processes

MDPI

Editorial

Applied Research Towards Industry 4.0: Opportunities for SMEs

Ilaria Zambon [1,*], Gianluca Egidi [1], Fabiano Rinaldi [2] and Sirio Cividino [3]

[1] Department of Agricultural and Forestry Sciences (DAFNE), Tuscia University, Via San Camillo de Lellis, 01100 Viterbo, Italy; egidi.gianluca@yahoo.it
[2] Centro Ricerche e Studi dei Laghi, Corso di Porta Vittoria 31, 20122 Milano, Italy; fabiano.rinaldi@silaq.it
[3] Department of Agricultural, Food, Environmental and Animal Sciences, University of Udine, via delle Scienze 206, 33100 Udine, Italy; agricolturasicura@gmail.com
* Correspondence: ilaria.zambon@unitus.it; Tel.: +39-07-6135-7356

Received: 27 May 2019; Accepted: 3 June 2019; Published: 5 June 2019

check for updates

Abstract: Industry 4.0 designates the recent digital revolution in the industrial sector, evolving from the comprehensive networking and automation of all the productive areas. Equipment, machinery, materials and products permit to (i) distinguish dealing out environmental settings and current status via sensors; (ii) join them through fixed software; and (iii) progress production procedures in an exclusive method. Additionally, Industry 4.0 exposes new trials to enterprises, especially small and medium-sized enterprises (SMEs). Firms should advance approaches to (i) achieve chances of innovation and digitalization; (ii) expand their processes; and (iii) define innovative business models. Based on these premises, a well-organized political, legal and infrastructural outline is essential to build up a business having an Industry 4.0 approach. Though bigger firms can get ahead through innovation processes and predicting the potential digitalization risks for their business models, SMEs may be in trouble. The present editorial aims to offer relevant research outcomes that has been carried out on such a current and emblematic theme, offering new perspectives and opportunities especially for SMEs.

Keywords: Industry 4.0; SMEs; technologies; industrial processes; job safety; renewable energy; sustainable development

1. Introduction

Industry 4.0 exposes new trials to enterprises, especially small and medium-sized enterprises (SMEs). Firms should advance approaches to (i) achieve chances of innovation and digitalization; (ii) enlarge their processes; and (iii) define innovative business models [1–3]. The present editorial summarizes all the findings and research activities collected in the Special Issue "Process Industry 4.0: Application Research to Small and Medium-Sized Enterprises (SMEs)". Many targets were addressed: (i) Describing a growth system founded on sustainable development; (ii) spreading on 4.0 approaches in all productive sectors, e.g., industry and agriculture; and (iii) constantly ensuring a high-degree of safety for work [4–19], encouraging energy efficiency and production development processes [12,19–24] and identifying suitable 4.0 practices and approaches.

2. Industrial Applications

An operative dynamic control approach of a key supplier with many downstream manufacturers [25] focused on intelligent data using analytics-based cloud computing. Numerous doubts are embedded in the supply chain system. Although managing a supply plan is difficult bearing in mind such drivers in traditional outlines, the planned outline perceives the evolving changes using a specific cloud system. A real-time control, useful for detecting indeterminate scenarios, can be achieved by means of industrial Internet of Things and cloud systems. Exposing the efficiency of the proposed outline, real manufacturing cases and their numerical studies were offered. The current competitive environment stresses more efficient firms. Agent-based simulation of value flow was studied in an industrial process for an SME [26]. A manufacturing system was analyzed for increasing its production capacity with the intention of replying to the customer's increased demand.

The project and application of an optimal travel route recommender organization was explored by examining the data history of earlier users [27]. Information were collected from the travel data derived from mobile tourists during a year. An inherent algorithm was planned to find the ideal route of typical mobile tourists in Jeju, verifying the effectiveness of the planned system.

Furthermore, strategies of sustainable development and energy effectiveness must be followed [22,28–37]. Inside the sector of Industry 4.0, "Smart Energy" can be defined as a level of new energy supply systems [17,20–24], focused on monitoring energy consumption. Following the Industry 4.0 model, agriculture must also adopt appropriate technologies (e.g., precision farming). Increasing energy requests and environmental concerns are the new challenges, which agriculture can meet (in part) by using biomass residues derived from the agro-forestry sector [17,20,21,38].

Underground risk index valuation and prediction were explored by means of a basic Hierarchical Fuzzy Logic Model and Kalman Filter [28]. Usually, many of the accidents that occur in underground facilities are not instant. A well-organized implication system is extremely required to inform of these incidents as soon as possible. Results indicated that the suggested technique is suitable for a correct risk index valuation and forecast. Moreover, a safer future was explored using recent job accidents (from 2012 to 2017) in the primary sector in Italy [39]. Training or educational programs should be strategic for increasing the consciousness on risks, e.g., workers in agriculture [40–42]. Future situations can be discovered following explicit information and dealing with risk factors at different job sites with the concluding aim to found appropriate technical, judicial and working actions to decrease job accidents. Also, workers at the shipyards are strongly subject to unsafe working environments [43]. Seeing the difficulty of the shipbuilding procedure, efficient communications among workers are indispensable, but present communication devices, e.g., wireless technologies, are sometimes inadequate due to shadow areas where the radio bands cannot reach. The proposed solution suggests a mobile communication service throughout shipbuilding inside the ship, permitting both rapid work reports and instructions and fast replies to tragedy occurrence, guaranteeing workers' safety.

3. The Role of Industry 4.0

Regulating innovation management in the aerospace industry signifies a chance for SMEs [44]. Producers can select among many suppliers, which must observe with more necessities and technical conditions. Business chances for SMEs are restricted, but still suppliers must attempt to influence the strategic benefit. Assuming different research, development and innovation platforms, which can established greater profits to firms, would permit for important compensations. Analyzing a Spanish innovative small company, a management system allowed the Spanish firm, e.g., to modernize its innovation activities. Adoption steps taken by the Spanish SME can be adopted by other SMEs.

Resource and information access for SME sustainability during the industrial revolution 4.0 discovered the facilitating and controlling roles of innovation competence and management commitment [45]. The present paper focused on 222 SMEs in Pakistan which applied a sampling technique to allocate the survey questionnaire. Smart-PLS software was used to examine the data, indicating which information can affect both sustainability and innovation competence.

Another study examined the influences that are affecting the use of Industry 4.0 technologies in Peruvian micro, small, and medium enterprises [46], revealing some endorsements that might be helpful for these firms. In fact, there are several barriers and drivers in using Industry 4.0., e.g., lack of information and decision-making [47]. Another paper focused on Romanian SMEs concerning the application of these technology, identifying the thoughts and insights of SME managers in Romania on

Industry 4.0 technology for their business development. Romania is changing from Industry 2.0 to Industry 4.0, exposing a high degree of knowledge on advanced technology, but also few necessary resources for implementing a model based on Industry 4.0. Among the tools useful for implementing an Industry 4.0, an enhanced temperature control performance of a thermoelectric dehumidifier was explored [48]. Reducing the energy consumption by refining the performance of the dehumidifier, it can be applied to numerous control fields. Complications of SMEs in Industry 4.0 applications can be examined by an investigative hierarchy process and a network process [49]. Using new production and management technologies, essential for Industry 4.0, is significant for small enterprises with the intention of keeping up with the competition. Though, most firms look at these necessities in a negative way. Moreover, the role of business model innovation derived from Industry 4.0 was investigated. A business model innovation of providers towards customer process innovation was offered [50]. Findings carried out from 111 German Industry 4.0 providers exposed correlations among Industry 4.0 solutions and benefits for both (i) the solution providers and (ii) process improvements of the customers, revealing both decision-making and research suggestions.

A time-based trend of carbon emissions in the composting process of swine manure was proposed in the background of Agriculture 4.0 [51]. Concentrations of CO_2 and CH_4 were correspondingly examined through the pig-manure composting process to comprehend their effects and to protect a supply chain. Simulation and modeling are the two most operative tools for designing or analyzing a process [52]. In many cases, they are the only conceivable means of making a safe engineering choice for a new notion of process for a large-scale system. Simulations and a test-bed experiment were performed for measuring a low-power digital excitation system. The paper confirmed the system's efficiency. An excitation system is also anticipated to rise the constancy and economic consequence by enhancing existing systems [53], focusing on selected students and establishing an education system prone to a digital excitation system. An adaptive approach built on resource awareness to power-efficient, real-time periodic task modeling on fixed Internet of Things devices was offered [54]. However, the latter devices have restricted competences regarding memory and power. A resource-aware approach was suggested to diminish the hyper-period of input tasks founded on device profiles and to permit tasks of all possible period value, indicating significant developments concerning power consumption. Effects of cooperation on manufacturing were also explored, focusing on safety management [55]. Manufacturing IT needs immediate progress and a new distribution form. The paper investigates the waterfall method which is being used in general manufacturing System Integration projects and the proposed DevOps method, which demands earlier distribution and improvement.

4. Review on Industry 4.0

The Revolution 4.0 interested both industry and agriculture for SMEs [56]. Specific challenges face agriculture along the farming supply chain to permit the working application of Industry 4.0 guidelines. Industry is developing at a much faster rate than agriculture (e.g., Industry 5.0). While, Agriculture 4.0 is still restricted to a few advanced firms. Regardless of the recompences of industry or agriculture 4.0 for large firms, SMEs often face difficulties in such advanced developments owing to the incessant progress in innovations and technologies. Additionally, multiscale and multi-granularity process analytics were revised [57] since they are important for the future of process analytics regarding numerous common activities. The presence of pertinent dynamics at multiple scales turned out to be a shared pattern. Consequently, multiscale methods must be applied with the intention of avoiding biased examination towards a certain scale, conceding the benefits from the stable exploitation of the information content at all scales.

5. Focusing on Costs

Estimating complications in the Internet of Things was offered with multi-criteria decision-making [58]. As an outcome, the degree of importance of the factors instigating such complications was due to multi-criteria decision-making approaches. The chief purpose of the firms transitioning to Industry 4.0 is the communication of things with each other. This means that enterprises will be able to accelerate the change towards the Internet of Things by minimalizing time and economic loss. An optimal operating schedule for an energy storage system was proposed focusing on efficient energy management for microgrids [59]. A post-Industry-4.0 consumer needs an ideal project and control of energy storage founded on a request prediction, by means of big data, to sturdily supply energy. Finally, a cost-effective redundant digital excitation control system and test bed experiment for safe power supply for Industry 4.0 was offered [60]. Though, such a system is too costly for smaller power plants. The system has enhanced its constancy and dependability at the similar time through double (redundant) configuration. Besides, the system's performance was tested by screening a sequence of control function tests after putting it into the gas turbine used in a thermal power station. Innovative relays were connected after eliminating the power supply in the current panel.

6. Conclusions

A complex but efficient framework was offered by this Special Issue, which is essential to allow industries to face Industry 4.0. Though large firms can forestall the risks of digitalization for their business models, SMEs may be in difficulty for several reason. Consequently, the determination is to advance the 4.0 framework settings, supporting structures to facilitate SMEs to meet future challenges and benefiting from the chances of the fourth industrial revolution.

Author Contributions: I.Z., G.E., F.R. and S.C. analyzed the data and wrote the paper.

Funding: This research received no external funding.

Conflicts of Interest: The authors declare no conflict of interest.

References

1. Barontini, M.; Silvestri, I.P.; Nardi, V.; Bovicelli, P.; Pari, L.; Gallucci, F.; Righi, G. Easy eco-friendly phenonium ion production from phenethyl alcohols in dimethyl carbonate. *Tetrahedron Lett.* **2013**, *54*, 5004–5006. [CrossRef]
2. Ruggieri, A.; Mosconi, E.M.; Poponi, S.; Silvestri, C. Digital innovation in the job market: An explorative study on cloud working platforms. In *Empowering Organizations*; Springer: Cham, Switzerland, 2016; pp. 273–283.
3. Mosconi, E.M.; Silvestri, C.; Poponi, S.; Braccini, A.M. Public policy innovation in distance and on-line learning: Reflections on the Italian case. In *Organizational Change and Information Systems*; Springer: Berlin/Heidelberg, Germany, 2013; pp. 381–389.
4. Gambella, F.; Paschino, F.; Dimauro, C. Evaluation of fruit damage caused by mechanical harvesting of table olives. *Trans. ASABE* **2013**, *56*, 1267–1272.
5. Gambella, F.; Paschino, F.; Bertetto, A.M.; Curà, F.; Gallo, F.; Rosso, C.; Manca, N. Perspectives in the mechanization of saffron crocus sativus l. *Int. J. Mech. Control* **2013**, *14*, 3–8.
6. Gambella, F.; Piga, A.; Agabbio, M.; Vacca, V.; D'hallewin, G. Effect of different pre-treatments on drying of green table olives (*Ascolana tenera var.*). *Grasas Aceites* **2000**, *51*, 173–176.
7. Paolini, V.; Petracchini, F.; Carnevale, M.; Gallucci, F.; Perilli, M.; Esposito, G.; Frattoni, M. Characterisation and cleaning of biogas from sewage sludge for biomethane production. *J. Environ. Manag.* **2018**, *217*, 288–296. [CrossRef] [PubMed]
8. Sartori, L.; Gambella, F. Comparison of mechanical and manual cane pruning operations on three varieties of grape (Cabernet Sauvignon, Merlot, and Prosecco) in Italy. *Trans. ASABE* **2014**, *57*, 701–707.
9. Cecchini, M.; Colantoni, A.; Massantini, R.; Monarca, D. Estimation of the risks of thermal stress due to the microclimate for manual fruit and vegetable harvesters in central Italy. *J. Agric. Saf. Health* **2010**, *16*, 141–159. [CrossRef]
10. Cecchini, M.; Cossio, F.; Marucci, A.; Monarca, D.; Colantoni, A.; Petrelli, M.; Allegrini, E. Survey on the status of enforcement of European directives on health and safety at work in some Italian farms. *J. Food Agric. Environ.* **2013**, *11*, 595–600.

11. Boubaker, K.; Colantoni, A.; Allegrini, E.; Longo, L.; Di Giacinto, S.; Monarca, D.; Cecchini, M. A model for musculoskeletal disorder-related fatigue in upper limb manipulation during industrial vegetables sorting. *Int. J. Ind. Ergon.* **2014**, *44*, 601–605. [CrossRef]
12. Boubaker, K.; Colantoni, A.; Marucci, A.; Longo, L.; Gambella, F.; Cividino, S.; Cecchini, M. Perspective and potential of CO_2: A focus on potentials for renewable energy conversion in the Mediterranean basin. *Renew. Energy* **2016**, *90*, 248–256. [CrossRef]
13. Colantoni, A.; Longo, L.; Gallucci, F.; Monarca, D. Pyro-gasification of hazelnut pruning using a downdraft gasifier for concurrent production of syngas and biochar. *Contemp. Eng. Sci.* **2016**, *9*, 1339–1348. [CrossRef]
14. Colantoni, A.; Monarca, D.; Laurendi, V.; Villarini, M.; Gambella, F.; Cecchini, M. Smart machines, remote sensing, precision farming, processes, mechatronic, materials and policies for safety and health aspects. *Agriculture* **2018**, *8*, 47. [CrossRef]
15. Deboli, R.; Calvo, A.; Gambella, F.; Preti, C.; Dau, R.; Casu, E.C. Hand arm vibration generated by a rotary pick-up for table olives harvesting. *Agric. Eng. Int.: CIGR J.* **2014**, *16*, 228–235.
16. Di Giacinto, S.; Colantoni, A.; Cecchini, M.; Monarca, D.; Moscetti, R.; Massantini, R. Dairy production in restricted environment and safety for the workers. *Ind. Aliment.* **2012**, *530*, 5–12.
17. Monarca, D.; Cecchini, M.; Guerrieri, M.; Colantoni, A. Conventional and alternative use of biomasses derived by hazelnut cultivation and processing. In Proceedings of the VII International Congress on Hazelnut 845, Viterbo, Italy, 23–27 June 2008; pp. 627–634.
18. Monarca, D.; Cecchini, M.; Guerrieri, M.; Santi, M.; Bedini, R.; Colantoni, A. Safety and health of workers: Exposure to dust, noise and vibrations. In Proceedings of the VII International Congress on Hazelnut 845, Viterbo, Italy, 23–27 June 2008; pp. 437–442.
19. Salvati, L.; Colantoni, A. Land use dynamics and soil quality in agro-forest systems: A country-scale assessment in Italy. *J. Environ. Plan. Manag.* **2015**, *58*, 175–188. [CrossRef]
20. Monarca, D.; Cecchini, M.; Colantoni, A.; Marucci, A. Feasibility of the electric energy production through gasification processes of biomass: Technical and economic aspects. In Proceedings of the International Conference on Computational Science and Its Applications, Santander, Spain, 20–23 June 2011; Springer: Berlin/Heidelberg, Germany; pp. 307–315.
21. Monarca, D.; Colantoni, A.; Cecchini, M.; Longo, L.; Vecchione, L.; Carlini, M.; Manzo, A. Energy characterization and gasification of biomass derived by hazelnut cultivation: Analysis of produced syngas by gas chromatography. *Math. Probl. Eng.* **2012**, *2012*. [CrossRef]
22. Marucci, A.; Zambon, I.; Colantoni, A.; Monarca, D. A combination of agricultural and energy purposes: Evaluation of a prototype of photovoltaic greenhouse tunnel. *Renew. Sustain. Energy Rev.* **2018**, *82*, 1178–1186. [CrossRef]
23. Mosconi, E.M. Opportunity and function of energy wholesale market in Italy. *Riv. Giuridica dell'ambiente* **2013**, *18*, 1101–1110.
24. Salerno, M.; Gallucci, F.; Pari, L.; Zambon, I.; Sarri, D.; Colantoni, A. Costs-benefits analysis of a small-scale biogas plant and electric energy production. *Bulg. J. Agric. Sci.* **2017**, *23*, 357–362.
25. Lee, H. Effective Dynamic Control Strategy of a Key Supplier with Multiple Downstream Manufacturers Using Industrial Internet of Things and Cloud System. *Processes* **2019**, *7*, 172. [CrossRef]
26. Parv, L.; Deaky, B.; Nasulea, M.D.; Oancea, G. Agent-Based Simulation of Value Flow in an Industrial Production Process. *Processes* **2019**, *7*, 82. [CrossRef]
27. Hang, L.; Kang, S.H.; Jin, W.; Kim, D.H. Design and Implementation of an Optimal Travel Route Recommender System on Big Data for Tourists in Jeju. *Processes* **2018**, *6*, 133. [CrossRef]
28. Fayaz, M.; Ullah, I.; Kim, D.-H. Underground Risk Index Assessment and Prediction Using a Simplified Hierarchical Fuzzy Logic Model and Kalman Filter. *Processes* **2018**, *6*, 103. [CrossRef]
29. Zambon, I.; Colantoni, A.; Carlucci, M.; Morrow, N.; Sateriano, A.; Salvati, L. Land quality, sustainable development and environmental degradation in agricultural districts: A computational approach based on entropy indexes. *Environ. Impact Assess. Rev.* **2017**, *64*, 37–46. [CrossRef]
30. Zambon, I.; Colantoni, A.; Cecchini, M.; Mosconi, E. Rethinking sustainability within the viticulture realities integrating economy, landscape and energy. *Sustainability* **2018**, *10*, 320. [CrossRef]
31. Zambon, I.; Ferrara, A.; Salvia, R.; Mosconi, E.; Fici, L.; Turco, R.; Salvati, L. Rural Districts between Urbanization and Land Abandonment: Undermining Long-Term Changes in Mediterranean Landscapes. *Sustainability* **2018**, *10*, 1159. [CrossRef]

32. Colantoni, A.; Monarca, D.; Cecchini, M.; Mosconi, E.M.; Poponi, S. Small-Scale Energy Conversion of Agro-Forestry Residues for Local Benefits and European Competitiveness. *Sustainability* **2018**, *11*, 10. [CrossRef]
33. Zambon, I.; Sabbi, A.; Schuetze, T.; Salvati, L. Exploring forest 'fringescapes': Urban growth, society and swimming pools as a sprawl landmark in coastal Rome. *Rend. Lincei* **2015**, *26*, 159–168. [CrossRef]
34. Marucci, A.; Colantoni, A.; Zambon, I.; Egidi, G. Precision farming in hilly areas: The use of network RTK in GNSS technology. *Agriculture* **2017**, *7*, 60. [CrossRef]
35. Bogunovic, I.; Bilandzija, D.; Andabaka, Z.; Stupic, D.; Comino, J.R.; Cacic, M.; Pereira, P. Soil compaction under different management practices in a Croatian vineyard. *Arab. J. Geosci.* **2017**, *10*, 340. [CrossRef]
36. Rodrigo-Comino, J.; Cerdà, A. Improving stock unearthing method to measure soil erosion rates in vineyards. *Ecol. Indic.* **2018**, *85*, 509–517. [CrossRef]
37. Pereira, P.; Cerda, A.; Martin, D.; Úbeda, X.; Depellegrin, D.; Novara, A.; Miesel, J. Short-term low-severity spring grassland fire impacts on soil extractable elements and soil ratios in Lithuania. *Sci. Total Environ.* **2017**, *578*, 469–475. [CrossRef] [PubMed]
38. Pari, L.; Scarfone, A.; Santangelo, E.; Gallucci, F.; Spinelli, R.; Jirjis, R.; Barontini, M. Long term storage of poplar chips in Mediterranean environment. *Biomass Bioenergy* **2017**, *107*, 1–7. [CrossRef]
39. Zambon, I.; Piergentili, A.; Salvati, L.; Monarca, D.; Matyjas-Łysakowska, P.; Colantoni, A. Applied Research for a Safer Future: Exploring Recent Job Accidents in Agriculture, Italy (2012–2017). *Processes* **2018**, *6*, 87. [CrossRef]
40. Colantoni, A.; Marucci, A.; Monarca, D.; Pagniello, B.; Cecchini, M.; Bedini, R. The risk of musculoskeletal disorders due to repetitive movements of upper limbs for workers employed to vegetable grafting. *J. Food Agric. Environ.* **2012**, *10*, 14–18.
41. Marucci, A.; Monarca, D.; Cecchini, M.; Colantoni, A.; Biondi, P.; Cappuccini, A. The heat stress for workers employed in laying hens houses. *J. Food Agric. Environ.* **2013**, *11*, 20–24.
42. Marucci, A.; Pagniello, B.; Monarca, D.; Cecchini, M.; Colantoni, A.; Biondi, P. Heat stress suffered by workers employed in vegetable grafting in greenhouses. *J. Food Agric. Environ.* **2012**, *10*, 1117–1121.
43. Huh, J.H.; Koh, T.; Seo, K. Design of a Shipboard Outside Communication Network and Its Testbed Using PLC: For Safety Management during the Ship Building Process. *Processes* **2018**, *6*, 67. [CrossRef]
44. Cerezo-Narváez, A.; García-Jurado, D.; González-Cruz, M.C.; Pastor-Fernández, A.; Otero-Mateo, M.; Ballesteros-Pérez, P. Standardizing Innovation Management: An Opportunity for SMEs in the Aerospace Industry. *Processes* **2019**, *7*, 282. [CrossRef]
45. Imran, M.; Salisu, I.; Aslam, H.D.; Iqbal, J.; Hameed, I. Resource and Information Access for SME Sustainability in the Era of IR 4.0: The Mediating and Moderating Roles of Innovation Capability and Management Commitment. *Processes* **2019**, *7*, 211. [CrossRef]
46. Huang, C.J.; Chicoma, T.; Denisse, E.; Huang, Y.H. Evaluating the Factors that are Affecting the Implementation of Industry 4.0 Technologies in Manufacturing MSMEs, the Case of Peru. *Processes* **2019**, *7*, 161. [CrossRef]
47. Türkeș, M.C.; Oncioiu, I.; Aslam, H.D.; Marin-Pantelescu, A.; Topor, D.I.; Căpușneanu, S. Drivers and Barriers in Using Industry 4.0: A Perspective of SMEs in Romania. *Processes* **2019**, *7*, 153. [CrossRef]
48. Ko, J.S.; Huh, J.H.; Kim, J.C. Improvement of Temperature Control Performance of Thermoelectric Dehumidifier Used Industry 4.0 by the SF-PI Controller. *Processes* **2019**, *7*, 98. [CrossRef]
49. Sevinç, A.; Gür, S.; Eren, T. Analysis of the Difficulties of SMEs in Industry 4.0 Applications by Analytical Hierarchy Process and Analytical Network Process. *Processes* **2018**, *6*, 264. [CrossRef]
50. Müller, J.M.; Däschle, S. Business Model Innovation of Industry 4.0 Solution Providers Towards Customer Process Innovation. *Processes* **2018**, *6*, 260. [CrossRef]
51. Huh, J.-H.; Kim, K.-Y. Time-Based Trend of Carbon Emissions in the Composting Process of Swine Manure in the Context of Agriculture 4.0. *Processes* **2018**, *6*, 168. [CrossRef]
52. Huh, J.-H.; Lee, H.G. Simulation and Test Bed of a Low-Power Digital Excitation System for Industry 4.0. *Processes* **2018**, *6*, 145. [CrossRef]
53. Monarca, D.; Cecchini, M.; Colantoni, A. Plant for the production of chips and pellet: Technical and economic aspects of an case study in the central Italy. In Proceedings of the International Conference on Computational Science and Its Applications, Santander, Spain, 20–23 June 2011; Springer: Berlin/Heidelberg, Germany; pp. 296–306.

54. Ahmad, S.; Malik, S.; Ullah, I.; Fayaz, M.; Park, D.H.; Kim, K.; Kim, D. An Adaptive Approach Based on Resource-Awareness Towards Power-Efficient Real-Time Periodic Task Modeling on Embedded IoT Devices. *Processes* **2018**, *6*, 90. [CrossRef]
55. Park, S.; Huh, J.H. Effect of Cooperation on Manufacturing IT Project Development and Test Bed for Successful Industry 4.0 Project: Safety Management for Security. *Processes* **2018**, *6*, 88. [CrossRef]
56. Zambon, I.; Cecchini, M.; Egidi, G.; Saporito, M.G.; Colantoni, A. Revolution 4.0: Industry vs. Agriculture in a Future Development for SMEs. *Processes* **2019**, *7*, 36. [CrossRef]
57. Reis, M.S. Multiscale and Multi-Granularity Process Analytics: A Review. *Processes* **2019**, *7*, 61. [CrossRef]
58. Uslu, B.; Eren, T.; Gür, Ş.; Özcan, E. Evaluation of the Difficulties in the Internet of Things (IoT) with Multi-Criteria Decision-Making. *Processes* **2019**, *7*, 164. [CrossRef]
59. Jung, S.; Yoon, Y.T. Optimal Operating Schedule for Energy Storage System: Focusing on Efficient Energy Management for Microgrid. *Processes* **2019**, *7*, 80. [CrossRef]
60. Lee, H.G.; Huh, J.H. A Cost-Effective Redundant Digital Excitation Control System and Test Bed Experiment for Safe Power Supply for Process Industry 4.0. *Processes* **2018**, *6*, 85. [CrossRef]