Impact Of Data Science In Business

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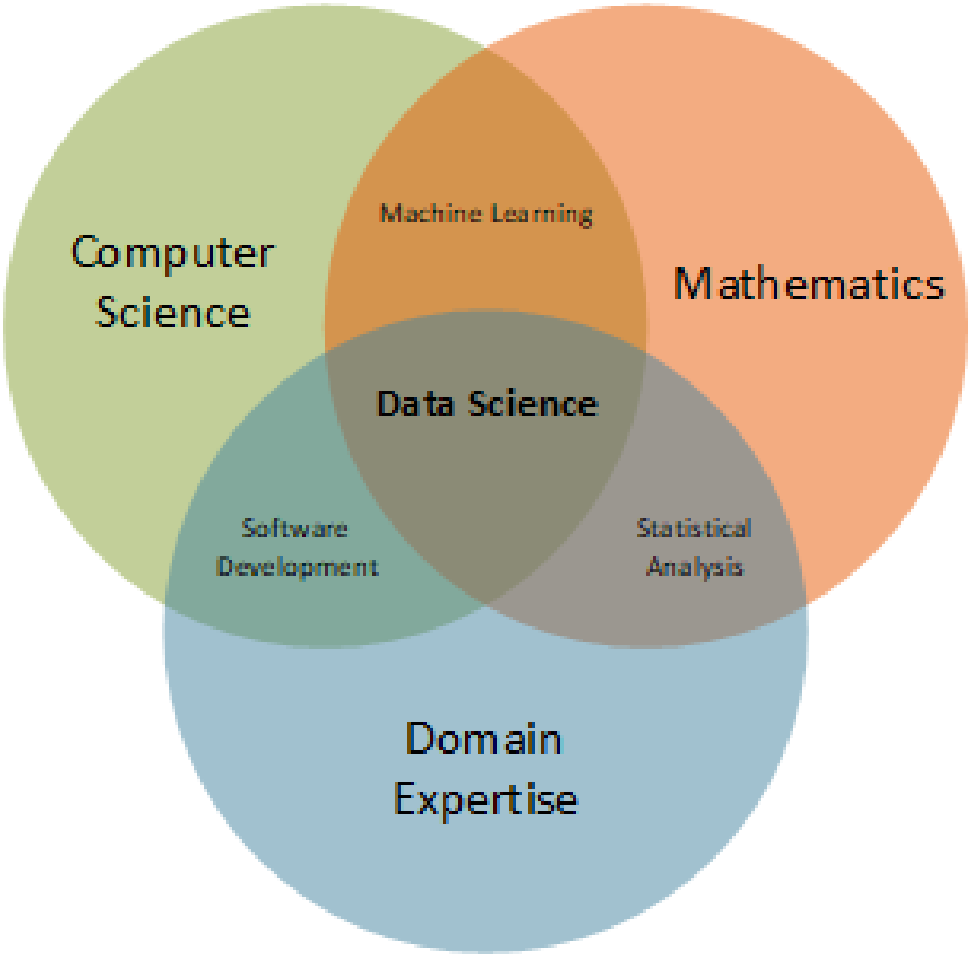
- To start, you might try wrapping your head around just how much raw data humans have put out into the world.
- The exact figure is not known, but an article published on Seed Scientific in October 2021 estimated that there were 44 zettabytes of data in the world in 2020.
- It further estimated that 2.5 quintillion more bytes of data are created daily.
- By 2025, the amount of data generated each day is expected to reach 463 exabytes globally.
- For scale, there are one million bytes in a megabyte (MB), and one billion bytes in a gigabyte (GB).
- One quintillion bytes are equal to one exabyte, and one thousand exabytes equal one zettabyte.
- One would need a big head, indeed, to wrap around that much data.



https://bi-insider.com/posts/data-science-overview/

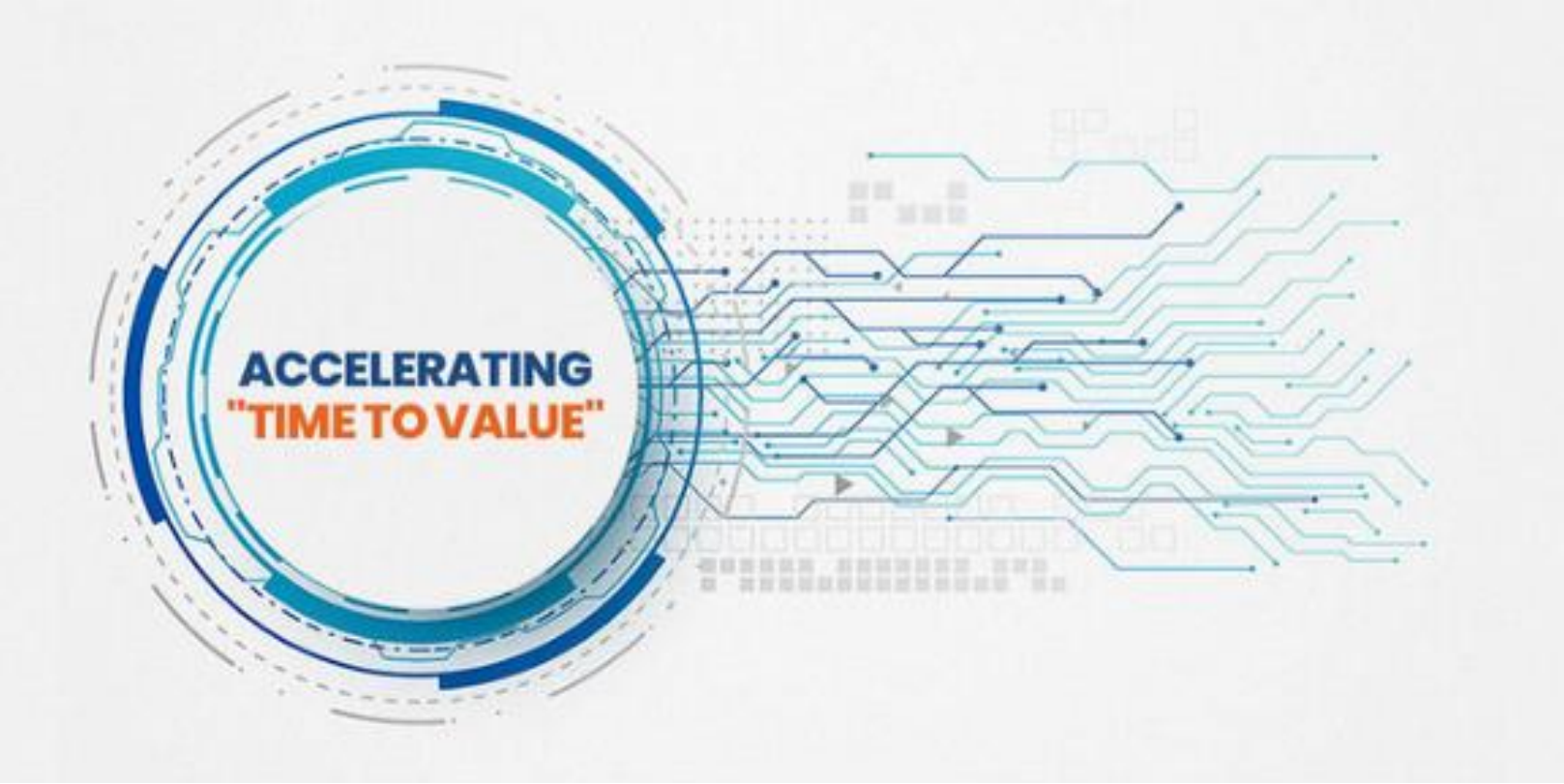
Disciplines That Create Data Science

- Basic disciplines within data science:
  - Computer Science: Encompasses both the theoretical study of algorithms (i.e. well-defined procedures that allows a computer to solve a problem), and the practical problems involved in implementing algorithms in terms of digital computer hardware and software.
  - Mathematics: The study of the measurement, properties, and relationships of quantities and sets, using numbers and symbols including arithmetic, algebra, geometry, and calculus.
  - Domain Expertise: Deep understanding and knowledge in a specific business area, business process, business area, business function, or technical subjects for a project or program.

Disciplines That Create Data Science

- Cross-functional disciplines within data science:
  - Machine Learning: An application of artificial intelligence that provides systems the ability to automatically learn and improve from experience without being explicitly programmed.
  - Statistical Analysis: Science of collecting, exploring and presenting large amounts of data in order to discover probability, relationships, correlation, and trends.
  - Software Development: Process of designing, programming, & deploying executable computer programs for the purpose of accomplishing a specific computing task.

Source: https://towardsdatascience.com/


ACCELERATING
"TIME TO VALUE"

Predicts Trends and Customer Behavior

- Predictive models are essential business tools.
- Data scientists organize huge swathes of historical data and utilize it to inform planning processes, thus helping businesses make informed decisions about the future.
- **It's possible, for example, to determine peak customer shopping times and adjust staff levels accordingly**, or to identify early buyer trends and implement appropriate promotional campaigns.

Enables Competitor Research

- As much as companies value data that helps them understand their customers and internal processes, they're also eager to gain an edge over their competitors.
- **Data scientists are responsible for understanding and gleaning insights from data about competitors.**
- Effective competitor research helps businesses make competitive pricing decisions, reach new markets, and stay up to date with changes in consumer behavior.

Case Studies

1. How Pfizer Is Using Artificial Intelligence Technology [Detailed Case Study]
2. How Does Amazon & Netflix Personalization Work?
3. Case Study: Unilever's Integration of AI in the Supply Chain - AIX
4. The Evolution and Scaling of Predictive Maintenance: A Comprehensive Overview
5. Deploying Generative AI In Wealth And Asset Management
6. UPS Routing Software (ORION): Does it Really Help Drivers Manage Their Work Efficiently?

Data science and machine learning are having profound impacts on business.

Gartner research director Erick Brethenoux explains the five categories of impact and provides real-world examples taken from the worlds of
government, sport and business.

Innovation: Foster new thinking and business disruptions based on data science

“ Data scientists hold the key to unveiling better solutions to old problems”

Moneyball

- One example, popularized by the film and book Moneyball, showed how old ways of evaluating performance in baseball were outperformed by the application of data science.
- One baseball team used data science techniques to overcome its financial disadvantage.
- It achieved this by using analytics to identify high-performing players who other teams had overlooked using traditional methods, and therefore acquired their services at a relatively low cost.
- The result was that the team regularly beat higher-spending competitors in their league.

Moneyball

- The "Moneyball" concept has evolved significantly since 2003.
- Today, data science and analytics are deeply ingrained in professional sports, with advanced metrics, player tracking technology, and sophisticated modeling influencing nearly every aspect of the game.
- Teams now employ specialized data science departments, utilize machine learning algorithms, and leverage insights from vast datasets to optimize decision-making.
- This includes strategies like:
    - Player recruitment and evaluation: Identifying undervalued players based on advanced metrics and performance indicators.
    - Game strategy and tactics: Optimizing pitch selection, defensive positioning, and offensive approaches based on real-time data analysis.
    - Injury prevention and performance optimization: Analyzing training data and movement patterns to predict injury risk and optimize player workload.

UPS ORION

- Another example is that of a multinational package delivery company, UPS.
- Its On-Road Integrated Optimization and Navigation (ORION) system used data science to figure out how to significantly change the routing of its delivery trucks using many new data sources.
- The impact was hundreds of millions of dollars of savings and an improved customer experience.

Exploration: Explore unknown transformative patterns in data

Japanese Maritime Services

- Data scientists should be encouraged to make "big data expeditions" where there is no clear objective other than to explore the data for previously undiscovered value.
- For example, Data scientists at a Japanese maritime services provider realized that when providing their traditional services for ship classification, they were collecting a valuable store of data that had great potential in other areas.
- Ship classification data might include detailed information about the performance and maintenance history of different types of ships, fuel efficiency, navigation patterns, and operational practices.
- Applying the right analysis to this data meant that ship operators could reduce equipment failures and lifetime maintenance costs by 10%.
- This allowed the organization to quickly increase its market share by 20% when offering this value-added service to customers.

Prototyping: Challenge the status quo with radical new solutions

- “ Data science is already changing lives for the better — or even saving them”

- A U.S.-based police department that needed an efficient automated way to pull actionable insights from a huge volume of crime data.
- The predictive analytics solution put in place generated crime "forecasts" that optimized deployment of police forces, reducing the murder rate by 35% and robberies by 20% year over year.
- The estimated ROI of these impacts was 863%.
- Automated analysis of various disease symptoms and medical test data is another common area where the application of data science is already changing lives for the better — or even saving them.

Refinement: Continuously improve existing processes and products

- “ A deeper dive by a data science team can uncover something interesting about what is really happening

- Zurich Insurance, which reduced the inefficiencies around handling injury claims by using an **artificial intelligence (AI)** solution to fully automate injury report assessments.
- It leveraged AI to fully automate the medical report evaluation so that human agents could focus on value-added activities such as negotiating with the counterparty.
- The time to assess a medical report was cut from one hour to just a few seconds, saving $5 million per year.

Firefighting: Identify the drivers of certain undesirable situations

- For example, a rise in customer complaints or a rapid drop in profitability. In these narrow cases, the data science team has to identify only the cause, which limits the range of datasets it needs to analyze.

Questions?