

Call for Papers



International Journal of Big Data Management

Special Issue on: "Improving Agriculture Productivity and Sustainability through Big Data Management"

Guest Editors:

Dr. Mariantonietta Fiore and Dr. Nicola Faccilongo, University of Foggia, Italy

Prof. Antonino Galati, University of Palermo, Italy

Dr. Maria Carmela Annosi, Wageningen University and Research, The Netherlands

The world is currently witnessing huge changes resulting from continuously growing populations, resource depletion, and environmental and climate change. Therefore, farmers have a double challenge: to increase the quality and quantity of production while simultaneously protecting nature and safeguarding biodiversity through new management strategies and tools more and more oriented towards sustainability (Zaza *et al.*, 2018a). Big data analytics (BDA) tools, together with information and communication technologies (ICTs), are not strictly about primary production (Wolfert *et al.*, 2017), but have an effective impact on increasing the sustainability and productivity of the entire agri-food supply chain (Conto' *et al.*, 2015, Gallo *et al.*, 2014), and even on maintaining a proper level of security and traceability for the products (Ma *et al.*, 2018). Big data has been evolving over the years; it contains all kind of information (Lynch, 2008). For instance, industrial data, storage, transportation, customer behaviours, and so on. BDA with emerged technologies have changed the way companies do businesses (Chen *et al.*, 2019; You, 2019; Cayirci & Rong, 2018), and they now use this data in the management of farming processes. It became the basis of new business models that create new opportunities for using resources more efficiently; make the industry transparent, traceable, trustful and sustainable; reduce the needs of intermediaries and documentation; and upscale internal operations of companies and streamline business processes, which results in higher profit and more satisfaction from customers (Tripoli & Schmidhuber, 2018).

Numerous works prove the importance of advanced technologies and BDA tools in agriculture management. Kamilaris *et al.* (2017) performed a review on current studies in agriculture, which adopted the recent practice of big data analysis, showing, in conclusion, the significant opportunities of big data analysis in the sector. For instance, the data model of Pestana *et al.*, (2005) solves the problem of integrating spatial and temporal data providing information by simplifying semantic interoperability and data analysis in a spatial data warehouse (SDW); Deggau *et al.*, (2010) proposed a system that enriches SDWs with ontologies enabling the identification of the more appropriate SDW through a keyword search. The model developed by Gupta *et al.*, (2013) estimates the crop performance for a specific area, weather and environmental domain and furthermore, the schema of the data warehouse is detailed, providing some structured query language (SQL) example decisional queries. Faccilongo *et al.* (2016) offered environmental friendly and cost-effective solutions involving RFID to ensure the traceability and quality of agri-food products; Zaza *et al.* (2018b), proposed a system that allows the analysis of integrated pest management (IPM) data of different farms to understand some best practices.

However, with the involvement of enormous amounts of data, there may be problems related to security and privacy (Behera & Rasool, 2019; Terzi *et al.*, 2015) while collecting, storing and processing data (Jadon & Mishra, 2019). In addition, one of the main issues that will appear with the increase of the use of big data will be the validity of the data and which of it would be proper or qualified for use in the required big data analysis (Rabah, 2017; Shekhar *et al.*, 2017; Ashutosh, 2012; Stubbs, 2016). The usage of invalid, misinterpreted or unrelated data while performing big data analysis can result in less accurate outputs, expectations or system behaviour, which will affect the total productivity of the agricultural system (Estes, 2016). To overcome these issues, the basic requirements would be establishing techniques that increase the notion of trust (Reyna *et al.*, 2018), improve the efficiency of sustainable agriculture development, and allow the transparent, secure and appropriate provision of data from farms. This can happen passing through agricultural technology providers, working staff and financial sectors, to the end of chain represented by processing and handling entities (Abe *et*

al, 2017; Noyes, 2014). Based on these requirements, the motivation behind this special issue is to explore big data management for agriculture to improve agricultural productivity and sustainability, including identifying the key challenges that are faced by big data management, and using the big data itself. The aim is to identifying problems that can be solved through big data or big data management, and to propose solutions to problems for agriculture production chains. Therefore, we expect to gain from field experts a wide range of techniques, solutions and technologies pertaining to how they can manage big data; how to solve issues facing the big data gathering and management in agriculture; new possibilities such as blockchain and modern management techniques of big data analysis; and improving data standards.

This special issue aims to represent an important milestone in highlighting one of the vital themes of digital agriculture and big data management for current and future generations, leading to better agricultural production innovations through big data management.

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Subject Coverage

Suitable topics include, but are not limited, to the following:

- Big data management innovation
- Architecture for big data
- Big data management in agriculture
- Blockchains and big data management
- Blockchains for agriculture innovation
- Innovative business models
- Issues and trends of big data management
- Agriculture productivity and sustainability using big data
- Big data management for agricultural productivity
- Big data for improving business model
- Big data management for sustainable agriculture
- Barriers and opportunities tied to big data adoption
- Propensity to implement big data in agriculture and agri-food supply chains

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Notes for Prospective Authors

Submitted papers should not have been previously published nor be currently under consideration for publication elsewhere. (N.B. Conference papers may only be submitted if the paper has been completely re-written and if appropriate written permissions have been obtained from any copyright holders of the original paper).

All papers are refereed through a peer review process.

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If you have any queries concerning this special issue, please email Dr. Mariantonietta Fiore at mariantonietta.fiore@unifg.it.

Important Dates

Manuscripts due by: *31 May, 2019*

Notification to authors: *31 July, 2019*

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