://github.com/jorisvandenbossche/talks/blob/master/2017 INRIA pandas/img/JakeVdP-ecosystem5.svg

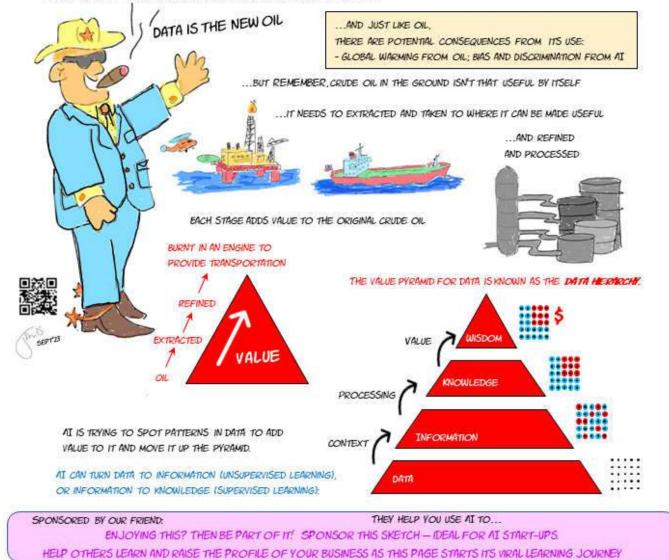


### SKETCH 1, DATA HIERARCHY

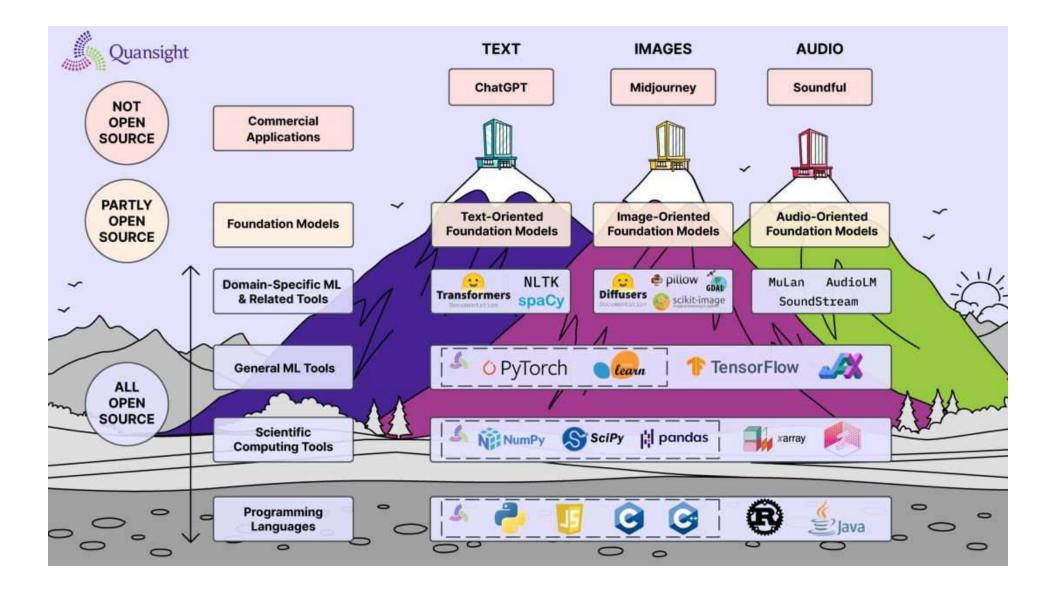


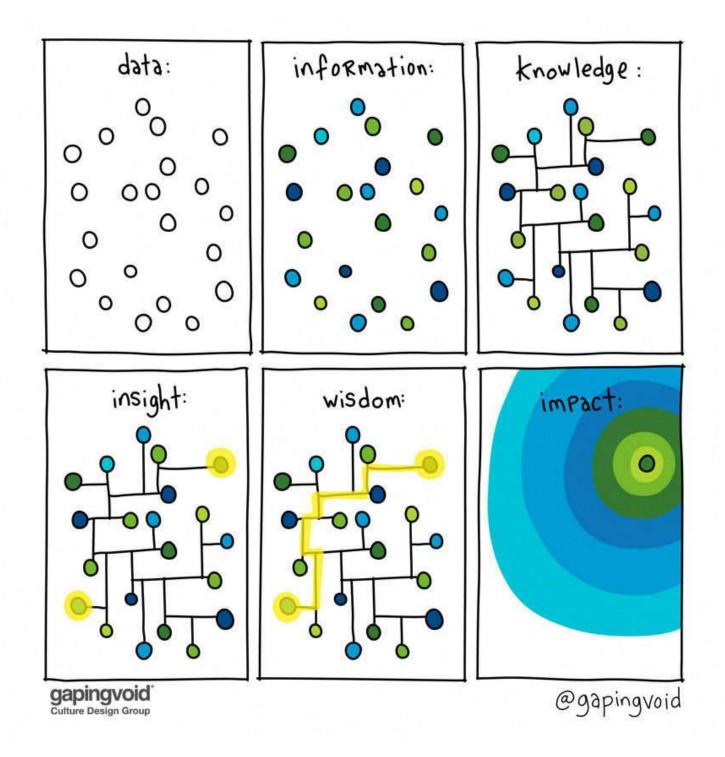
AI CAN DO AMAZING THINGS LIKE LIVE LANGUAGE TRANSLATION AND IMAGE RECOGNITION - BUT THAT IS ONLY POSSIBLE BECAUSE OF THE DATA IT IS TRAINED UPON - AND HUGE AMOUNTS OF IT. IF YOU WANT TO KNOW ABOUT AI, YOU NEED TO KNOW ABOUT DATA.

DATA IS A COLLECTION OF FACTS OR VALUES, SUCH AS NUMBERS, WORDS, MEASUREMENTS, OBSERVATIONS, OR DESCRIPTIONS. TO BE USEFUL, IT NEEDS TO BE COLLECTED TOGETHER IN A SIMILAR FORM, SO THAT IT CAN BE ACCESSED, ANALYSED AND PATTERNS FOUND WITHIN IT- WHICH ALLOWS SOME MEANING TO BE DERIVED FROM IT.

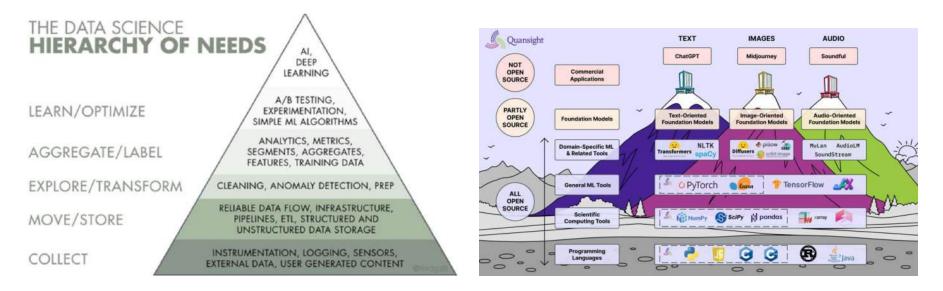


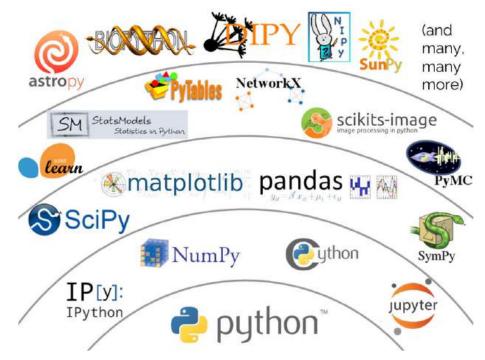
# "If I have seen further, it is by standing on the shoulders of giants."





# Connecting





## **Types of Data Professionals**

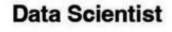
## Where are you?



**Data Scientists** ML Ops

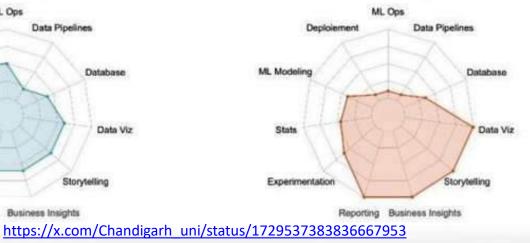


**Data Analysts** ML Ops

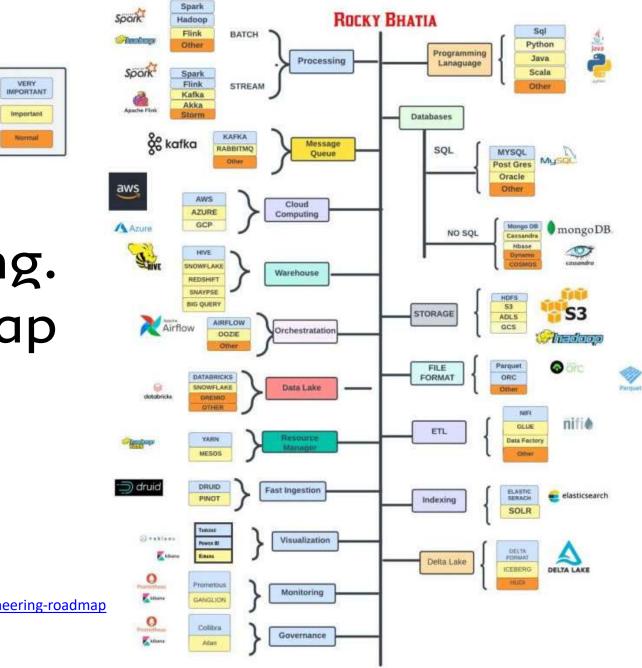




# **Data Analyst**

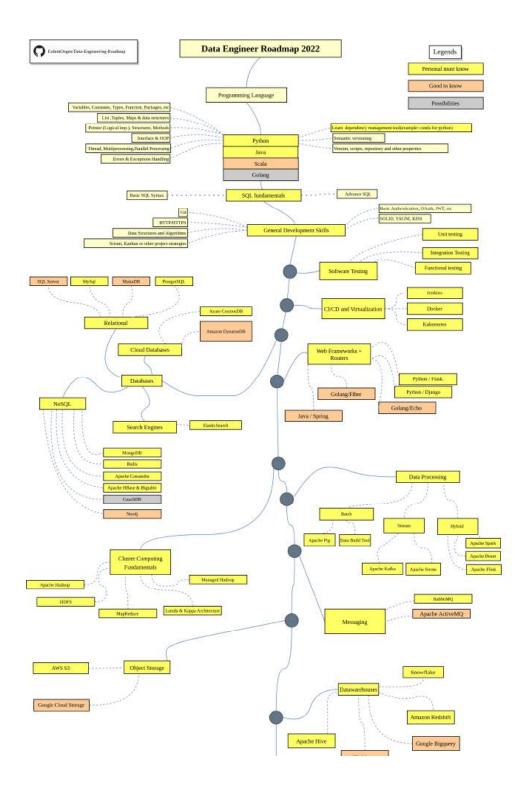


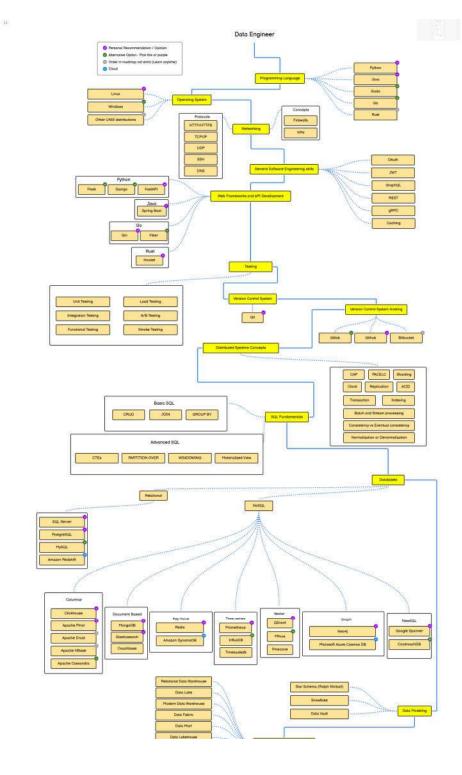
VALA ENGINEERING ROADMAP

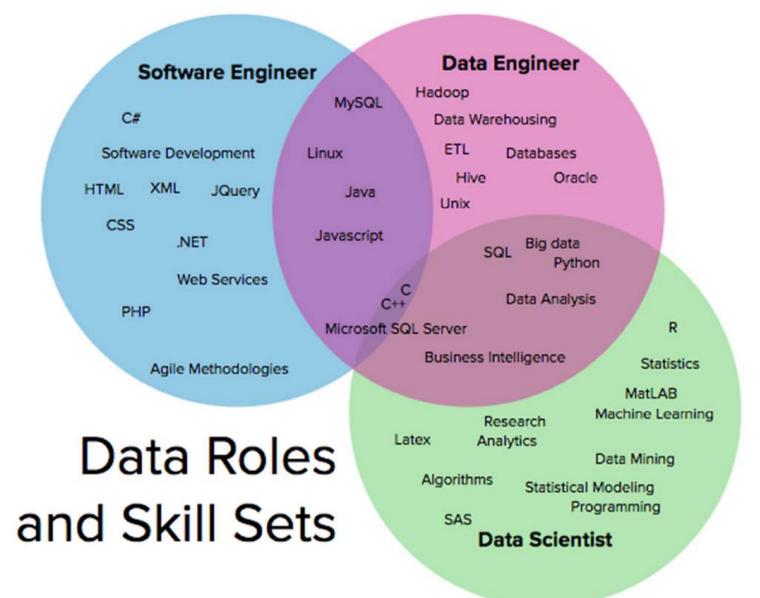


# Data Eng. Roadmap

https://github.com/data-burst/data-engineering-roadmap https://roadmap.sh/







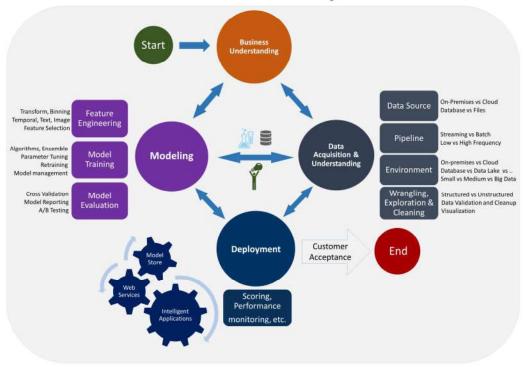
https://ryanswanstrom.com/2016/11/28/data-scientists-data-engineers-software-engineers-the-difference-according-to-linkedin/

# **DS needs**

Data Science Lifecycle



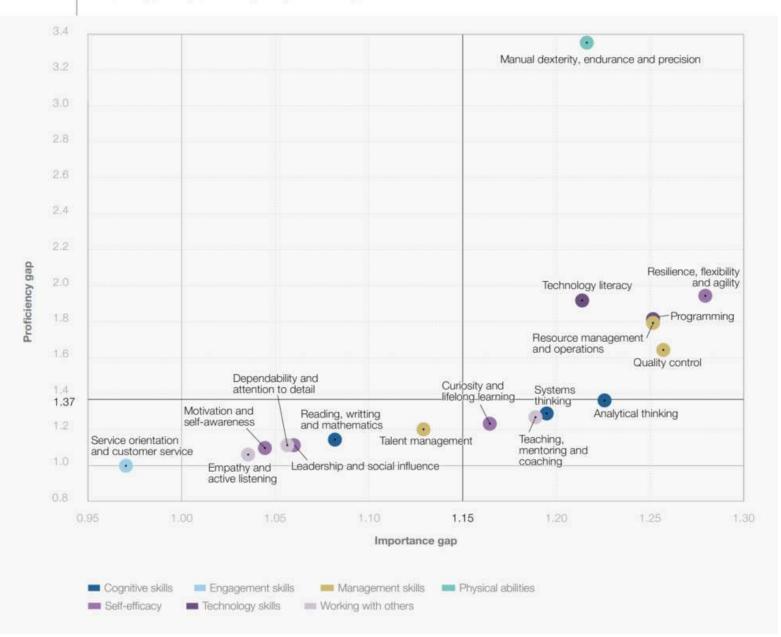
- Data preprocessing (cleaning)
- Data analysis
- Data Analytics
- Missing data handeling



• LLMs (Chatbots) could help

### FIGURE 3.7 Skill importance gap and skill proficiency gap between growing and declining jobs

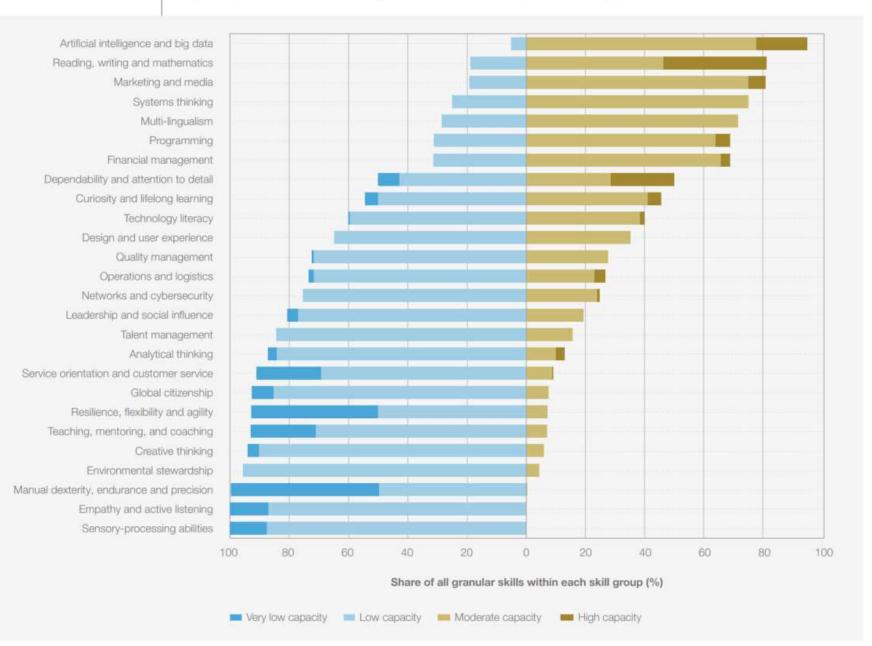
When growing and declining job roles attach the same level of importance and proficiency to a skill, the index equals one. The bigger the value, the bigger the gap between growing and declining jobs.



### FIGURE B3.1

#### Current capacity for substitution by Generative AI, by skill group

Capacity of GenAl substituting a human in performing a given skill as a percentage share of all granular skills within each skill group. Analysis based on GPT-40, with over 2800 granular skills from the Indeed database as of August 2024.



# Skill set

Data Analyst	Data Engineer	Data Scientist
Data Warehousing	Data Warehousing & ETL	Statistical & Analytical skills
Adobe & Google Analytics	Advanced programming knowledge	Data Mining
Programming knowledge	Hadoop-based Analytics	Machine Learning & Deep learning principles
Scripting & Statistical skills	In-depth knowledge of SQL/ database	In-depth programming knowledge (SAS/R/ Python coding)
Reporting & data visualization	Data architecture & pipelining	Hadoop-based analytics
SQL/ database knowledge	Machine learning concept knowledge	Data optimization
Spread-Sheet knowledge	Scripting, reporting & data visualization	Decision making and soft skills

# **Roles and Responsibilities**

Data Analyst	Data Engineer	Data Scientist	
Pre-processing and data gathering	Develop, test & maintain architectures	Responsible for developing Operational Models	
Emphasis on representing data via reporting and visualization	Understand programming and its complexity	Carry out data analytics and optimization using machine learning & deep learning	
Responsible for statistical analysis & data interpretation	Deploy ML & statistical models	Involved in strategic planning for data analytics	
Ensures data acquisition & maintenance	Building pipelines for various ETL operations	Integrate data & perform ad-hoc analysis	
Optimize Statistical Efficiency & Quality	Ensures data accuracy and flexibility	Fill in the gap between the stakeholders and customer	

# سوال و جواب

Hesam Mohammad-Hosseini

# Al effect

