

# Chapter 13

## Machine Learning for Business Analytics

**Kağan Okatan**

 <https://orcid.org/0000-0002-0517-665X>

*İstanbul Kültür University, Turkey*

### ABSTRACT

*All these types of analytics have been answering business questions for a long time about the principal methods of investigating data warehouses. Especially data mining and business intelligence systems support decision makers to reach the information they want. Many existing systems are trying to keep up with a phenomenon that has changed the rules of the game in recent years. This is undoubtedly the undeniable attraction of 'big data'. In particular, the issue of evaluating the big data generated especially by social media is among the most up-to-date issues of business analytics, and this issue demonstrates the importance of integrating machine learning into business analytics. This section introduces the prominent machine learning algorithms that are increasingly used for business analytics and emphasizes their application areas.*

### INTRODUCTION

Big data, machine learning and business analytics concepts are trending topics in today's businesses. There have been much discussions going on these topics but there is also a need to explain these concepts. The large data volume does not classify it as just the big data age, because there have always been larger volumes of data than we can effectively work with. What separates the present as the big data age is the change in the behavior of companies, governments and non-profit organizations. During this period, they want to start using all the data they can collect to improve their business for an unknown purpose, present or future (Dean, 2014).

Big Data sources which make big data 'big' are sensors, digitizers, scanners, digital modeling, mobile phones, the Internet, videos, emails and social networks (Yang, Huang, Li, Liu, & Hu, 2017). Data types flowing from these sources in a very large and diverse range include text, geometries, images, videos, sounds and a combination of each. such data can be directly or indirectly converted into purpose-oriented business information.

DOI: 10.4018/978-1-7998-2566-1.ch013

## ***Machine Learning for Business Analytics***

Both academics and practitioners attach great importance to the value that institutions can create through big data and business analytics. This is mainly due to the fact that information technologies, business analytics and related technologies enable organizations to better understand workload and markets” and increase the opportunities offered by abundant data and domain-specific analytics”. Top-performing organizations make decisions based on rigorous analysis more than twice the rate of underperforming organizations and state that analytical insight is used ‘to guide both future strategies and day-to-day operations’ (Sharma, Mithas, & Kankanhalli, 2014).

The irresistible charm of processing big data requires understanding and application in other very important concepts, which is where the real competitive advantage goes. ‘Machine learning’ is a key concept to use the big data in order to boost your enterprise’s marketing and other business operations’ performance. The term ‘machine learning’ is often, incorrectly, interchanged with Artificial Intelligence, but machine learning is a sub field/type of Artificial intelligence. Machine learning is also often referred to as predictive analytics, or predictive modelling.

Mostly the term ‘machine learning’ seems to be intertwined with ‘Artificial Intelligence’, but machine learning is a subspace / type of artificial intelligence. Machine Learning is not a new concept. Machine learning is closely related to Artificial Intelligence. Artificial intelligence becomes possible with machine learning. The term ‘machine learning’ is coined by American computer scientist Arthur Samuel in 1959, is defined yet the ‘computer’s ability to learn without explicit programming’ (Wakefield, 2019). Through machine circulation, computer systems can be classified, clustered, predicted, pattern recognition, and so on. Learn to perform such tasks. To archive the learning process, systems are trained using various algorithms and statistical models to analyze sample data. Sample data is generally characterized by measurable properties called properties, and a machine learning algorithm attempts to find a relationship between properties and some output values called labels. The information obtained during the training phase is then used to identify patterns or make decisions based on new data. Ideal for problems such as machine learning, regression, classification, clustering, and setting association rules. Machine learning is also often called predictive analytical or predictive modeling (Zantalis, Koulouras, Karabetos, & Kandris, 2019).

Machine learning is an activity that allows the computer machine to learn data from data to make data-driven decisions. The machine learning algorithm is used to learn the data to form the decision model. Decision models are then used to decide (Singh, Leavline, Muthukrishnan, & Yuvaraj, 2018). This is the point where machine learning meets business analytics.

A McKinsey global report described Big Data as “Data whose scale, distribution, diversity, and/or timeliness require the use of new technical architectures and analytics to enable insights that unlock the new sources of business value” (Elshawi, Sakr, Talia, & Trunfio, 2018).

Learning algorithms are increasingly used due to their values that make a difference in solving the problems we face in our daily business world. The most prominent features of these algorithms are that they provide solutions or statistical reality to our business problems from experience, especially big data. This explains why machine learning and the use of deep learning are rapidly shifting from laboratory interest to business applications (Al-Garadi, Mohamed, Al-Ali, Du, & Guizani, 2018). The motivation behind this section is to raise awareness of leading machine learning algorithms, which contribute greatly to business analytics.

23 more pages are available in the full version of this document, which may be purchased using the "Add to Cart" button on the publisher's webpage:  
[www.igi-global.com/chapter/machine-learning-for-business-analytics/267249](http://www.igi-global.com/chapter/machine-learning-for-business-analytics/267249)

## Related Content

---

### Internet of Things in E-Government: Applications and Challenges

Panagiota Papadopoulou, Kostas Kolomvatsos and Stathes Hadjiefthymiades (2020). *International Journal of Artificial Intelligence and Machine Learning* (pp. 99-118).

[www.irma-international.org/article/internet-of-things-in-e-government/257274](http://www.irma-international.org/article/internet-of-things-in-e-government/257274)

### Ant Miner: A Hybrid Pittsburgh Style Classification Rule Mining Algorithm

Bijaya Kumar Nanda and Satchidananda Dehuri (2020). *International Journal of Artificial Intelligence and Machine Learning* (pp. 45-59).

[www.irma-international.org/article/ant-miner/249252](http://www.irma-international.org/article/ant-miner/249252)

### Analysis and Implications of Adopting AI and Machine Learning in Marketing, Servicing, and Communications Technology

Priyal J. Borole (2024). *International Journal of Artificial Intelligence and Machine Learning* (pp. 1-11).

[www.irma-international.org/article/analysis-and-implications-of-adopting-ai-and-machine-learning-in-marketing-servicing-and-communications-technology/338379](http://www.irma-international.org/article/analysis-and-implications-of-adopting-ai-and-machine-learning-in-marketing-servicing-and-communications-technology/338379)

### Classification Models in Machine Learning Techniques

Amit Majumder (2024). *Machine Learning Algorithms Using Scikit and TensorFlow Environments* (pp. 1-16).

[www.irma-international.org/chapter/classification-models-in-machine-learning-techniques/335181](http://www.irma-international.org/chapter/classification-models-in-machine-learning-techniques/335181)

### Impact of UAVs in Agriculture

Megha Bhushan and Arun Negi (2023). *Handbook of Research on Machine Learning-Enabled IoT for Smart Applications Across Industries* (pp. 258-268).

[www.irma-international.org/chapter/impact-of-uavs-in-agriculture/326000](http://www.irma-international.org/chapter/impact-of-uavs-in-agriculture/326000)