

# *HOBBIT*

## *A Brief Overview*

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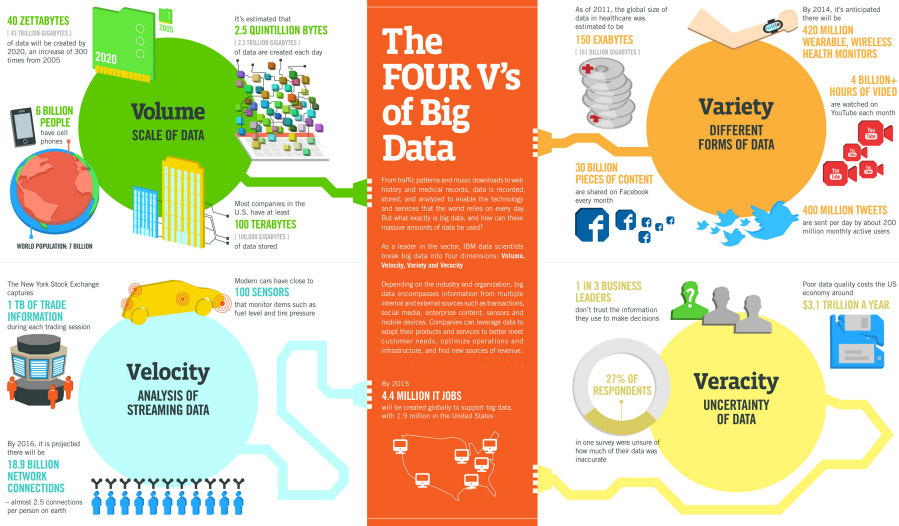
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(Horizon 2020, GA No 688227)



BDV PPP Summit  
Riga, June 27th, 2019

# Introduction

## A Lot of Data



Sources: McKinsey Global Institute, Twitter, Cisco, Gartner, EMC, SAS, IBM, MEPTEC, QAS

<sup>1</sup><http://www.ibmbigdatahub.com/infographic/four-vs-big-data>

# Introduction

## A Lot of Tools

The Dataflog Open Source Landscape 2.0

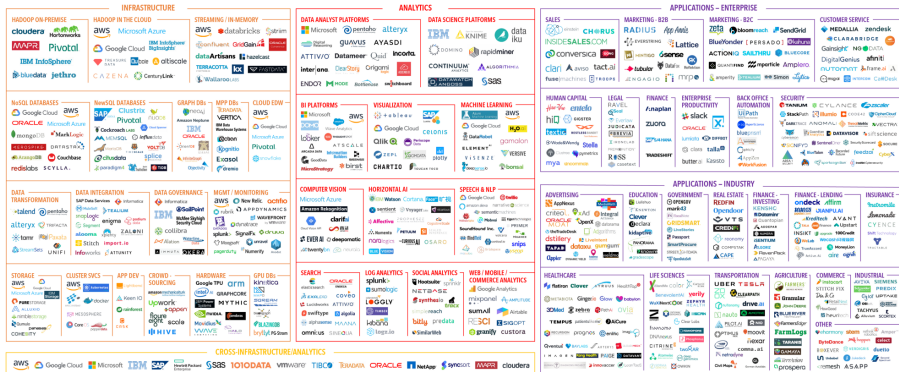


<sup>2</sup>[https://cdn.dataflog.com/cms/os\\_big\\_data\\_open\\_source\\_tools-v2.png](https://cdn.dataflog.com/cms/os_big_data_open_source_tools-v2.png)

# Introduction

## A Lot of Tools

### BIG DATA & AI LANDSCAPE 2018



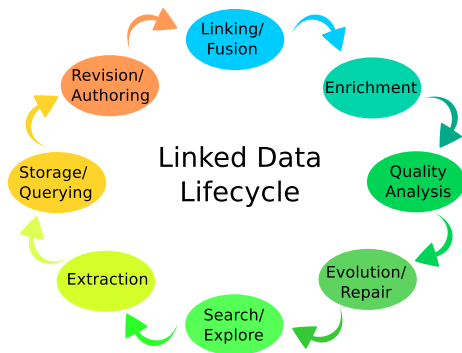
Which tool(s) should I use  
for my use case?



- Where are the current bottlenecks?
- Which steps of the data lifecycle are critical?
- Which solutions are available on the market?
- Which key performance indicators are relevant?
- How well should tools perform?
- How do existing solutions perform w.r.t. relevant indicators?



- Research project from 2015 – 2018 (Horizon 2020, GA No 688227)
- Focus on Big Linked Data
- Cover the business-critical steps of the Linked Data lifecycle
- Used by a growing number of companies
- Mature and maturing technologies





### 1 Gathered real requirements

- Focussed on industrial requirements
- Gathered relevant performance indicators
- Gathered relevant performance thresholds
- Gathered real datasets





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  - Gathered real datasets
- ❷ Developed benchmarks based on real data
- ❸ Provided universal benchmarking platform
  - Comparable results
  - Hosted as a free-to-use online instance



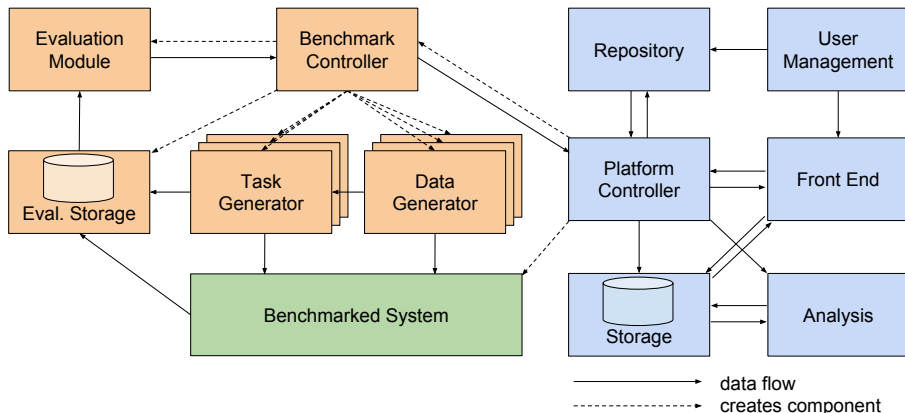
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- ❹ Periodic benchmarking challenges and reporting



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  - Comparable results
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- ❹ Periodic benchmarking challenges and reporting
- ❺ Created an association (Special Group 7 of Task Force 6)

# Section 1

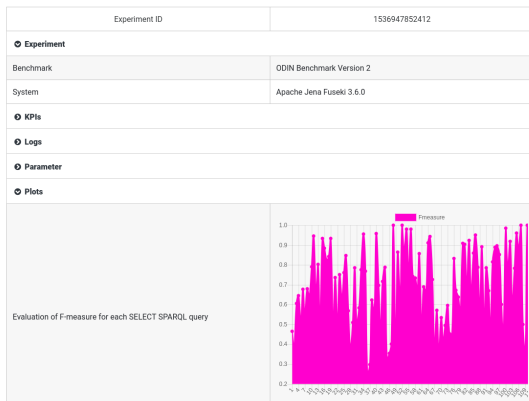
## *Project Highlights*



- Scalable open-source benchmarking platform
- Local, distributed and remote (AWS) deployment
- First FAIR platform for benchmarking Big Linked Data in a holistic manner

- ★ 5 mimicking algorithms
- ★ 52 benchmarks
- ★ 200+ systems
- ★ 14 challenges  
DEBS GC 2017 and 2018
- ★ 300+ users
- ★ 13K+ experiments

### Experiment Details

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## Section 2

# *Benchmarking Machine Learning*

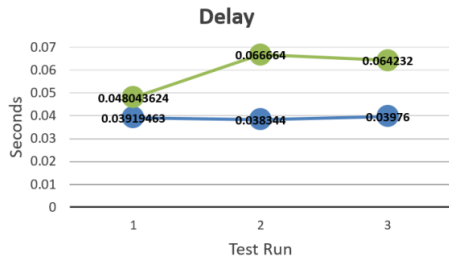


- The task: find anomalies in molding machine sensor data to predict maintenance intervals (predictive maintenance).
- Mimicking algorithm based on real data
- Data was streamed as in the real world
- Participants had to use Markov Models to identify anomalies
- 14 Participants, 7 made it into the last round



# Benchmarking Machine Learning

SML Benchmark v1 for DEBS GC 2017



- The task: predictions about ship routes based on AIS data
  - Spatio-temporal streaming data
  - Predictions for vessels' destinations and arrival times



Team	Earliness rate	A	Working time (sec)	B	Total Q1
University of Iasi	0.685	1	99	2	1.25
University of Illinois	0.672	2	86	1	1.75
Jean Monnet University	0.668	3	149	5	3.5
Chungnam National University	0.653	4	102	3	3.75
University of Iasi (2nd)	0.647	5	157	6	5.25
Israel Institute of Technology	0.5	6	129	4	5.5
Dresden University of Technology	-	-	-	-	-
Insight Centre	-	-	-	-	-
University of Carthage	-	-	-	-	-

Team	Mean Absolute Error (min.)	A	Working time (sec)	B	Total Q2
University of Iasi	959.839	1	100	2	1.25
Jean Monnet University	1099	2	145	4	2.5
Chungnam National University	1251.15	3	100	2	2.75
Israel Institute of Technology	1493.18	4	133	3	3.75
University of Illinois	5425.53	5	86	1	4.75
University of Iasi (2nd)	1705.35	6	164	5	5
Dresden University of Technology	-	-	-	-	-
Insight Centre	-	-	-	-	-
University of Carthage	-	-	-	-	-

Team	Q1	Q2	Total Score
University of Iasi	1.25	1.25	2.5
Jean Monnet University	3.5	2.5	6
Chungnam National University	3.75	2.75	6.5
University of Illinois	1.75	4.75	6.5
Israel Institute of Technology	5.5	3.75	9.25
University of Iasi (2nd)	5.25	5	10.25
Dresden University of Technology	-	-	-
Insight Centre	-	-	-
University of Carthage	-	-	-

## Section 3

### *Future Directions*

- KnowGraphs (Innovative Training Networks (ITN))
  - 4 years, starting in October 2019
  - 15 Early-Stage Researchers (ESRs)
  - HOBBIT will be used as central benchmarking platform
  - Further datasets will be integrated (e.g., UICML datasets)
- RAKI (BMW project)
  - 3 years, starting in September 2019
  - HOBBIT will be used for evaluation
- More projects pending



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  - More projects pending
- Further development of the HOBBIT platform
- HOBBIT is open for the community! Benchmarks, systems, datasets can be added
  - Not limited to linked data

## HOBBIT offers

- Scalable benchmarking
- Based on real world data in an
- Extendable,
- Open source platform
- Following the FAIR data principles

<http://project-hobbit.eu/>  
<https://dice-research.org/about/>

SUMMARY

