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Introduction

While the companies collecting big data often do internal quality assessments, repurposing big data for economics research typically requires additional quality checks because the data were not purpose-built to answer the specific research questions in mind. Therefore, quality assurance done by data scientists (e.g., the data quality framework from Agile Lab) needs to be combined with specific checks to ensure big data sources result in high-quality research inputs. In this write-up, the authors propose four general principles for specific quality checks which can be applied to a diverse array of data sources. In the second half of write-up, the authors explain how to put these principles into practice with big data and provide specific examples. (Luiza Andrade, Maria Jone, Sveta Milusheva and Leonardo Viotti, 2021)

The National Scientific & Technical Information Center (NSTIC) produces this bibliography for Quality, Health, Safety and Environment Department (QHSWEB).

This bibliography highlights some of the latest publications, Journal articles for period 2020-2021 using Scopus, Elsevier.

Title: The ontologies community of practice: A CGIAR initiative for big data in agrifood systems.

Authors: Arnaud, E., Laporte, M., Kim, S., Aubert, C., Leonelli, S., Miro, B., . . . King, B.

Journal: Patterns

Doi: <https://doi.org/10.1016/j.patter.2020.100105>

Heterogeneous and multidisciplinary data generated by research on sustainable global agriculture and agrifood systems requires quality data labeling or annotation in order to be interoperable. As recommended by the FAIR principles, data, labels, and metadata must use controlled vocabularies and ontologies that are popular in the knowledge domain and commonly used by the community. Despite the existence of robust ontologies in the Life Sciences, there is currently no comprehensive full set of ontologies recommended for data annotation across agricultural research disciplines. In this paper, we discuss the added value of the Ontologies Community of Practice (CoP) of the CGIAR Platform for Big Data in Agriculture for harnessing relevant expertise in ontology development and identifying innovative solutions that support quality data annotation. The Ontologies CoP stimulates knowledge sharing among stakeholders, such as researchers, data managers, domain experts, experts in ontology design, and platform development teams.

Title: Artificial intelligence techniques for enabling Big Data services in distribution networks: A review

Authors: Barja-Martinez, S., Aragués-Peñalba, M., Munné-Collado, Í, Lloret-Gallego, P., Bullich-Massagué, E., & Villafafila-Robles, R.

Journal: Renewable and Sustainable Energy Reviews

Doi: <https://doi.org/10.1016/j.rser.2021.111459>

Artificial intelligence techniques lead to data-driven energy services in distribution power systems by extracting value from the data generated by the deployed metering and sensing devices. This paper performs a holistic analysis of artificial intelligence applications to distribution networks, ranging from operation, monitoring and maintenance to planning. The potential artificial intelligence techniques for power system applications and needed data sources are identified and classified. The following data-driven services for distribution networks are analyzed: topology estimation, observability, fraud detection, predictive maintenance, non-technical losses detection, forecasting, energy management systems, aggregated flexibility services and trading. A review of the artificial intelligence methods implemented in each of these services is conducted. Their interdependencies are mapped, proving that multiple services can be offered as a single clustered service to different stakeholders. Furthermore, the dependencies between the AI techniques with each energy service are identified. In recent years there has been a significant rise of deep learning applications for time series prediction tasks. Another finding is that unsupervised learning methods are mainly being applied to customer segmentation, buildings efficiency clustering and consumption profile grouping for non-technical losses detection. Reinforcement learning is being widely applied to energy management systems design, although more testing in real environments

is needed. Distribution network sensorization should be enhanced and increased in order to obtain larger amounts of valuable data, enabling better service outcomes. Finally, the future opportunities and challenges for applying artificial intelligence in distribution grids are discussed.

Title: Estimating the CAP greening effect by machine learning techniques: A big data ex post analysis.

Authors: Bertoni, D., Aletti, G., Cavicchioli, D., Micheletti, A., & Pretolani, R.

Journal: Environmental Science & Policy

Doi: <https://doi.org/10.1016/j.envsci.2021.01.008>

Greening payment represents one of the main and controversial novelties of the current Common Agricultural Policy (CAP) 2015–2020 programming period. Such payments bind a portion of farm subsidies to compliance with specified practices, such as crop diversification. Unlike previous ex ante simulations, the present contribution attempts to estimate the ex post impact of greening payments in terms of land use change using a parcel-level constant sample (2011–2017) dataset of approximately 4.5 million observations. First, Markov chains and a weighted χ^2 test detect a discontinuity in farmland transition probabilities only in farms that are initially non-compliant with the greening rules. Such a discontinuity is not observed in farms that are not eligible for or already compliant with the greening rules. This evidence, even if indirect, suggests that the greening payment has induced farmland conversion in farms with a lower degree of crop diversification. The greening impact on farmland allocation in this farm group was subsequently simulated using machine learning techniques. This policy has reduced maize monoculture and increased nitrogen-fixing crops, fallow land and other cereals in the targeted farms. Environmental gains (reduction in greenhouse gas emissions –GHG- and input use) and farm economic losses due to land use change have been derived, providing the first tentative cost-benefit analysis of such policy tool. Due to data limitations, indirect costs and benefits of greening (improvement in pest management, land quality and biodiversity) have not been assessed. More research and detailed environmental monitoring data are required to assess such indirect effects and to provide a more comprehensive cost-benefit ex-post analysis of greening policy

Title: Controlling in-line the energy level applied during the corona treatment

Authors: Amaral-Machado, L., Oliveira, W. N., Rodrigues, V. M., Albuquerque, N. A., Alencar, É N., & Egito, E. S. T.

Journal: Polymer Testing

Doi: <https://doi.org/10.1016/j.polymertesting.2012.02.002>

A method to corona treat a polymeric surface with a fixed and pre-set treatment energy level is proposed. In order to reduce the effect of humidity, the Corona Discharge Energy – CDE value was

controlled during the corona treatment by an in-line monitoring apparatus, which indicates when the energy level is attained. The method was tested applying a negative corona treatment discharge on a polypropylene copolymer film. Chemical and morphological surface changes were examined by IR spectra, contact angle and morphology. Treated samples show the presence of carbonyl, hydroxyl and unsaturations, the first being less concentrated. The formation of polar groups on the film surface led to a reduction of the contact angle and an increase in the surface tension. Film surface morphology was also modified, showing a second phase granular structure which grows with the increase of the CDE level.

Title: Big data and natural environment. How does different data support different green strategies?

Authors: Calza, F., Parmentola, A., & Tutore, I.

Journal: Sustainable Futures

Doi: <https://doi.org/10.1016/j.sftr.2020.100029>

Big data is an increasing trend in strategic management. Notwithstanding, just few studies envisage the potentiality offered by big data to sustain different green strategy typologies. The paper wants to explore how firms can capture value from big data to improve green engagement by providing a conceptual model through a comprehensive and panoramic literature that relates big data sources to the adoption of different green strategies. The main finding of the study is that companies that wants to implement Clean Innovation Strategy often refer to external partner to develop the necessary architecture needed to exploit big data potentialities.

Title: Big data driven management and decision sciences: A NSFC grand research plan

Authors Chen, G., Li, Y., & Wei, Q.

Journal: Fundamental Research

Doi: <https://doi.org/10.1016/j.fmre.2021.08.005>

In the age of big data, the real world can be reflected by or is increasingly composed of data, giving rise to the emerging digital economy where data become strategic assets and basic elements for industrial productions and social activities. In recent years, decision making for organizations as well as for individuals is more and more data-centric and analytics-based, which has attracted great attention of academia and practitioners to big data research and applications including nationwide initiatives in China and the globe. In this context, an important research initiative on big data was launched by the National Natural Science Foundation of China (NSFC) in late 2015 in the form of Grand Research Plan (in brief, the Plan), which is an 8-year joint effort of NSFC's disciplinary departments (i.e., of Management Sciences, Information Sciences, Mathematical & Physical Sciences, and Health Sciences). The main ideas and progress of the Plan are highlighted as follows.

Title: Integrating big data and cloud computing topics into the computing curricula: A modular approach.

Authors: Deb, D., & Fuad, M.

Journal: Journal of Parallel and Distributed Computing

Doi: <https://doi.org/10.1016/j.jpdc.2021.07.012>

Big data and cloud computing collectively offer a paradigm shift in the way businesses are now acquiring, using, and managing information technology. This creates the need for every CS student to be equipped with foundational knowledge in this collective paradigm and possess some hands-on experience in deploying and managing big data applications in the cloud. This study argues that, for substantial coverage of big data and cloud computing concepts and skills, the relevant topics need to be integrated into multiple core courses across the CS curriculum rather than creating additional courses and performing a major overhaul of the curriculum. Our approach to including these topics is to develop autonomous competency-based learning modules for specific core courses in which their coverage might find an appropriate context. In this paper, four such modules are discussed, and our classroom experiences during these interventions are documented. Student performance data and survey results show reasonable success in attaining student learning outcomes, enhanced engagement, and interests.

Title: Retailing and retailing research in the age of big data analytics

Authors: Dekimpe, M. G.

Journal: International Journal of Research in Marketing

Doi: <https://doi.org/10.1016/j.ijresmar.2019.09.001>

As a research domain, the retail sector has always had many appealing features, such as its size, its multi-faceted and dynamic nature, the possibility for researchers to exploit their own domain knowledge, and an extensive coverage by business analysts. In addition, the above-average availability of good-quality data has historically been an additional selling point to empirical researchers. The paper considers to what extent the latter still holds and explores a number of additional opportunities and challenges that emerge from the ongoing big data revolution. This is done from five perspectives: retail managers, retailing researchers, public-policy makers, investors, and retailing educators.

Title: Critical infrastructure literacies and/as ways of relating in big data ecologies.

Authors: Edwards, D. W.

Journal: Computers and Composition

Doi: <https://doi.org/10.1016/j.compcom.2021.102653>

In response to the numerous ethical issues involving big data, this article positions the infrastructural dynamics of big data storage and circulation as a concern for social and environmental justice. After identifying how big data accumulate in place-based ecologies that are made vulnerable to sustain ever-increasing quantities of data, the author explains how most, if not all, digital writing practices are relationally tethered to often distant places. In response, the author argues for developing and sustaining critical infrastructure literacies where big data infrastructures are not perceived as ethereal, cloud-like entities, but as materialities with relations to place, land, water, history, climate, culture, nation, and much else. Attending to infrastructure with a cultural rhetorics orientation attentive to relationality, accountability, and story, the article details four critical practices that place digital citizens within relational matrices where they are asked to account for how data practices affect a constellation of people, places, and environments.

Title: A multi-layer big data value chain approach for security issues.

Authors: Faroukhi, A. Z., El Alaoui, I., Gahi, Y., & Amine, A.

Journal: Procedia Computer Science

Doi: <https://doi.org/10.1016/j.tmaid.2020.101915>

Big Data systems generate a lot of data from different sources, sometimes are less reliable. Also, business ecosystems are highly interconnected, through Big Data Value Chains (BDVC) either internally or with partners, making their data assets and processes more vulnerable to multiple cyber-attacks. However, this kind of sensitive exposition and data workflows requires specific protection and security management. In this contribution, we highlight the importance of coupling BDVC and Big Data security as well as existing contributions addressing these topics. Also, we propose a multi-dimensional model aiming to show cybersecurity milestones and reduce the gap between cyber-risks and how organizations manage their data. For this goal, we suggest a multi-layered security framework to deal with security issues along BDVC. This framework, which is a generic view adaptable to different domains, allows protecting organizations' sensitive data assets as well as privacy concerns. Furthermore, this multi-layer projection ensures a sustainable cyber-ecosystem.

Title: Big data analysis for the estimation of disassembly time and de-manufacturing activity
Authors: Favi, C., Marconi, M., Mandolini, M., & Germani, M.

Journal: Procedia CIRP

Doi: <https://doi.org/10.1016/j.procs.2020.07.109>

Big Data systems generate a lot of data from different sources, sometimes are less reliable. Also, business ecosystems are highly interconnected, through Big Data Value Chains (BDVC) either internally or with partners, making their data assets and processes more vulnerable to multiple cyber-attacks. However, this kind of sensitive exposition and data workflows requires specific protection and security management. In this contribution, we highlight the importance of coupling BDVC and Big Data security as well as existing contributions addressing these topics. Also, we propose a multi-dimensional model aiming to show cybersecurity milestones and reduce the gap between cyber-risks and how organizations manage their data. For this goal, we suggest a multi-layered security framework to deal with security issues along BDVC. This framework, which is a generic view adaptable to different domains, allows protecting organizations' sensitive data assets as well as privacy concerns. Furthermore, this multi-layer projection ensures a sustainable cyber-ecosystem.

Title: Transformations of trust in society: A systematic review of how access to big data in energy systems challenges scandinavian culture.

Authors: Godoy, J. d., Otrell-Cass, K., & Toft, K. H.

Journal: Energy and AI

Doi: <https://doi.org/10.1016/j.egyai.2021.100079>

In the era of information technology and big data, the extraction, commodification, and control of personal information is redefining how people relate and interact. However, the challenges that big data collection and analytics can introduce in trust-based societies, like those of Scandinavia, are not yet understood. For instance, in the energy sector, data generated through smart appliances, like smart metering devices, can have collateral implications for the end-users. In this paper, we present a systematic review of scientific articles indexed in Scopus to identify possible relationships between the practices of collecting, processing, analysing, and using people's data and people's responses to such practices. We contextualise this by looking at research about Scandinavian societies and link this to the academic literature on big data and trust, big data and smart meters, data ethics and the energy sector, surveillance capitalism, and subsequently performing a reflexive thematic analysis. We broadly situate our understanding of culture in this context on the interactions between cognitive norms, material culture, and energy practices. Our analysis identified a number of articles discussing problems and solutions to do with the practices of surveillance capitalism. We also found that research addresses these challenges in different ways. While some research focuses on technological amendments to address users' privacy protection, only few examine the fundamental ethical questions that discuss how big data practices may change societies and increase

their vulnerability. The literature suggests that even in highly trusting societies, like the ones found in Scandinavian countries, trust can be undermined and weakened.

Title: Technological frames in public administration: What do public managers think of big data?

Authors: Guenduez, A. A., Mettler, T., & Schedler, K.

Journal: Government Information Quarterly

Doi: <https://doi.org/10.1016/j.giq.2019.101406>

Being among the largest creators and gatherers of data in many countries, public administrations are looking for ways to harness big data technology. However, the de facto uses of big data in the public sector remain very limited. Despite numerous studies aiming to clarify the term big data, for many public managers, it remains unclear what this technology does and does not offer public administration. Using the concept of technological frames, we explore the assumptions, expectations, and understandings that public managers possess in order to interpret and make sense of big data. We identify nine big data frames, ranging from inward-oriented techno-enthusiasts to outward-oriented techno-skeptics, each of which characterizes public managers' specific viewpoints relating to the introduction of big data in public administrations. Our findings highlight inconsistencies between different perceptions and reveal widespread skepticism among public managers, helping better understand why the de facto uses of big data in the public sector remain very limited.

Title: Big data and predictive analytics in healthcare in bangladesh: Regulatory challenges

Authors: Hassan, S., Dhali, M., Zaman, F., & Tanveer, M.

Journal: Heliyon

Doi: <https://doi.org/10.1016/j.heliyon.2021.e07179>

Big data analytics and artificial intelligence are revolutionizing the global healthcare industry. As the world accumulates unfathomable volumes of data and health technology grows more and more critical to the advancement of medicine, policymakers and regulators are faced with tough challenges around data security and data privacy. This paper reviews existing regulatory frameworks for artificial intelligence-based medical devices and health data privacy in Bangladesh. The study is legal research employing a comparative approach where data is collected from primary and secondary legal materials and filtered based on policies relating to medical data privacy and medical device regulation of Bangladesh. Such policies are then compared with benchmark policies of the European Union and the USA to test the adequacy of the present regulatory framework of Bangladesh and identify the gaps in the current regulation. The study highlights the gaps in policy and regulation in Bangladesh that are hampering the widespread adoption of big data analytics and artificial intelligence in the industry. Despite the vast benefits

that big data would bring to Bangladesh's healthcare industry, it lacks the proper data governance and legal framework necessary to gain consumer trust and move forward. Policymakers and regulators must work collaboratively with clinicians, patients and industry to adopt a new regulatory framework that harnesses the potential of big data but ensures adequate privacy and security of personal data. The article opens valuable insight to regulators, academicians, researchers and legal practitioners regarding the present regulatory loopholes in Bangladesh involving exploiting the promise of big data in the medical field. The study concludes with the recommendation for future research into the area of privacy as it relates to artificial intelligence-based medical devices should consult the patients' perspective by employing quantitative analysis research methodology.

Title: Internet-of-things enabled supply chain planning and coordination with big data services: Certain theoretic implications.

Authors: He, L., Xue, M., & Gu, B.

Journal: Journal of Management Science and Engineering

Doi: <https://doi.org/10.1016/j.jmse.2020.03.002>

Recent advances in information technology have led to profound changes in global manufacturing. This study focuses on the theoretical and practical challenges and opportunities arising from the Internet of Things (IoT) as it enables new ways of supply-chain operations partially based on big-data analytics and changes in the nature of industries. We intend to reveal the acting principle of the IoT and its implications for big-data analytics on the supply chain operational performance, particularly with regard to dynamics of operational coordination and optimization for supply chains by leveraging big data obtained from smart connected products (SCPs), and the governance mechanism of big-data sharing. Building on literature closely related to our focal topic, we analyze and deduce the substantial influence of disruptive technologies and emerging business models including the IoT, big data analytics and SCPs on many aspects of supply chains, such as consumers value judgment, products development, resources allocation, operations optimization, revenue management and network governance. Furthermore, we propose several research directions and corresponding research schemes in the new situations. This study aims to promote future researches in the field of big data-driven supply chain management with the IoT, help firms improve data-driven operational decisions, and provide government a reference to advance and regulate the development of the IoT and big data industry.

Title: Customer experience management in the age of big data analytics: A strategic framework.

Authors: Holmlund, M., Van Vaerenbergh, Y., Ciuchita, R., Ravald, A., Sarantopoulos, P., Ordenes, F. V., & Zaki, M.

Journal: Journal of Business Research

Doi: <https://doi.org/10.1016/j.jbusres.2020.01.022>

Customer experience (CX) has emerged as a sustainable source of competitive differentiation. Recent developments in big data analytics (BDA) have exposed possibilities to unlock customer insights for customer experience management (CXM). Research at the intersection of these two fields is scarce and there is a need for conceptual work that (1) provides an overview of opportunities to use BDA for CXM and (2) guides management practice and future research. The purpose of this paper is therefore to develop a strategic framework for CXM based on CX insights resulting from BDA. Our conceptualisation is comprehensive and is particularly relevant for researchers and practitioners who are less familiar with the potential of BDA for CXM. For managers, we provide a step-by-step guide on how to kick-start or implement our strategic framework. For researchers, we propose some opportunities for future studies in this promising research area.

Title: Biochemical role of serum ferritin and d-dimer parameters in COVID 19 diagnosis

Authors: Iliashenko, O., Iliashenko, V., & Lukyanchenko, E.

Journal: . Transportation Research Procedia

Doi: <https://doi.org/10.1016/j.trpro.2021.02.145>

This article is built on the exploration of the possibilities of using Big Data, Machine Learning and the Internet of Things technologies for the needs of transport planning and modeling. The authors analyze the problems arising in the transport infrastructure because of the growing urbanization of cities and propose a solution to the problems based on the use of processing large amounts of data. As a result of the study, a comparative table was created showing the possible application of Big Data technologies in integration with other modern technologies and what problems of transport planning they will solve.

Title: A note on big data analytics capability development in supply chain.

Authors: Jha, A. K., Agi, M. A. N., & Ngai, E. W. T.

Journal: Decision Support Systems

Doi: <https://doi.org/10.1016/j.dss.2020.113382>

Big data analytics (BDA) are gaining importance in all aspects of business management. This is driven by both the presence of large-scale data and management's desire to root decisions in data. Extant research demonstrates that supply chain and operations management functions are among the biggest sources and users of data in the company. Therefore, their decision-making processes would benefit from increased use of BDA technologies. However, there is still a lack of understanding of what determines a company's ability to build BDA capability to gain a competitive advantage. In this study, we attempt to answer this fundamental question by identifying the factors that assist a company in or inhibit it from building its BDA capability and maximizing its gains through BDA technologies. We base our findings on a qualitative analysis of data collected from field visits, interviews with senior management, and secondary resources. We find that, in addition to technical capacity, competitive landscape and intra-firm power dynamics play an important role in building BDA capability and using BDA technologies.

Title: A large multi-group decision-making technique for prioritizing the big data-driven circular economy practices in the automobile component manufacturing industry.

Authors: Kamble, S. S., Belhadi, A., Gunasekaran, A., Ganapathy, L., & Verma, S.

Journal: Technological Forecasting and Social Change

Doi: <https://doi.org/10.1016/j.techfore.2020.120567>

The present study uses a large group decision-making technique to identify and rank the best big data-driven circular economy (BDDCE) practices in the auto-component industry. The data pertaining to the BDDCE practices were collected from the decision-makers in three groups, namely, purchasing, manufacturing, and logistics & marketing function from the auto-component manufacturing industry. First, the consensus on the BDDCE practices within the group was ascertained followed by determining the decision weights using the percentage distributions and subjective weights. This was followed by the by computing the dominance degrees on pairwise comparisons of the BDDCE practices and ranking them using the PROMETHEE II method. The findings indicated that the BDDCE practices that were more inclined towards the enhancement of internal supply chain integration were most preferred and highly ranked by the decisionmakers in the auto-component industry as compared to the practices that were focused on improving the supplier and customer interfaces such as green purchasing, sale of excess inventory, and developing recycling systems for end-of-life products and materials. The high ranked BDDCE practices included minimization of the raw material consumption, plan for reuse, recycle, recovery of material, parts, and reduction of the process waste at the design stage.

Title: Smart cities, big data and urban policy: Towards urban analytics for the long run.

Authors: Kandt, J., & Batty, M.

Journal: Cities

Doi: <https://doi.org/10.1016/j.cities.2020.102992>

The analysis of big data is deemed to define a new era in urban research, planning and policy. Real-time data mining and pattern detection in high-frequency data can now be carried out at a large scale. Novel analytical practices promise smoother decision-making as part of a more evidence-based and smarter urbanism, while critical voices highlight the dangers and pitfalls of instrumental, data-driven city making to urban governance. Less attention has been devoted to identifying the practical conditions under which big data can realistically contribute to addressing urban policy problems. In this paper, we discuss the value and limitations of big data for long-term urban policy and planning. We first develop a theoretical perspective on urban analytics as a practice that is part of a new smart urbanism. We identify the particular tension of opposed temporalities of high-frequency data and the long durée of structural challenges facing cities. Drawing on empirical studies using big urban data, we highlight epistemological and practical challenges that arise from the analysis of high-frequency data for strategic purposes and formulate propositions on the ways in which urban analytics can inform long-term urban policy.

Title: Paradigm change in indian agricultural practices using big data: Challenges and opportunities from field to plate

Authors: Kellengere Shankarnarayan, V., & Ramakrishna, H.

Journal: Information Processing in Agriculture

Doi: <https://doi.org/10.1016/j.inpa.2020.01.001>

Agriculture is the backbone of the Indian Economy. However, statistics show that the rural population and arable land per person is declining. This is an ominous development for a country with a population of more than one billion, with over sixty-six percent living in rural areas. This paper aims to review current studies and research in agriculture, employing the recent practice of Big Data analysis, to address various problems in this sector. To execute this review, this article outline a framework for Big Data analytics in agriculture and present ways in which they can be applied to solve problems in the present agricultural domain. Another goal of this review is to gain insight into state-of-the-art Big Data applications in agriculture and to use a structural approach to identify challenges to be addressed in this area. This review of Big Data applications in the agricultural sector has also revealed several collection and analytics tools that may have implications for the power relationships between farmers and large corporations.

Title: A big data state of mind: Epistemological challenges to accountability and transparency in data-driven regulation.

Authors: Kempeneer, S.

Journal: Government Information Quarterly

Doi: <https://doi.org/10.1016/j.giq.2021.101578>

In a sense, the 2008 financial crisis was a crisis of theory. Regulators, banks, and financial markets all had encompassing theoretical models about how the economy worked, but they all failed to predict the looming crisis. As such, regulators increasingly turn to big data to understand banks' health. Despite the prominence of big data in society, its use in the public sector remains grossly understudied. This paper explores the regulatory use of big data in the case of the EU-wide banking stress test, a key regulatory indicator. The paper draws on interviews with supervisors at the European Central Bank (ECB), European Banking Authority (EBA) and National Bank of Belgium (NBB), as well as with consultants and risk directors in Belgian banks, to explain how big data-driven regulation affects the relationship between regulators and regulated entities. It draws particular attention to the epistemological component of using large data sets in decision-making: a big data state of mind. The article more specifically shows how the underlying epistemology, rather than simply the bigness of datasets, affects the relationship between regulators and regulated entities, and the regulatory process at large. The paper concludes that regulators' big data state of mind calls for new practical and legal guidelines regarding the validity of data-driven knowledge claims. Moreover, it shows how accountability based on descriptive transparency no longer makes sense in the 'age of the algorithm', suggesting a shift towards relational transparency and joint knowledge production.

Title: A systematic literature review of supply chain decision making supported by the internet of things and big data analytics.

Authors: Koot, M., Mes, M. R. K., & Iacob, M. E.

Journal: Computers & Industrial Engineering

Doi: <https://doi.org/10.1016/j.cie.2020.107076>

The willingness to invest in Internet of Things (IoT) and Big Data Analytics (BDA) seems not to depend on supply nor demand of technological innovations. The required sensing and communication technologies have already matured and became affordable for most organizations. Businesses on the other hand require more operational data to address the dynamic and stochastic nature of supply chains. So why should we wait for the actual implementation of tracking and monitoring devices within the supply chain itself? This paper provides an objective overview of state-of-the-art IoT developments in today's supply chain and logistics research. The main aim is to find examples of academic literature that explain how organizations can incorporate real-time data of physically operating objects into their decision making. A systematic literature review is conducted to gain insight into the IoT's analytical capabilities, resulting into a list of 79 cross-disciplinary publications. Most researchers integrate the newly developed measuring devices with more traditional ICT infrastructures to either visualize the current way of operating, or to better predict the system's future state. The resulting health/condition monitoring systems seem to benefit production environments in terms of dependability and quality, while logistics operations are becoming more flexible and faster due to the stronger emphasis on prescriptive analytics (e.g., association and clustering). Further research should extend the IoT's perception layer with more

context-aware devices to promote autonomous decision making, invest in wireless communication networks to stimulate distributed data processing, bridge the gap in between predictive and prescriptive analytics by enriching the spectrum of pattern recognition models used, and validate the benefits of the monitoring systems developed.

Title: The smart circular economy: A digital-enabled circular strategies framework for manufacturing companies.

Authors: Kristoffersen, E., Blomsma, F., Mikalef, P., & Li, J.

Journal: Journal of Business Research

Doi: <https://doi.org/10.1016/j.jbusres.2020.07.044>

Digital technologies (DTs), such as the Internet of Things (IoT), big data, and data analytics, are considered essential enablers of the circular economy (CE). However, as both CE and DTs are emerging fields, there exists little systematic guidance on how DTs can be applied to capture the full potential of circular strategies for improving resource efficiency and productivity. Furthermore, there is little insight into the supporting business analytics (BA) capabilities required to accomplish this. To address this gap, this paper conducts a theory- and practice-based review, resulting in the Smart CE framework that supports translating the circular strategies central to the goals of manufacturing companies in contributing the United Nation's (UN) 12th Sustainable Development Goal, that is, "sustainable consumption and production," into the BA requirements of DTs. Both scholars and practitioners may find the framework useful to (1) create a common language for aligning activities across the boundaries of disciplines such as information systems and the CE body of knowledge, and (2) identify the gap between the current and entailed BA requirements and identify the strategic initiatives needed to close it. Additionally, the framework is used to organize a database of case examples to identify some best practices related to specific smart circular strategies.

Title: A review of industrial big data for decision making in intelligent manufacturing.

Authors: Li, C., Chen, Y., & Shang, Y.

Journal: Engineering Science and Technology, an International Journal

Doi: <https://doi.org/10.1016/j.jestch.2021.06.001>

Under the trend of economic globalization, intelligent manufacturing has attracted a lot of attention from academic and industry. Related enabling technologies make manufacturing industry more intelligent. As one of the key technologies in artificial intelligence, big data driven analysis improves the market competitiveness of manufacturing industry by mining the hidden knowledge value and potential ability of industrial big data, and helps enterprise leaders make wise decisions in various complex manufacturing environments. This paper provides a theoretical analysis basis for big data-driven technology to guide decision-making in intelligent manufacturing, fully demonstrating the practicability of big data-driven technology in the intelligent manufacturing

industry, including key advantages and internal motivation. A conceptual framework of intelligent decision-making based on industrial big data-driven technology is proposed in this study, which provides valuable insights and thoughts for the severe challenges and future research directions in this field.

Title: Research on the big data of traditional taxi and online car-hailing: A systematic review.

Authors: Lyu, T., Wang, P., Gao, Y., & Wang, Y.

Journal: . Journal of Traffic and Transportation Engineering (English Edition),

Doi: <https://doi.org/10.1016/j.jtte.2021.01.001>

The purpose of this paper is to provide a summary of a quick overview of the latest developments and unprecedented opportunities for scholars who want to set foot in the field of traditional taxi and online car-hailing (TTOC). From the perspectives of peoples (e.g., passenger, driver, and policymaker), vehicle, road, and environment, this paper describes the current research status of TTOC's big data in six hot topics, including the ridership factor, spatio-temporal distribution and travel behavior, cruising strategy and passenger service market partition, route planning, transportation emission and new-energy, and TTOC's data extensional application. These topics were included in five mainstreams as follows: (1) abundant studies often focus only on determinant analysis on given transportation (taxi, transit, online car-hailing); the exploration of ridership patterns for a multi-modal transportation mode is rare; furthermore, multiple aspects of factors were not considered synchronously in a wide time span; (2) travel behavior research mainly concentrates on the commuting trips and distribution patterns of various travel indices (e.g., distance, displacement, time); (3) the taxi driver-searching strategy can be divided into autopsychic cruising and system dispatching; (4) the spatio-temporal distribution character of TTOC's fuel consumption (FC) and greenhouse gas (GHG) emissions has become a hotspot recently, and there has been a recommendation for electric taxi (ET) in urban cities to decrease transportation congestion is proposed; and (5) based on TTOC and point of interest (POI) multi-source data, many machine learning algorithms were used to predict travel condition indices, land use, and travel behavior. Then, the main bottlenecks and research directions that can be explored in the future are discussed. We hope this result can provide an overview of current fundamental aspects of TTOC's utilization in the urban area.

Title: Is repairability enough? big data insights into smartphone obsolescence and consumer interest in repair

Authors: Makov, T., & Fitzpatrick, C.

Journal: Journal of Cleaner Production

Doi: <https://doi.org/10.1016/j.jclepro.2021.127561>

A dominant narrative surrounding smartphone lifespans suggests that their objective functional capabilities deteriorate rapidly and that if only devices were more repairable consumers would use

them longer thereby reducing demand for new production and e-waste generation. Here we use a big-data approach to help unpack this narrative and examine two related yet distinct aspects: smartphone performance and obsolescence, and consumers interest in repair. Examining over 3.5 million iPhone benchmarking test scores, we reveal that the objective performance of devices remains very stable over time and does not rapidly deteriorate as common wisdom might suggest. In contrast, testing frequency varies substantially. This discrepancy suggests that factors other than objective performance meaningfully influence consumers' perceptions of smartphone functionality and obsolescence. Relatedly, our analysis of 22 million visits to a website offering free repair manuals reveals that interest in repair declines exponentially over time and that repairability does not necessarily prolong consumer's interest in repair. Taken together, our findings indicate that non-technical aspects, such as mental depreciation and perceived obsolescence play a critical role in determining smartphone lifespans and suggest that focus on the technical aspects of repairability as currently discussed by policy makers is unlikely to yield the desired extension in smartphone lifespan. We propose that sustainability advocates try to avoid narratives of planned obsolescence which might have counterproductive impacts on perceived obsolescence and consumer's' interest in repair, and instead highlight how well devices perform over time. More broadly, this work demonstrates the potential of using novel datasets to directly observe consumer behavior in natural settings and improve our general understanding of issues such as planned obsolescence and repair.

Title: The role of information governance in big data analytics driven innovation.

Authors: Mikalef, P., Boura, M., Lekakos, G., & Krogstie, J.

Journal: . Information & Management,

Doi: <https://doi.org/10.1016/j.im.2020.103361>

The age of big data analytics is now here, with companies increasingly investing in big data initiatives to foster innovation and outperform competition. Nevertheless, while researchers and practitioners started to examine the shifts that these technologies entail and their overall business value, it is still unclear whether and under what conditions they drive innovation. To address this gap, this study draws on the resource-based view (RBV) of the firm and information governance theory to explore the interplay between a firm's big data analytics capabilities (BDACs) and their information governance practices in shaping innovation capabilities. We argue that a firm's BDAC helps enhance two distinct types of innovative capabilities, incremental and radical capabilities, and that information governance positively moderates this relationship. To examine our research model, we analyzed survey data collected from 175 IT and business managers. Results from partial least squares structural equation modelling analysis reveal that BDACs have a positive and significant effect on both incremental and radical innovative capabilities. Our analysis also highlights the important role of information governance, as it positively moderates the relationship between BDAC's and a firm's radical innovative capability, while there is a nonsignificant moderating effect for incremental innovation capabilities. Finally, we examine the effect of environmental uncertainty

conditions in our model and find that information governance and BDACs have amplified effects under conditions of high environmental dynamism.

Title: The role of information governance in big data analytics driven innovation.

Authors: Mikalef, P., Krogstie, J., Pappas, I. O., & Pavlou, P.

Journal: Information & Management,

Doi: <https://doi.org/10.1016/j.im.2019.05.004>

A central question for information systems (IS) researchers and practitioners is if, and how, big data can help attain a competitive advantage. To address this question, this study draws on the resource-based view, dynamic capabilities view, and on recent literature on big data analytics, and examines the indirect relationship between a firm's big data analytics capability (BDAC) and competitive performance. The study extends existing research by proposing that BDACs enable firms to generate insight that can help strengthen their dynamic capabilities, which, in turn, positively impact marketing and technological capabilities. To test our proposed research model, we used survey data from 202 chief information officers and IT managers working in Norwegian firms. By means of partial least squares structural equation modeling, results show that a strong BDAC can help firms build a competitive advantage. This effect is not direct but fully mediated by dynamic capabilities, which exerts a positive and significant effect on two types of operational capabilities: marketing and technological capabilities. The findings suggest that IS researchers should look beyond direct effects of big data investments and shift their attention on how a BDAC can be leveraged to enable and support organizational capabilities.

Title: The role of sensors, big data and machine learning in modern animal farming.

Authors: Neethirajan, S.

Journal: Sensing and Bio-Sensing Research,

Doi: <https://doi.org/10.1016/j.sbsr.2020.100367>

Ever since man began domesticating animals several thousand years ago, we have always relied on our intuition, collective knowledge, and sensory signals to make effective animal production decisions. So far, this has helped us make significant gains in animal husbandry and farming. Together the growing demand for food and the advancement in sensing technology have the potential to make animal farming more centralized, large scale and efficient. It has the potential to change animal farming as we know it. At a broader level, this paper explores the challenges and opportunities that sensor technologies present in terms of helping animal farmers produce more meat and animal products. More specifically, this paper explores the role of sensors, big data, artificial intelligence and machine learning in helping animal farmers to lower production costs, increase efficiencies, enhance animal welfare and grow more animals per hectare. It also explores

the challenges and limitations of technology. The paper reviews various animal farming technology applications to understand its value in helping farmers improve animal health, increase profits and lower environmental footprint.

Title: News and narratives in financial systems: Exploiting big data for systemic risk assessment

Authors: Nyman, R., Kapadia, S., & Tuckett, D

Journal: Journal of Economic Dynamics and Control

Doi: <https://doi.org/10.1016/j.jedc.2021.104119>

This paper applies algorithmic analysis to financial market text-based data to assess how narratives and sentiment might drive financial system developments. We find changes in emotional content in narratives are highly correlated across data sources and show the formation (and subsequent collapse) of exuberance prior to the global financial crisis. Our metrics also have predictive power for other commonly used indicators of sentiment and appear to influence economic variables. A novel machine learning application also points towards increasing consensus around the strongly positive narrative prior to the crisis. Together, our metrics might help to warn about impending financial system distress.

Title: Big data, analytics and artificial intelligence for sustainability

Authors: Ojokoh, B. A., Samuel, O. W., Omisore, O. M., Sarumi, O. A., Idowu, P. A., Chimusa, E. R. Katsriku, F. A.

Journal: Scientific African

Doi: <https://doi.org/10.1016/j.sciaf.2020.e00551>

Big data technologies, Analytics and Artificial Intelligence are great tools with capabilities to accomplish complex tasks at levels beyond human skills. The trio are becoming more and more prominent these days as they can be utilized to collect, organize, and analyze large varied data sets in order to reveal hidden patterns and trends that can help address several problems peculiar to sustainable development. Nevertheless, a number of challenges arise in the process of exploring these technologies for proffering solutions. This special issue presents novel research approaches adopted in Africa in relation to Big Data, Analytics and Artificial Intelligence in different domains. It also presents the challenges and issues that can be explored in the future.

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