Predicting Customer Behavior Using Big Data Analytics with MATLAB in the Cloud

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Key Takeaways

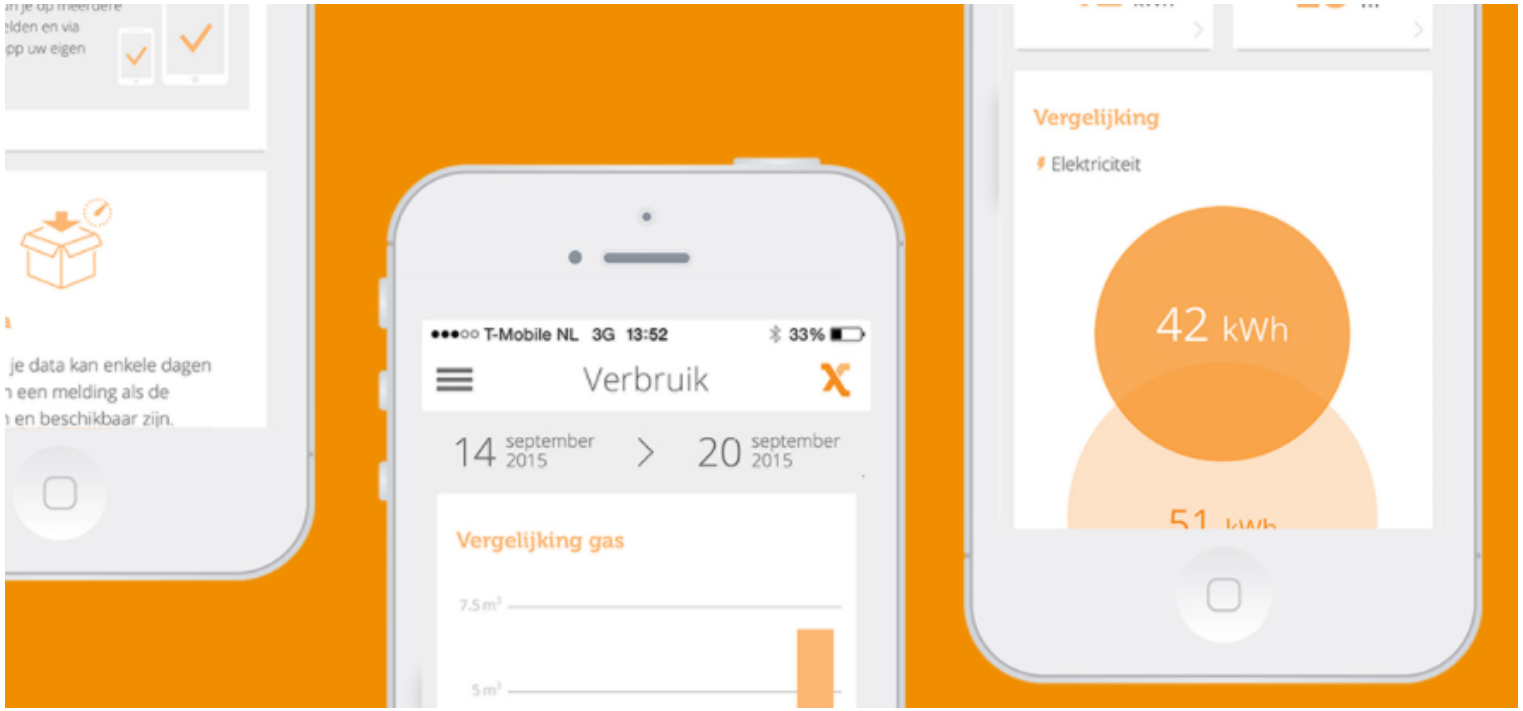
- Fast scalability and broad community support
- Integration with other languages
- Calculations up to 20x faster
- Make the impossible possible
- Use a tool (including MATLAB) where it’s good at!

NLE (formerly known as: Nederlandse Energie Maatschappij)

- Largest independent energy and utility service provider in NL (Energy/Broadband/Boiler services, etc)
- Migrating to a multi-utility service provider

My role:

- Data Science department
- 5 people
- Small and lean organization



Innovation Challenges and Achievements

- *Goal: inference about customer behavior in response to actions by company*
  - *Predictions on customer level instead of group*
  - *Fast iterations for quick model optimization*
  - *Maximum level of granularity*
- Calculations became slow
- Could not forecast long periods due to memory limitations (on-disk caching makes things very slow)
- Achieved boundaries of local optimization (changed data-types where possible to lower precisions etc.)

Result:

- We can now run the calculations in 10-15 minutes instead of the 5-8 hours we had before

How did we get there and leverage MathWorks

- Maximum parallelization and unlimited scalability
- Low cost due to the usage of EC2
- Only pay for what we use to keep costs low but performance high

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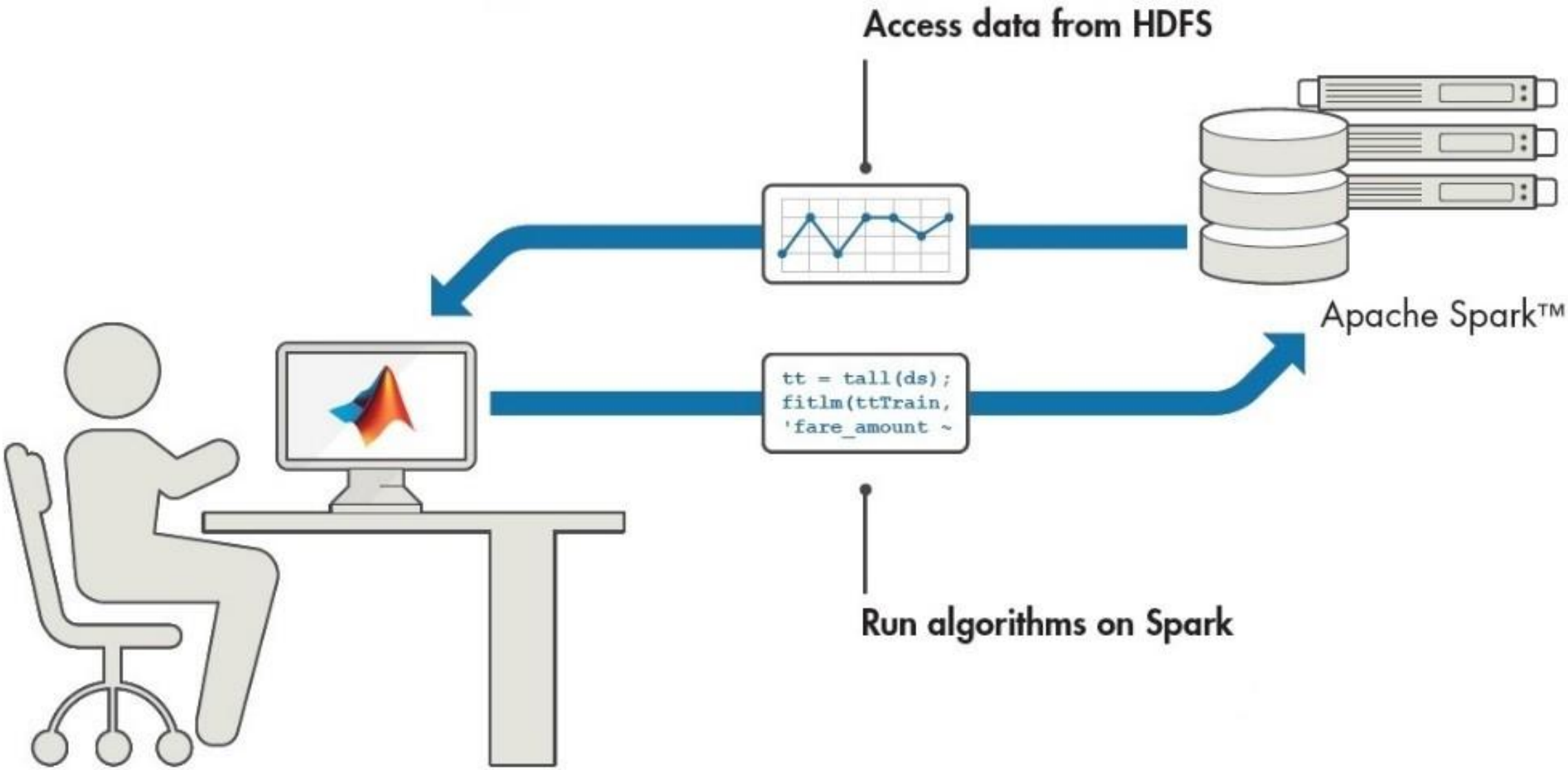

How did we get there and leverage MathWorks

- Maximum parallelization and unlimited scalability
- Low cost due to the usage of EC2
- Only pay for what we use to keep costs low but performance high
- MATLAB spark integration very easy
- Approximately 20x faster runs
- Converting to Spark took 3 days thanks to MATLAB toolkit

Lessons Learned

- Make sure to read the documentation thoroughly before starting
- Spark configuration can be quite difficult, make sure to understand the concepts
- First optimize locally then parallelize in Spark
- Only use Spark when you really need it, MATLAB out of the box performance is enough for most usage

Concluding Remarks

Tips

- Start off by trying some small things
- Read the documentation thoroughly
- Understand the spark concepts

Future plans

- MATLAB full PySpark (Python-Spark) integration for full leverage of spark platform. (f.e. Spark SQL to MATLAB)

Questions?