BIGcoldTRUCKS: BIG data analytics for COLD chain logistics optimization in refrigerated TRUCKS

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Project awarded with 10k voucher for technical support – no direct financial support was received.

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Dissemination level: Public
Disclosing Party: Project consortium
Recipient Party: European Commission

Spin-off of the University of Murcia (Spain) with more of 10 years of experience on the design and development of monitoring and control products and specialises R&D fields of Internet of Things, Security and Data Analytics

Services - To develop intelligent solutions for smart city use cases such as: energy efficiency in buildings, parking control, garden irrigation, and this kind of solutions that involve applying AI to IoT

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OdinS

Let us invent Smart Solutions

Scientific concept and motivation

Use case: to develop an intelligent solution for the optimisation of the transportation of perishable items (cold chain logistcis)
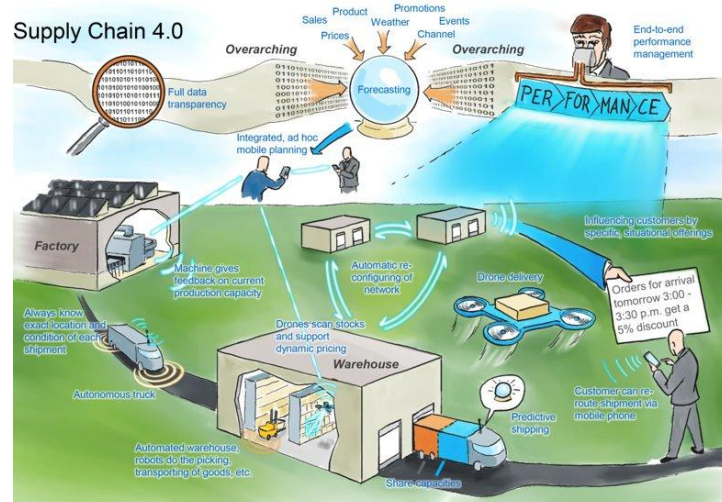
Goal: Provide a descriptive and predictive tool that can help in:
- Organise storage
- Organise trips
- Detect quality loss

Previously
- Data from the trips of a big company
- Simple, isolated shiny dashboard (R)

Needs
- ## Data management, storage and access
- ## Access to HPC for Machine Learning

Image source: https://www.mckinsey.com/business-functions/operations/our-insights/supply-chain-40--the-next-generation-digital-supply-chain

Integrations with EOSC-hub: Data management, storage and acess

The Poznan Supercomputing and Networking Center supported us:

- Choice of data storage system according to our needs: ElasticSearch (store, search, analyse)
- Provision of a machine with ElasticSearch installed and secure access to it
- Guidance through the process of code adaptation and query creation

- Easy connection to R through 2 packages: elasticsearchr and elastic
- Easy and automatic data indexing – scalability: https://youtu.be/xItDcAvyvak

|	NoElastic	Elastic	Improvement (%)
Product's ranking	1,107	0,022	98
Product's ranking	1,03	0,057	94
Groups of product's ranking	1,493	2,47	-65
Groups of product's ranking	1,55	4,578	-195
Trip durations	3,444	1,697	51
Seasonality of product's demand	1,163	0,051	96
Geographic representation	0,978	0,062	94

Retrieval times for 1 month of data

Integrations with EOSC-hub: Access to HPC for Machine Learning

IFCA
Instituto de Física de Cantabria

The Instituto de Física de Cantabria (IFCA) gave us access to the **DEEP training facility*** and supported the whole process.

deep
Hybrid DataCloud

- Development of static demand prediction models (ARIMA and LSTM) in the **DEEP development deployment (Jupyter)** that counts with GPUs.

- Guidance and support in order to deploy the models as a service in the **DEEPaaS API**. Train and predict steps are implemented and integrated in our dashboard
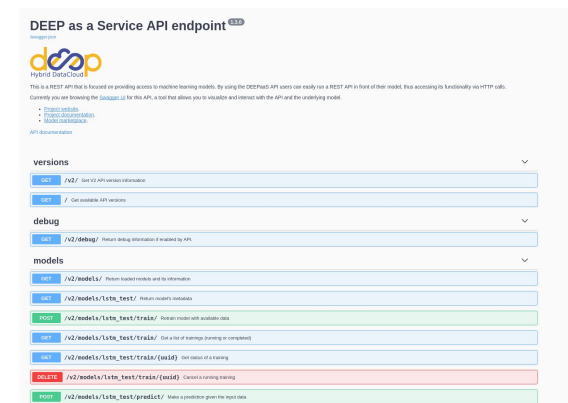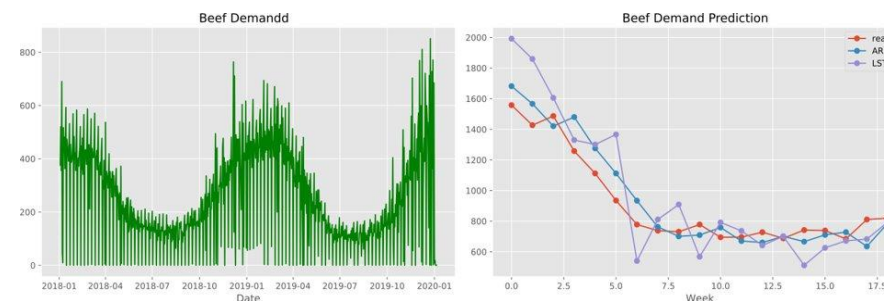
We will see a working prototype of the dashboard that is focused on the analysis of cold chain logistics data and that is connected to Big Data tools: ElasticSearch and the Deepas service that **ease data access** and provide **HPC capacities**.
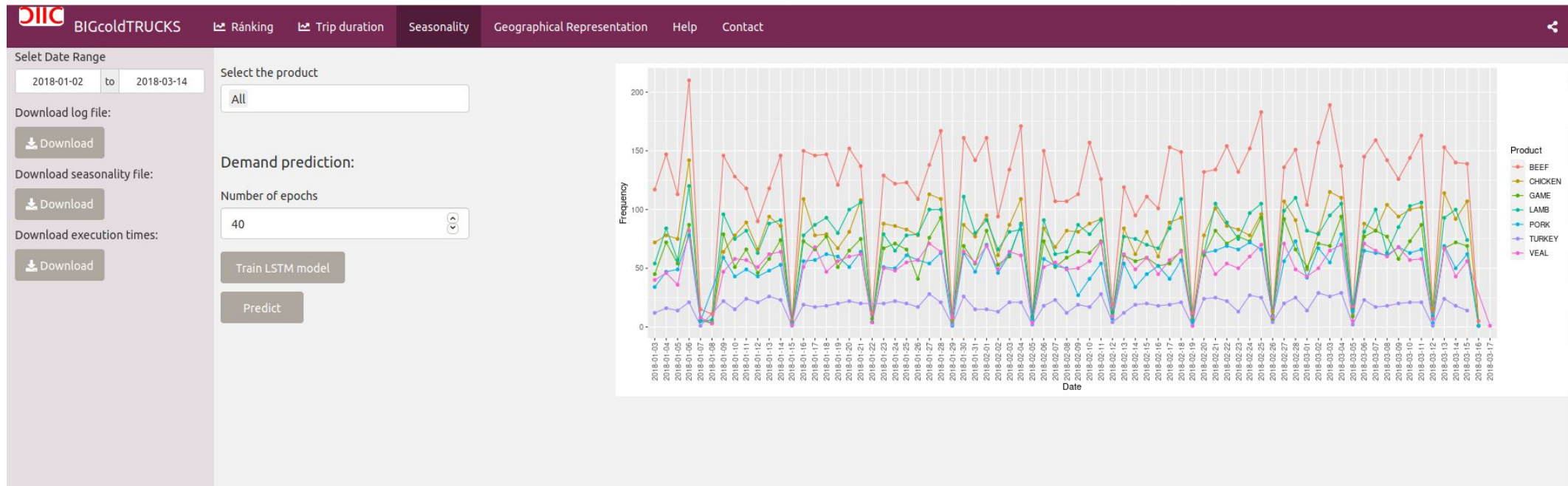
Thank you
for your attention!

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Questions?

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