Section 1: Introduction (30 seconds)

[Eduardo]

Hello everyone!
We are Group 8 from the course *Data-Driven Decision Making*.
Our team members are Irene Romero Sadaba, Miguel Albuquerque, Meeno Bröker, Aku Siekkinen and me, Eduardo Ezponda. For this assignment, we contacted a Data Scientist working in the steel manufacturing industry to understand how companies collect and use data for decision making. Today, we'll present the main findings from the interview, including data collection methods, use cases, challenges, and future plans.

Section 2: Company Background (30 seconds)

[Irene]

The company we studied operates in the steel manufacturing industry, producing and processing steel products used in construction, automotive, and heavy machinery sectors.

Our interviewee, Alain, works there as a Data Scientist. His main responsibility is to collect and analyze data from different points of the supply and production chain.

One key project he worked on involved solving an operational inefficiency: by gathering and analyzing process data, he was able to identify patterns and build a predictive model. This model helped reduce production delays and optimize throughput, and it was successfully deployed into the company's operations.

Section 3: Interview Questions (4 minutes)

Data & Business Goals (45 sec)

[Eduardo]

The company tracks several key performance indicators to manage and improve its operations.

Some of the main KPIs include production output per hour, machine downtime, scrap rate, and energy consumption per ton of steel.

One of the most critical metrics is the downtime of a key rolling machine, as it directly impacts overall throughput and delivery times.

To address this, a project was led where historical sensor data—such as temperature, vibration, and pressure—was analyzed.

By using this data, the team built a predictive maintenance model that could forecast failures before they happened.

As a result, unplanned downtime was reduced by almost 30%, significantly improving operational efficiency and reducing costs.

Over time, the company has shifted its approach: moving from simply monitoring output to focusing on process reliability and predictive insights, making data an active driver of decision-making.

Data Collection & Storage (45 sec)

[Irene]
The company collects a wide variety of internal data from its production lines. This includes sensor readings like temperature, pressure, speed, and vibration from machines across the plant. Additionally, they track operational logs, quality control data, and manual entries made by technicians.

On the external side, they incorporate weather data, market demand forecasts, and raw material prices, all of which help in production planning.

All this information is centralized in a cloud-based data lake built on Microsoft Azure. They use a combination of SQL databases and time-series storage to handle the high-frequency sensor data. For data processing and analysis, the company relies on Databricks and Power BI, allowing them to create interactive dashboards.

To ensure data privacy and security, access is controlled through role-based permissions.

Analysis & Decision Making (1 min)

[Eduardo]
A real-life example of how data analysis helped in making a business decision comes from the cooling process of steel coils.
The company noticed that some batches were developing small cracks, leading to material waste.

By collecting data from the cooling system sensors and combining it with quality inspection reports, they discovered that the cracks mainly occurred when cooling times were too short. They then built a simple regression model that calculated the ideal cooling time based on coil thickness and ambient temperature.

After testing and validating the model, the operations team adjusted the cooling settings accordingly. As a result, defects were reduced by over 20%, saving both time and materials.

For the tools and technologies used, the Data Scientist mainly works with Python, especially using libraries like Pandas, Scikit-learn, and Matplotlib for data analysis and modeling. For accessing and querying data, they rely on SQL.

To present results to managers and stakeholders, they use Power BI dashboards because they are interactive and easy to understand. In some cases, they also use Excel when the audience is more familiar with it.

Data Culture & Challenges (1 min)

[Irene]
The company is strongly focused on promoting a data-driven culture among its teams. One important initiative is training non-technical staff to understand and use dashboards. They also organize monthly data review sessions where key metrics are explained in simple language to team leaders. The goal is to make data part of everyday conversations, not something handled only by the data team.

Of course, there have been challenges. In one case, a forecasting model for raw material demand was developed but not updated when market conditions changed. This mistake led to overstocking, costing the company money. It showed how important it is to keep models updated and to involve operational teams early in data projects.

On a positive note, one major success came from a real-time monitoring system they developed. It tracked machine vibrations and alerted the team just before a critical part was about to fail. Thanks to this early warning, the company avoided a full-day shutdown, saving tens of thousands of euros and reinforcing the value of investing in data initiatives.

Future Outlook (1 min)

[Miguel]
Looking towards the future, the role of data in the company is expected to become even more important. The company is moving towards automated decision-making systems, especially in areas like predictive maintenance and quality control.

The aim is to create systems that can not only monitor but also predict issues and automatically suggest or trigger actions without manual intervention.

They also have plans to implement AI models to detect production anomalies in real time, improving reaction speed and reducing downtime even further. Instead of relying only on human observation, the systems will flag issues proactively based on data patterns.

The long-term vision is to develop a smart factory, where most decisions—whether operational adjustments or strategic planning—are supported or even fully made by data-driven systems. This transformation is expected to increase efficiency, reduce costs, and make the company more competitive in the global steel market.

Wrap-Up (30 sec)

[Eduardo]
To close our presentation, we would like to thank our interviewee, Alain, for sharing his valuable insights. It was very helpful to understand how data plays such a crucial role in decision-making within the steel industry.

[Irene]
In summary, we learned that data is deeply integrated into all aspects of the company's operations — from defining KPIs, to predictive modeling for maintenance, and strategic forecasting for production efficiency.

[Eduardo]
We also saw how building a strong data-driven culture and adopting new technologies like AI are key steps toward creating smarter, more automated factories for the future.

[Miguel]
Thank you again for your attention. We hope you enjoyed our presentation!