Data science for Smart Manufacturing

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Data Science and Analytics

About me

- **Mechanical engineering** background
- **2008** - Co-Founder of a thinking design **start-up** active in industrial innovation
- **2012** - **MBA** - College des Ingenieurs
- **2013** - Pirelli - **Process engineering** department
- **2016** - Pirelli - **Data Science and Analytics**
- Linkedin profile

Pirelli

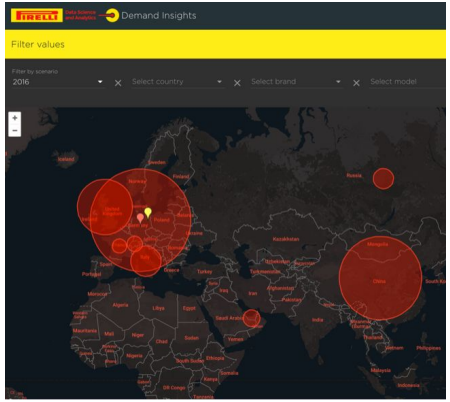
- The 5th world’s largest tyre manufacturer
- Leader in the Premium and Prestige market
- Only supplier of Formula 1 tyres
- The Calendar

Why Data Science and Analytics in Pirelli?

- Capitalize on the amount of data available
- Build services around data
- Drive a cultural change

Main cluster of activities

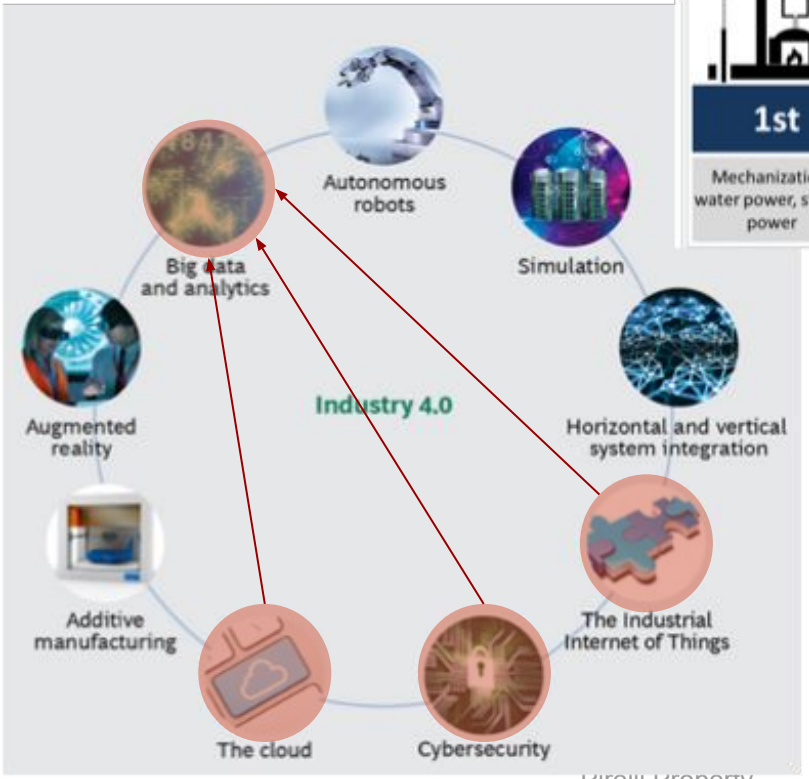
Smart Manufacturing

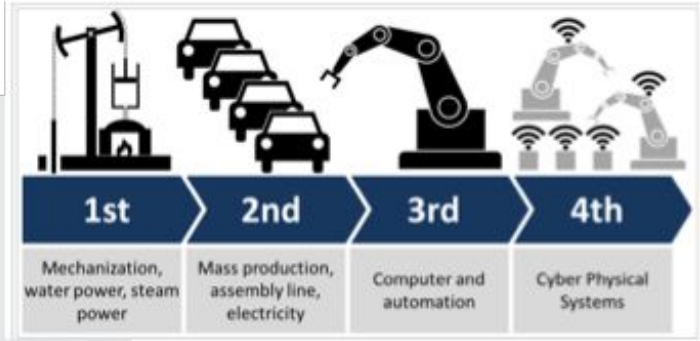


Integrated value chain
-
Demand Forecasting

Services built on top of
Cyber Technologies

Smart Manufacturing - Industry 4.0





" [...] the current trend of automation and data exchange in manufacturing technologies. It includes cyber-physical systems, the Internet of things and cloud computing? - Wikipedia

Smart Manufacturing for Pirelli

Leverage our data and people

to combine our capabilities

to optimise the manufacturing process

The art of making tyres - video

Complexity in a tyre

More than **100** components for each tyre

More or less **1000** data points for each tyre during manufacturing

More than **25.000** tyres/day (one factory) with **100** different product every day

Data Science Definition

“
Data Science
is the art of
turning data into
actions
”

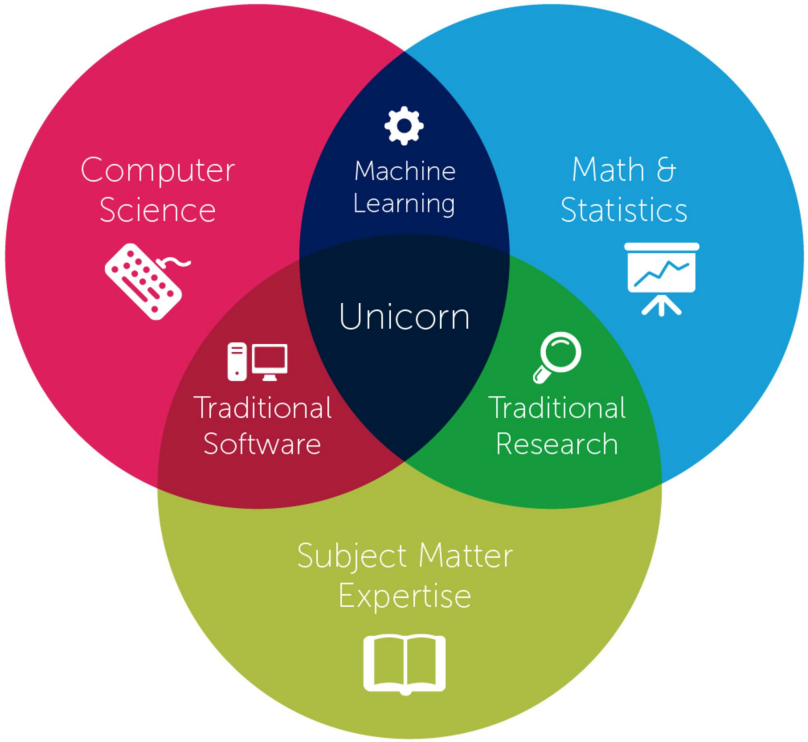
...fitting really well in manufacturing!

Source: Booz Allen Hamilton

Data Science and Analytics

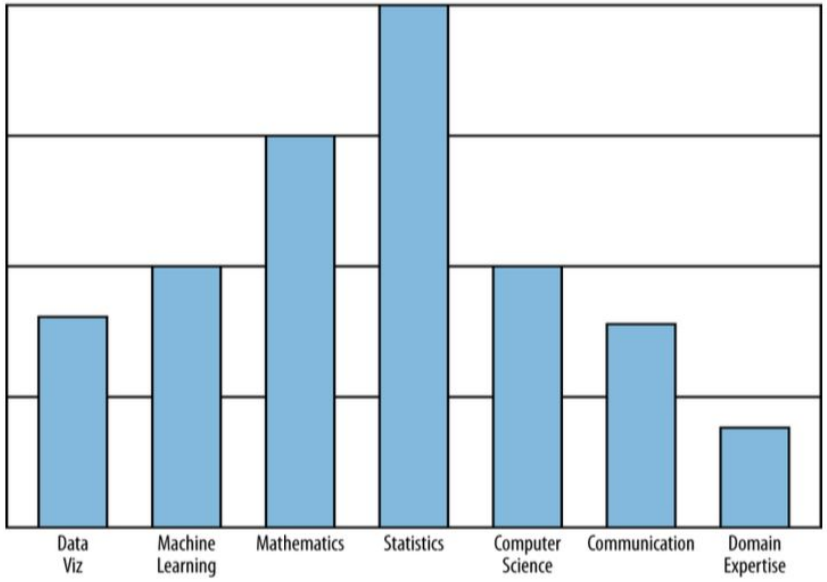
PIRELLI

Data Scientist Profile...



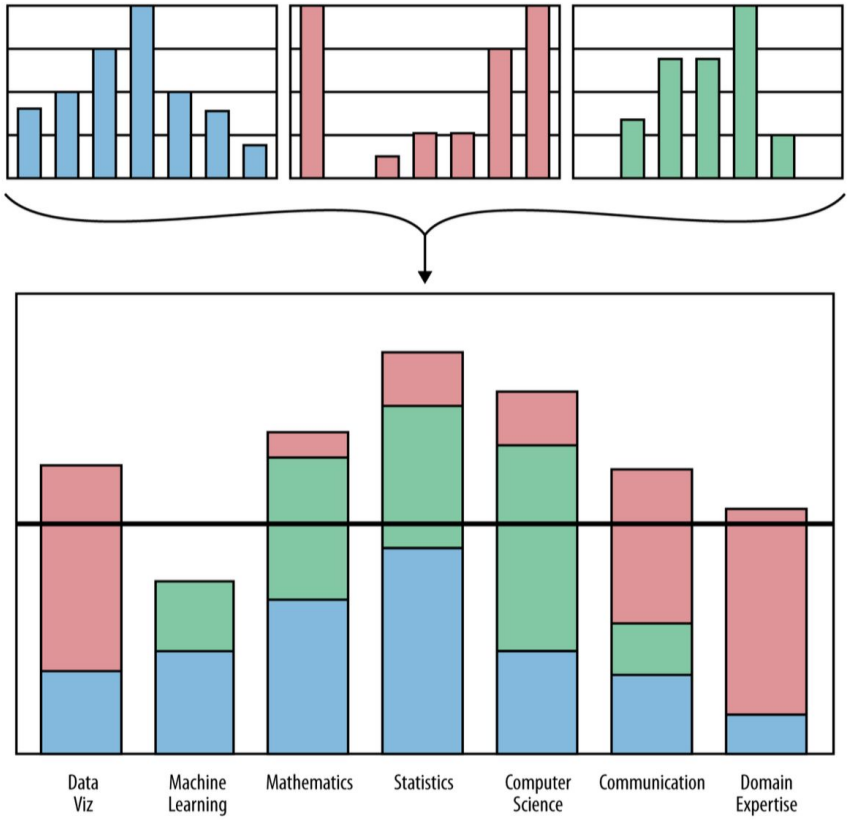
...or **unicorn**?

One Data Scientist



Source: Doing Data Science - Schutt -O'Neill

No one person...



...can be the perfect data scientist, so **we need teams!**

Our Smart Manufacturing Team

- 2 Data Scientist
- 2 Industrial Engineers
- 1 Product Engineer
- 1 Quality Engineer
- 3 Software Developers

Agile Team

iterative sprints (15 days)

user centric approach

- Local Analyst - Developers in each factory

Long Tail effect

How should I go about getting started with Data Science?

1. What is my pain?
2. Can this issue be solved with data?
3. If so... do I have data?

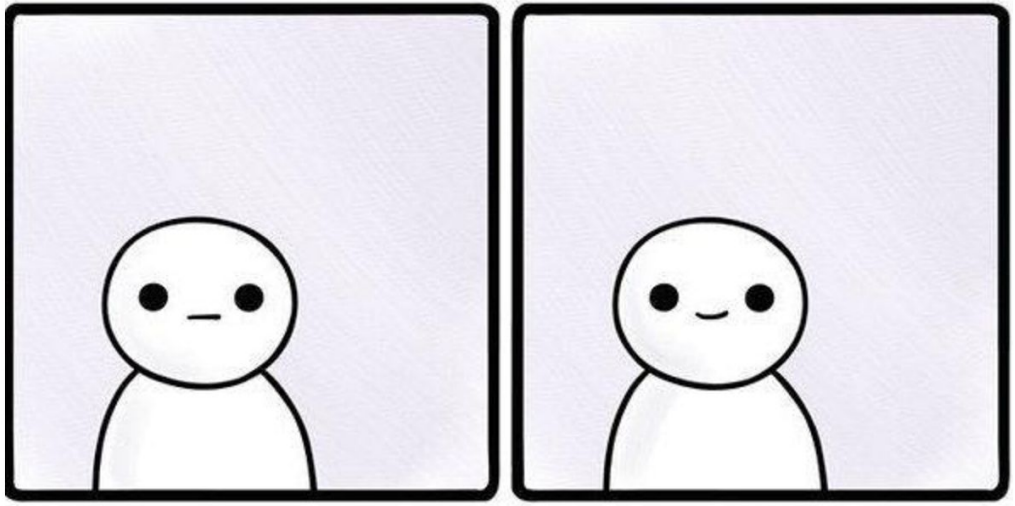
How should I go about getting started with Data Science?

A combo of Ind. Eng. & IT folks can evaluate external partners solutions

1. Start promoting solutions and tools for **data exploration** for domain experts (open source tools are great)
2. **Stay focus** on your major pain
3. Ideally an internal Lead Data Scientist could be beneficial
4. Start with Smart **analytics** first (no need for complex ML)

Lessons learned

1. **User centric** approach: factory shop folks are key
2. Provide tools for **data exploration** to factory folks
3. **Descriptive analytics** (as close as real time as possible) can go a long way
4. Make sure insights have actions **that follow**



“

We could do it this way

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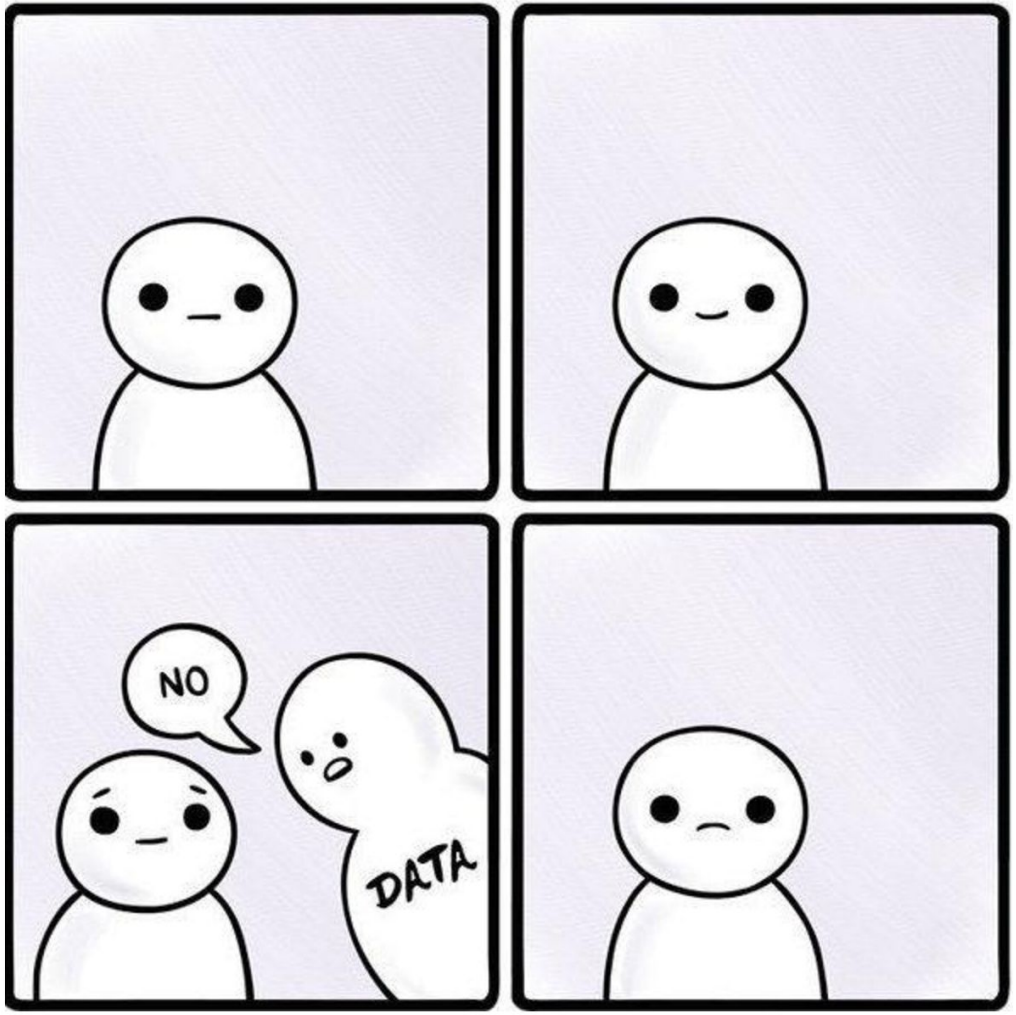
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