Want to become a green cognitive business ?

WikiNet

Cognitive tool for the selection of technologies for the remediation of contaminated sites

Remtech 2016

Topics

- What is Big Data ?
- Why using a Cognitive Technology ?
- Cognitive tool for the selection of a remediation technology;
- Benefits;
- Timeline.

Big Data

Big Data…?

No…! That is Big Data !

Big data is an evolving term that describes any voluminous amount of data that has the potential to be mined for information.

Big Data

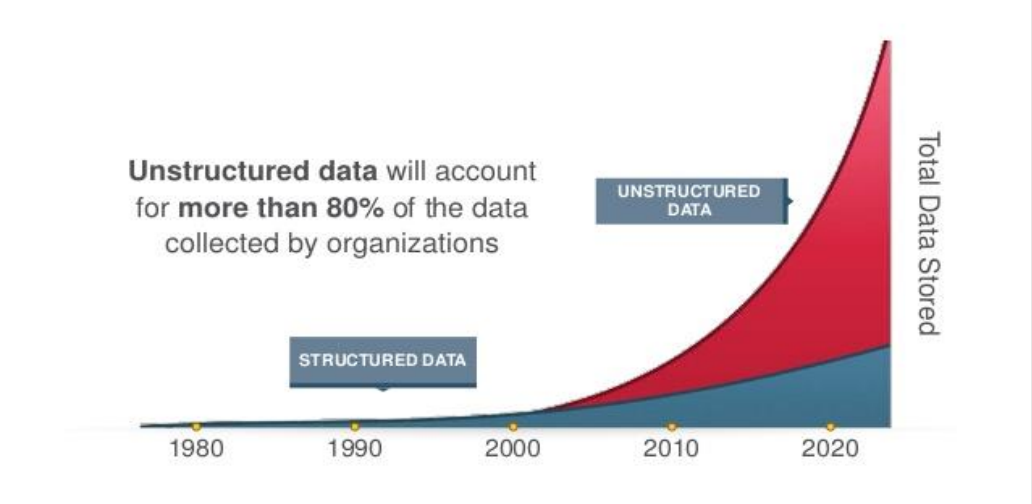
- Highly various data sources;
- Structured and unstructured data;
- Large amount of data to process;
- Information complexity;
- Laborious litterature review;
- Rapid evolution of data sources;
- Lot of time is required to integrate available information;
- Laborious integration of all data sources;

Big Data

- Expertise and site assessment reports;
- Environmental databases;
- Analytical results;
- Scientific papers;
- Photographs;
- Drawings;
- Charts;
- Chromatograms;
- Different formats : html, .xls, .pdf, .doc, .jpg, etc.

Big Data

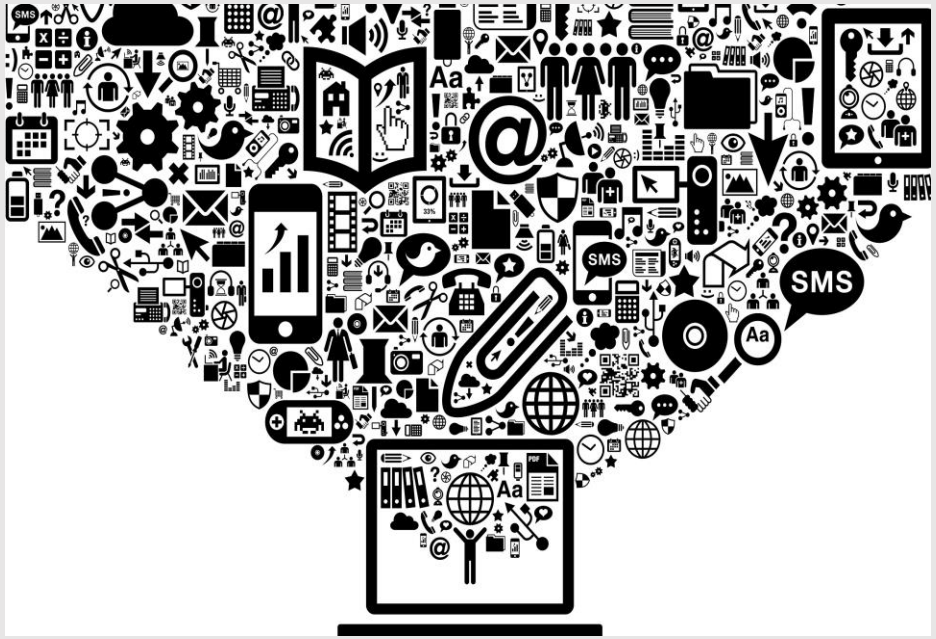
- 90% of the data in the world today has been created in the last two years alone.

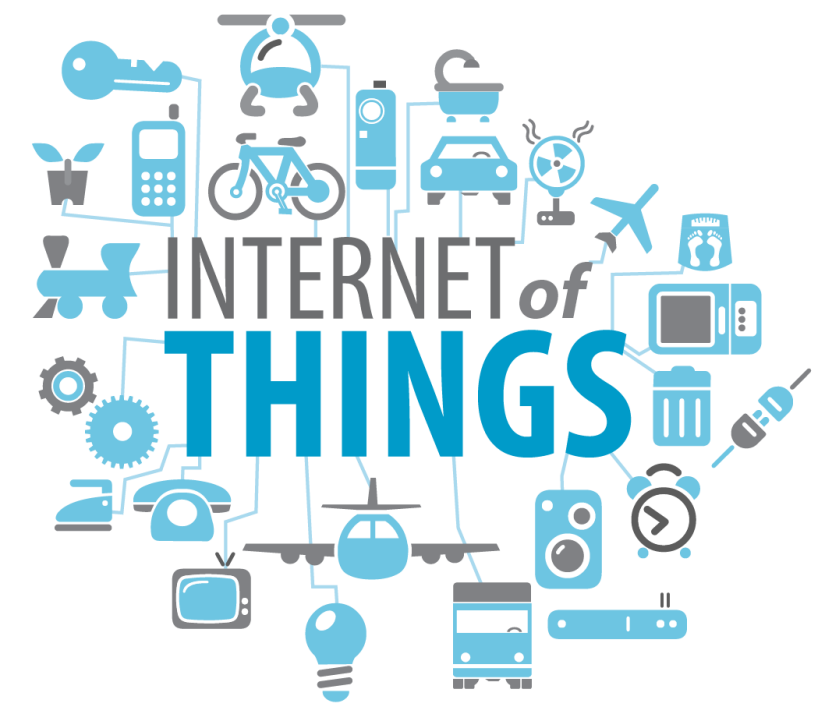


- Dark Data : >80% of the information collect, process and store during business activities but fail to use for other purposes.

Big Data

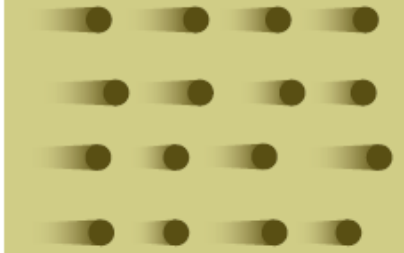
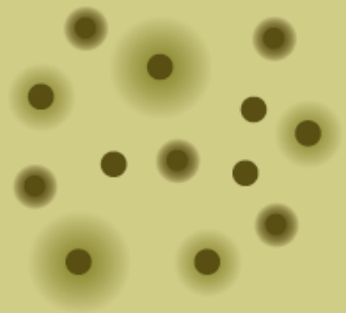
- 80% of data is unstructured. Can not be processed or exploited by conventional softwares;





- Internet of Things (IoT) : data collected by physical devices, vehicles, sensors, smart phones, etc.

The Four V's of a Big Data Problem

Volume	Velocity	Variety	Veracity
			
Data at rest	**Data in motion**	**Data in many forms**	**Data in doubt**
Terabytes to exabytes of existing data to process	Streaming data, milliseconds to seconds to respond	Structured, unstructured, text and multimedia	Uncertainty due to data inconsistency and incompleteness, ambiguities, latency, deception and model approximations

Solutions to manage Big Data

IBM WATSON

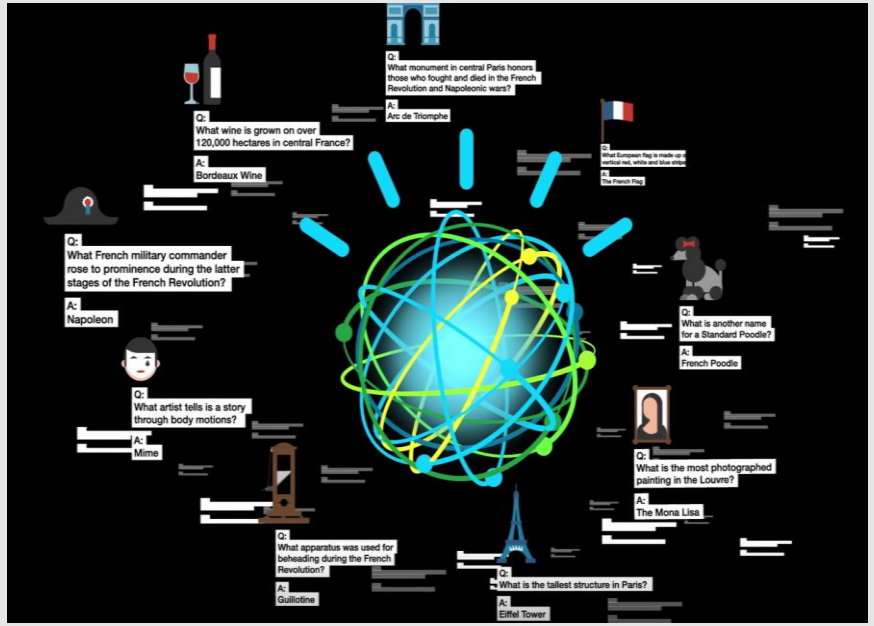
Traditional technology

Cognitive technology

Cognitive technology- IBM Watson

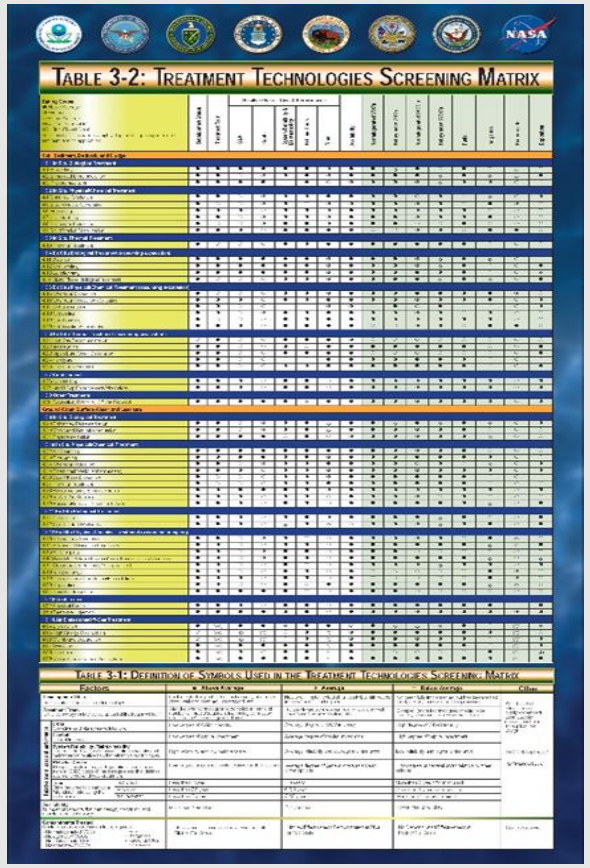
- Technology that uses **natural language processing** and **machine learning** to enable people and machines to interact more naturally to extend human expertise :

  - Watson can process enormous amount of data and information in seconds;
  - Watson can understand documents and context;
  - Watson learns and gets better over time;
  - Watson is constantly updating his knowledge with new incoming information;
  - Watson generates hypothesis;
  - Watson generates answers with confidence levels;

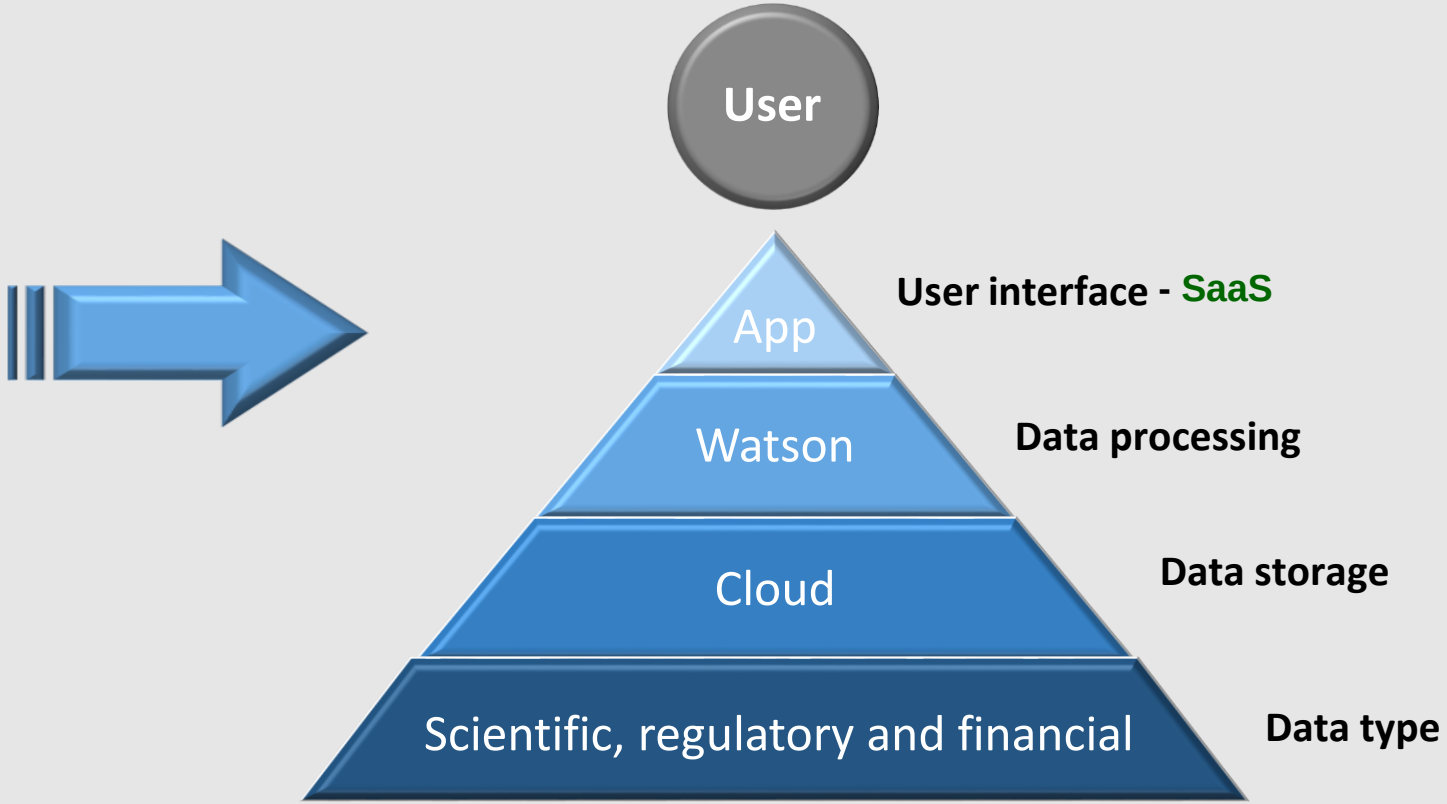



Which technology performs the best for 1,4-dioxane ?
Which technology is greener to treat petroleum hydrocarbons ?
How many remediation technologies can treat metals ?
Is natural attenuation considered as a remediation technology ?
Are there any technologies available to remediate a site contaminated with PAH's, phenols and metals ?

Remediation technology selection tools

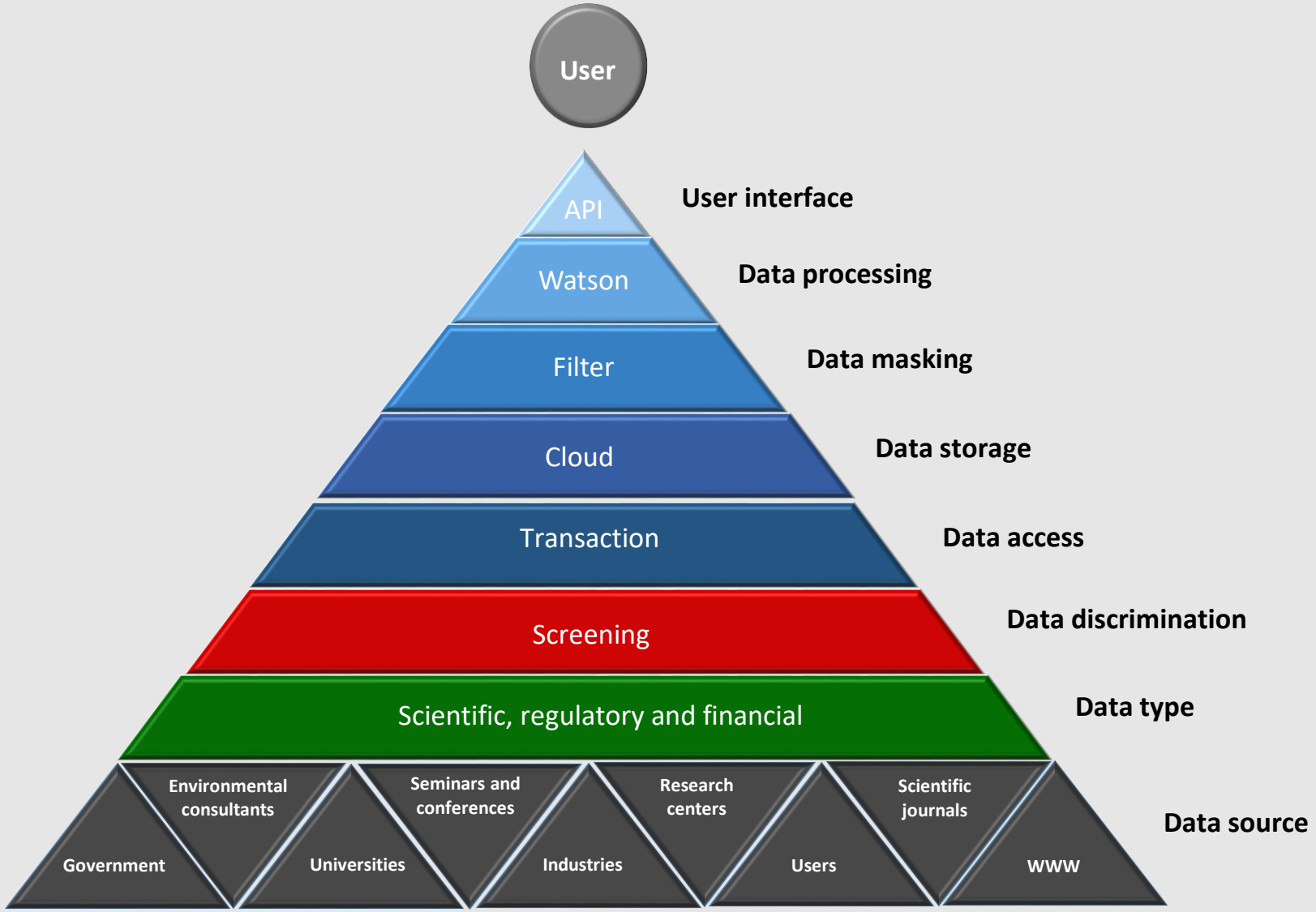


Traditional technology

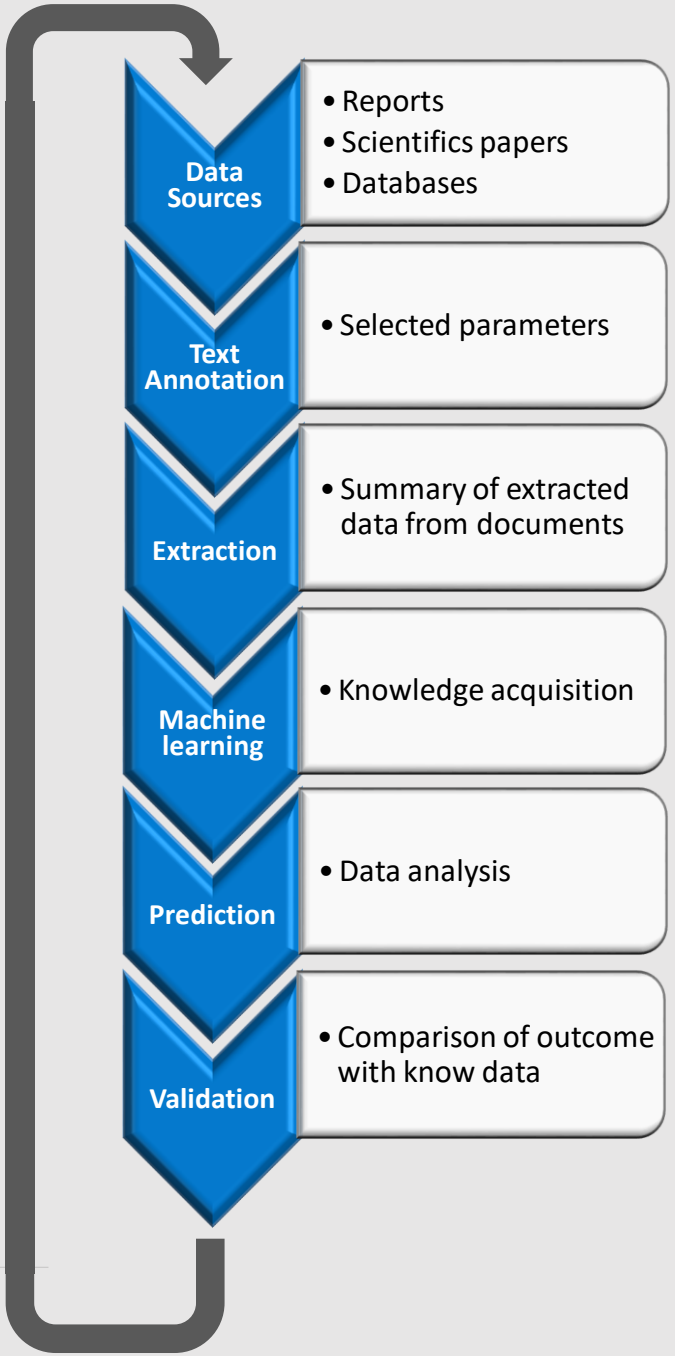


Cognitive technology

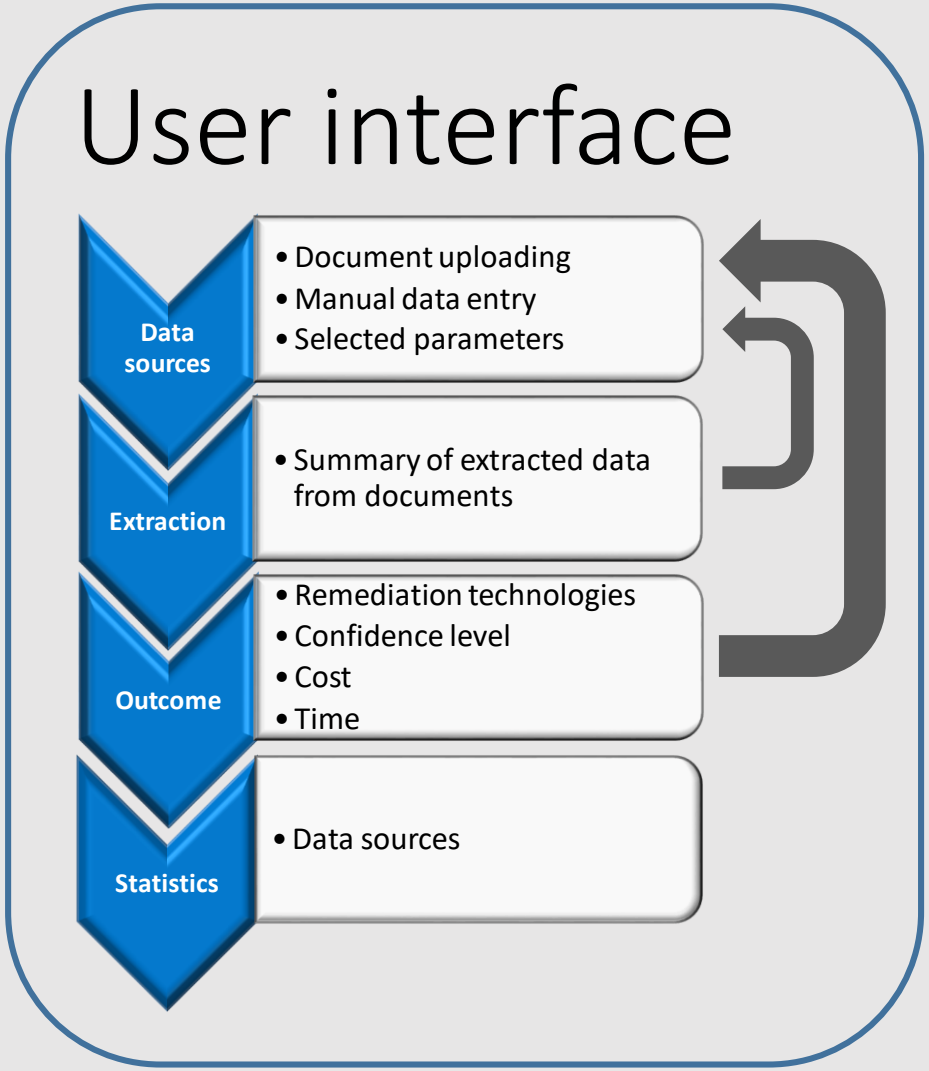
Overview of the application



Machine learning process



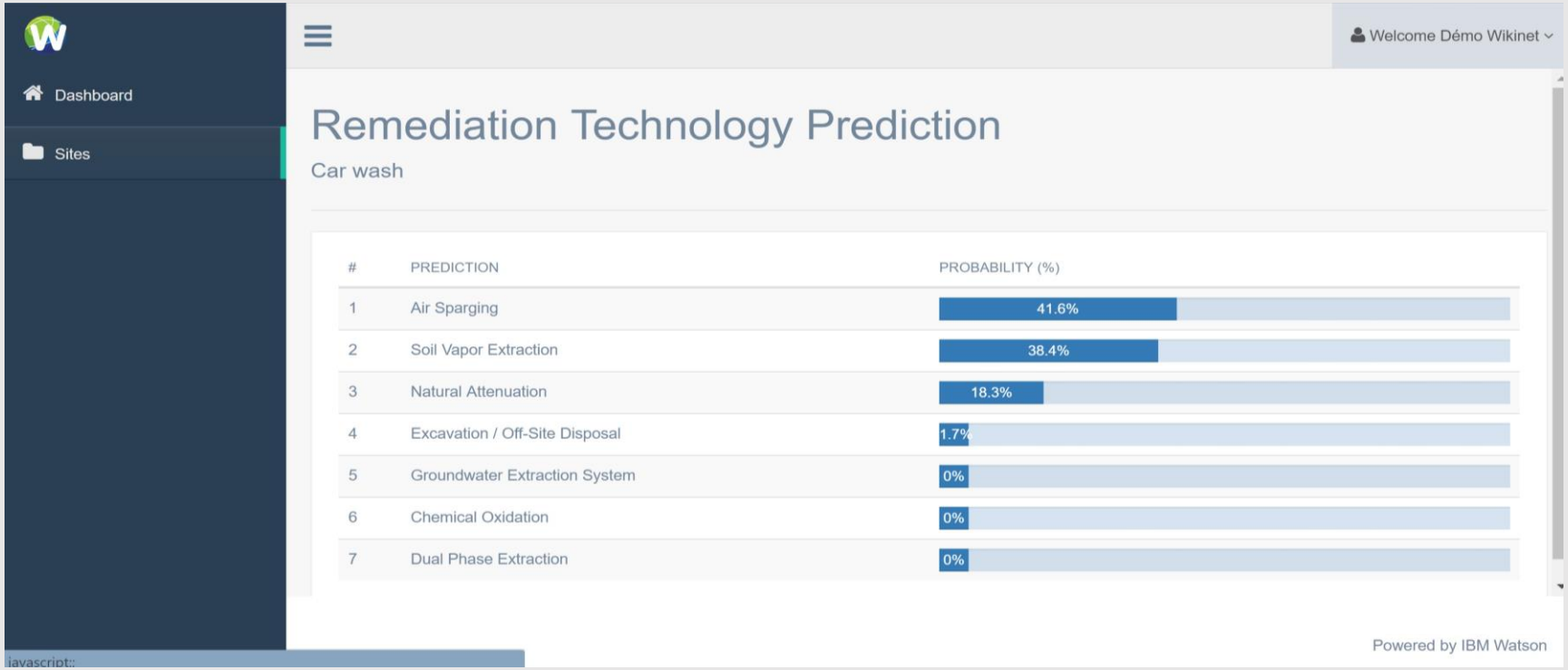
User interface



Selected parameters

Remediation technologies
Contaminants
Concentration
Soil type
Depth range of impacted soils
Plume area
Water Contamination
Depth of groundwater
NAPL information
Site location
Facility type
Number of drilling, test pits, monitoring wells
Cost
Time
Regulation
Etc.

Outcome



Other available informations :

- Remediation costs and timeframe estimates;
- Documentation and data sources access;

Benefits

- **User**:
  - Rapid access to specialized and various information;
  - Optimization of the time required to identify a remediation technology;
  - Quick access to domain experts.

- **Entreprise**:
  - Better selection of a remediation technology;
  - Lower uncertainty and business risk associated with the selection of a remediation technology;
  - Improved knowledge for the development and the use of new technologies;
  - Development of new added value services.

Timeline


2016
2017
2018
Development - App #1
Go to market
Evolution
Development - App #2
Go to market
Evolution
Development - App #3

Partners

ARCADIS

UNIVERSITÉ LAVAL

IBM WATSON

Questions ?

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