



Guide to Machine Learning

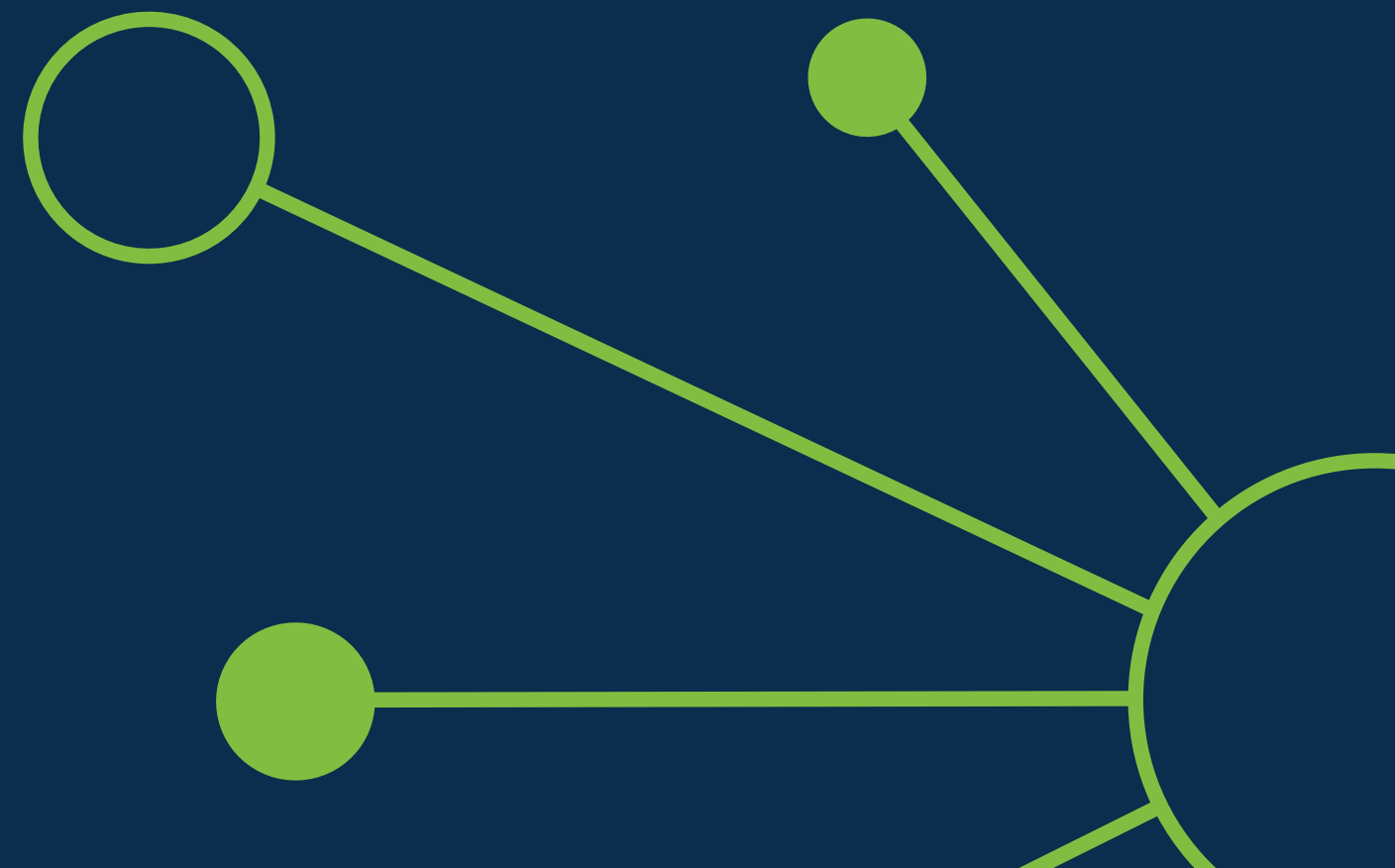
This guide discusses typical approaches to implementing Machine Learning and the importance of data quality for successful outcomes.



This document is interactive. There is additional information behind the buttons.

Roll over or tap to reveal

START



A successful Machine Learning strategy can make all the difference to your business

From innovation and product development to customer service and aftersales, Machine Learning enables modern organisations to achieve more. Read on to discover what it is, why it helps, and how best to operationalise it.

Machine Learning is defined as:

A field of study that gives computers the ability to learn without being explicitly programmed
– Arthur Samuel

[Learn more](#)

Samuel discovered this way back in 1959



[Learn more about Arthur](#)

IT'S ALL VERY LOGICAL WHEN YOU THINK ABOUT IT

- This process occurs in three stages: **teach, learn and predict**
- The purpose is to improve performance without the need for human intervention
- The idea may sound new, but the application isn't



[How does machine learning happen?](#)



So, how does machine learning happen?

Put simply, machine learning 'learns' based on its exposure to external information. Like us, it makes decisions according to the data it interacts with - its experience of the world. But unlike us, it uses statistical probabilities to determine each outcome. These statistics are supported by various algorithms modelled on the human brain.

In this way, every prediction it makes is backed up by solid factual, mathematical evidence derived from previous experience. It's all very logical, when you think about it.

How Machine learning impacts our daily lives

The idea may sound new, but the application isn't.
Machine learning already impacts many areas of our daily lives

including:



**HANDWRITING
RECOGNITION**



PHOTO TAGGING
(auto recognition of faces)



SEARCH ENGINES
(ranking results
based on interest)



**SPAM FILTERS
IN EMAIL**
(adding to spam list
based on behavior)



**ONLINE SUGGESTIONS/
RECOMMENDATIONS
FOR PRODUCTS
AND ACTIVITY**
(eg Netflix)



SELF DRIVING CARS

*The possibilities
are endless!*

Next Page: The 3 Principles of Machine Learning





Machine Learning uses three central principles:

1

It relies on data, and usually LOTS of it!

2

It uses probability to predict outcomes

3

It learns in phases, through systematic probabilities and predictions

How do we implement Machine Learning commercially?

Typically, there are three stages to deploying a Machine Learning project in business:

1. TEACH



2. LEARN



3. PREDICT



Next Page: Democratising Machine Learning Capabilities >>>



How to develop a successful Machine Learning strategy

Now we know what machine learning is, how it works and what it can do, let's consider how we can bring it to life successfully in business. Machine Learning depends on data - and the more reliable, accurate, up-to-date and comprehensive that data is, the better the results will be. This means it's vital to prepare data properly. As with many things, what you get out depends on what you put in.

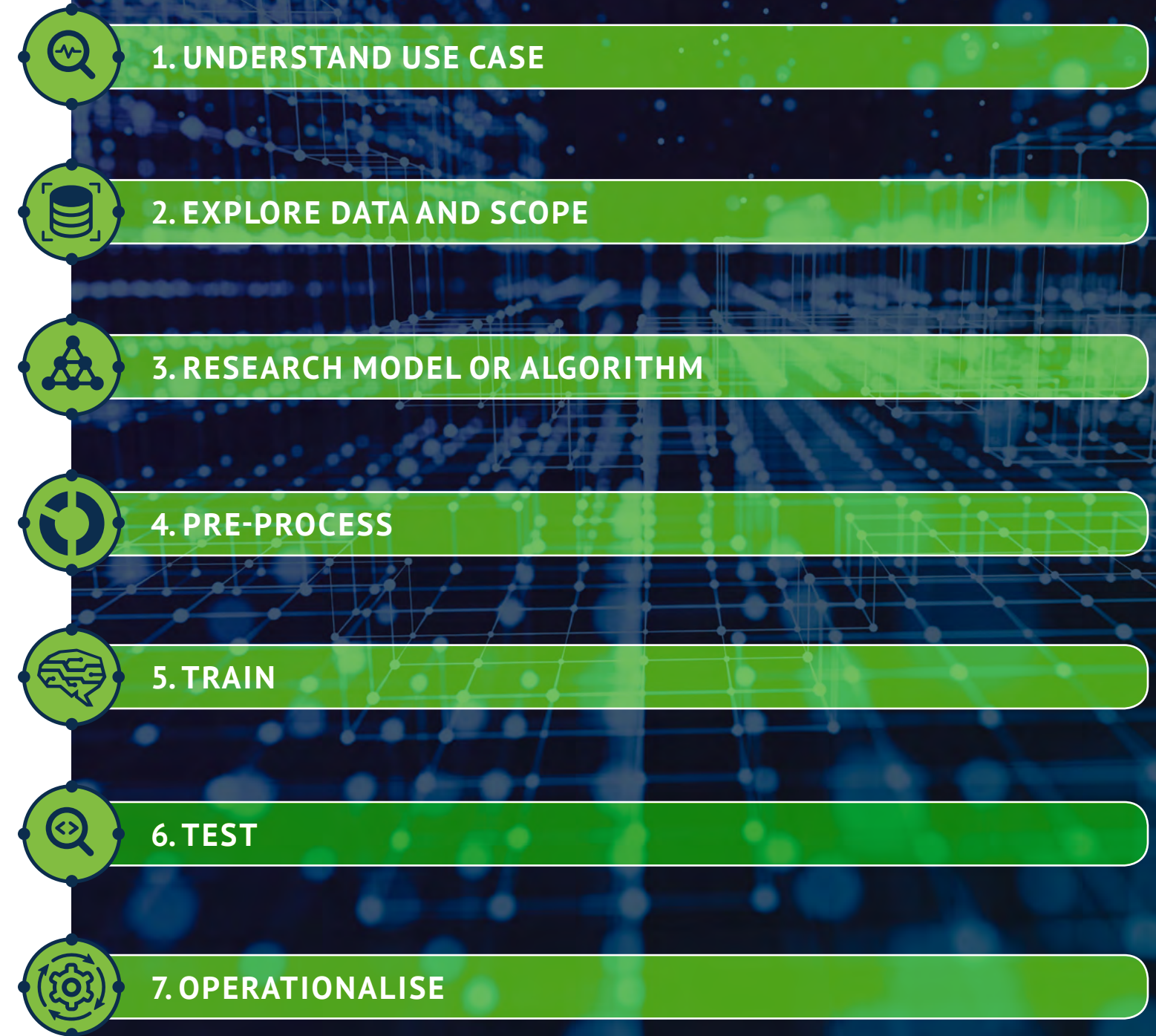
Machine Learning can appear complex and hard to deliver. But if you have the right skills and knowledge in place from the beginning, there is nothing to worry about.

A background in general logic and basic programming is vital - together with the ability to choose the right programming language or framework for your needs. A good understanding of core Mathematics will help you manage most standard Machine Learning algorithms effectively - especially Linear Algebra, Calculus, Probability, Statistics and Data and Frameworks. Skills in data engineering are useful, as machine learning is all about data.

**Next Chapter: Who do
you need to involve
along the way? >>>**

Machine Learning development: best practice

[Roll your mouse or click on the green icons]



Who do you need to involve along the way?



Business Analyst



Data Scientist



DevOps

Where does Machine Learning work best?

Machine Learning is best suited to 'problem' tasks, where either:

- A complete logic or formula for achieving that task is not known or does not exist
- Existing programming techniques have not produced the right results or performance
- The amount of data is simply too great to process/ compute conventionally

Common problems Machine Learning addresses:



A lack of structure



Unusual data points



Predicting values



Predicting categories

Next Page: How to solve data problems >>>



Identify your problem - and solve it

By applying the right algorithm through machine learning, you can overcome otherwise complex data challenges.

Typical algorithms include:

CLUSTERING

ANOMALY DETECTION

CLASSIFICATION

REGRESSION

Machine Learning is usually deployed in one of three ways:

Supervised

learning maps input variables to output variables

Un-supervised

learning figures out that certain objects or events relate to the same particular type of behaviour

Reinforcement

learning by trial and error

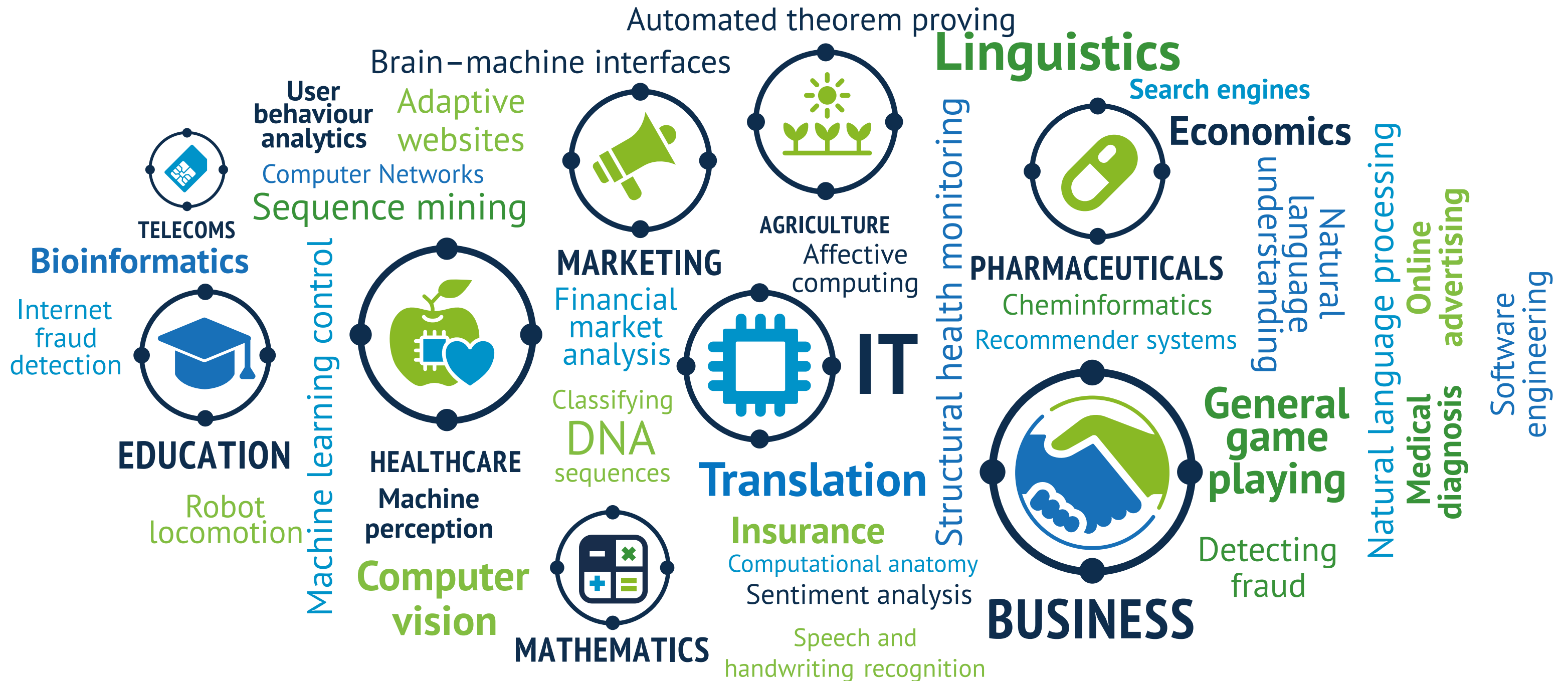
Next Page: Machine Learning at work >>>

ALGORITHMS IN ACTION | an example

Healthcare companies use algorithms to assess the risk that each person presents when calculating their insurance premium. They consider a variety of factors, including age, existing health condition, lifestyle choices, whether they smoke and/or drink, and so on. A qualified prediction is made based on the likely scenarios resulting from these variables. It's based on a series of probabilities - the chance that something will happen to that person's health as a result of their life decisions.



And these days, it's used for an almost endless number of applications!



Next chapter: Operationalising Machine Learning in your business



Deploying Machine Learning to benefit your business

Operationalising Machine Learning can be easier than it sounds. It's all in the preparation, and depends on how you tackle a series of questions: including how to govern and action research findings, how to incorporate this into your Software Delivery Lifecycle (SDLC) and which specific benefits and outcomes you're looking to achieve.

Too often, organisations run Machine Learning initiatives because they've been asked to by the business, without properly considering testing and deployment. As a result, their chosen models are either unfamiliar to IT/DevOps, or incompatible with existing processes. This creates silos and division, as different operational departments struggle to work together. There are no shortcuts: Machine Learning projects should always be inclusive.

The four obstacles to operationalisation - and how to overcome them

Successful Machine Learning initiatives depend on:

- Delivering value
- Bridging any skills or process mismatches
- Ensuring fast time to value
- Being able to scale quickly

By maintaining close communication between your Data Scientist and DevOps teams throughout deployment, you'll increase your chances of a smooth, efficient and effective Machine Learning process.

Options for operationalisation of Machine Learning research



Integrate



Encapsulate



Refactor

Next Page: The Global benefits of Machine Learning >>>



Machine Learning is already benefitting organisations all over the world

Predict customer behaviour more accurately



Make more relevant recommendations



Improve medical prediction and treatment



Real-world case studies – Hover over or click on a logo to read

BAYER CROPSCIENCE AG, now part of BASF



Decision Resources Group (DRG)



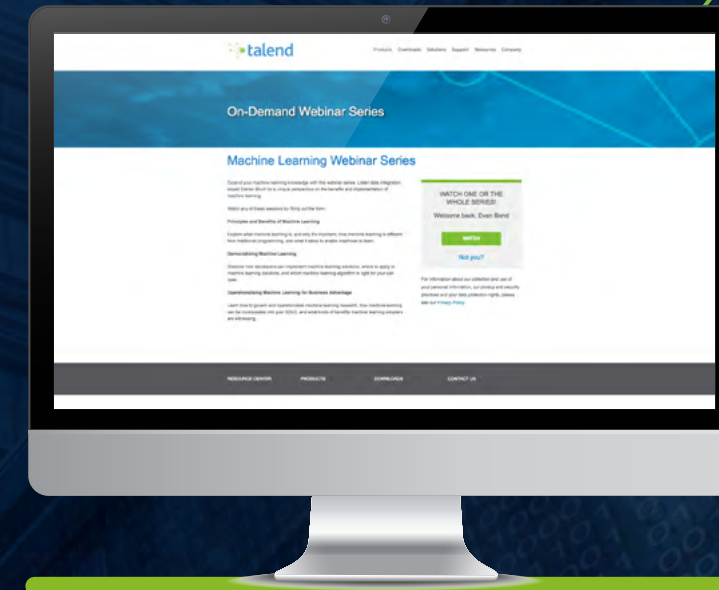
Next chapter: Find out more about Talend >>>



Talend: Making information work for your business

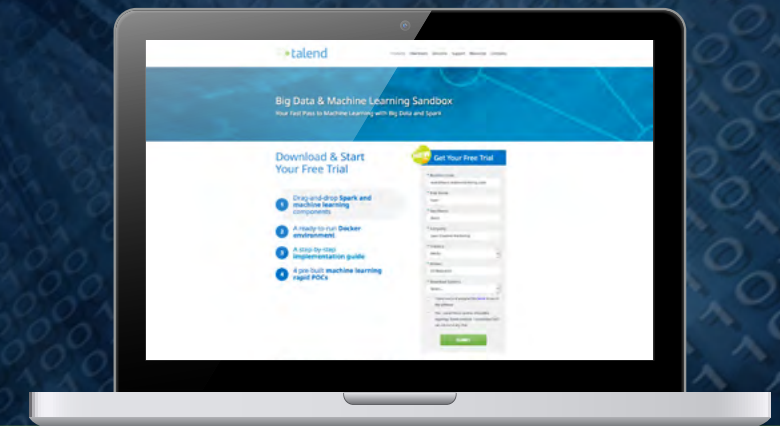
As a leader in cloud integration solutions, Talend frees data from legacy infrastructure and puts it to work for your business. By delivering a single platform that brings all your data together from public and private cloud as well as on-premise environments, we enable your IT and business teams to work more closely and constructively while remaining at the forefront of innovation.

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Learn more about what machine learning can do for your business and your bottom line, in our exclusive webinar series

Watch our webinars >>>



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Start your free trial >>>