| Source & Tittle | Problem | Purpose | Methods | Finding (Dari Kesimpulan &/ Abstrak) | Future Works (dari Saran) | Jurnal |
| --- | --- | --- | --- | --- | --- | --- |
| Risk Management |  |  |  |  |  |  |
| Artificial intelligence, systemic risks, and sustainability (Galaz, dkk., 2021) | Investments into applications of AI technologies in agriculture, forestry and the extraction of marine resources also seem to be increasing rapidly. Despite a growing interest in, and deployment of AI-technologies in domains critical for sustainability, few have explored possible systemic risks in depth.  —  **Investasi untuk penerapan teknologi AI di bidang pertanian, kehutanan, dan ekstraksi sumber daya laut tampak meningkat pesat. Meskipun ada minat yang meningkat, dan penyebaran teknologi AI di domain yang penting untuk keberlanjutan (*sustainability*), hanya sedikit yang mengeksplorasi kemungkinan risiko sistemik secara mendalam.** | * global overview of the progress of such technologies in sectors with high impact potential for sustainability like farming, forestry and the extraction of marine resources. * identify possible systemic risks in these domains:   + a) algorithmic bias and allocative harms;   + b) unequal access and benefits;   + c) cascading failures and external disruptions, and   + d) trade-offs between efficiency and resilience.   —  meninjau secara global tentang kemajuan teknologi di sektor-sektor yang berpotensi untuk berdampak tinggi pada *sustainability* (keberlanjutan) seperti pertanian, **kehutanan, dan ekstraksi sumber daya laut.**  —  mengidentifikasi kemungkinan risiko sistemik dalam domain:  a) bias algoritmik dan kerugian alokatif;  b) ketidaksetaraan akses dan keuntungan;  c) kegagalan kecil dan gangguan eksternal, dan  d) pertukaran antara efisiensi dan resiliensi. |  | * On the technological side, leaps forward in predictive analysis through various forms of AI-methods, IoT-systems, satellite technologies, increasing computational capacity, and new developments in robotics industries, have paved the way for new approaches to efficiency, productivity, and decision making under uncertainty. * the most rapid development of AI and associated technologies in the sustainability domain, seem to be unfolding in farming, → USA & China   —  **Dalam sisi teknologi, analisis prediktif melalui berbagai bentuk dari metode AI, sistem IoT, teknologi satelit, dan pengembangan baru pada industri robotik telah membuka jalan pada pendekatan-pendekatan baru untuk efisiensi, produktivitas, dan pengambilan keputusan pada kondisi yang tidak tentu.**  —  **Pengembangan paling cepat pada AI dan teknologi-teknologi yang diasosiasikan dalam domain *sustainability*, dapat terlihat pada bidang pertanian, utamanya di USA & China** | * how to best govern these technologies from a sustainability perspective need to acknowledge the complex features of ecosystems, their fundamental importance for human development, and the pressures they face under accelerating climate change. * the possible negative distributional implications of increased applications of AI-technologies on social groups that depend directly on the resources and services provided by these ecosystems on land- and seascapes.   —  [cara terbaik mengatur teknologi ini dari perspektif keberlanjutan: perlu mempertimbangkan fitur yang kompleks dari ekosistem, kepentingan fundamentalnya bagi pembangunan manusia, dan tekanan yang manusia hadapi di bawah percepatan perubahan iklim.  —  kemungkinan implikasi distribusi negatif dari peningkatan penerapan teknologi AI pada kelompok sosial yang bergantung langsung pada sumber daya dan layanan yang disediakan oleh ekosistem ini di darat dan laut. | Technology in Society (Elsevier) |
| A reinforcement learning-based framework for disruption risk identification in supply chains  (Aboutorab, dkk., 2021) | Undertaking this step manually, however, is tedious and  time-consuming. With the increased sophistication and capability of advanced computing algorithms,  various eminent supply chain researchers have called for the use of artificial intelligence techniques  to increase efficiency and efficacy when performing their tasks.  —  **identifikasi risiko manual sangat memakan waktu, dengan adanya kecanggihan dan kemampuan komputasi algoritma tingkat lanjut, berbagai peneliti SC mulai menggunakan teknik-teknik AI untuk meningkatkan efisiensi dan efikasi dalam meningkatkan performa tugasnya.** | * demonstrate how reinforcement learning, which is one of the recent artificial intelligence techniques, can assist risk managers to proactively identify the risks to their operations. * We explain the working of our proposed Reinforcement Learning-based approach for Proactive Risk Identification (RL-PRI) and its various steps. * We then show the performance accuracy of RL-PRI in identifying the risk events of interest by comparing its output with the risk events which are manually identified by professional risk managers.   —  menunjukkan bagaimana ***reinforcement learning*, yang merupakan salah satu teknik AI terbaru, dapat membantu manajer risiko untuk secara proaktif mengidentifikasi risiko operasi** mereka.  —  **Kami menjelaskan cara kerja pendekatan berbasis *Reinforcement Learning* yang kami usulkan untuk Identifikasi Risiko Proaktif (RL-PRI) dan berbagai langkahnya.**  **—**  **Kami kemudian menunjukkan akurasi kinerja RL-PRI dalam mengidentifikasi kejadian risiko yang menarik dengan membandingkan keluarannya dengan kejadian risiko yang diidentifikasi secara manual oleh manajer risiko profesional.** | * Prepping modules: data preparation, data collection, entity recognition, and RL-based recommender system. * working modules’ details: selecting terms, Collecting news articles related to the risk event terms, Augmenting the News database with different types of entities in the Entity Recognition Module, Determining which news to be shown to the risk manager in the RL-based Recommender Module, Receiving the feedback of the risk manager and calculating the rating values in the RL-based Recommender Module | * RL-PRI, which is an RL-based approach that assists risk managers in the proactive identification of disruption risk events in their operations. * The experiments show the effectiveness of the RL-PRI approach in risk identification using artificial intelligence techniques to facilitate the efficacy of supply chain operations.   —  RL-PRI, yang merupakan pendekatan berbasis *Reinforcement Learning* yang membantu manajer risiko dalam mengidentifikasi secara proaktif peristiwa risiko gangguan dalam operasi mereka.  —  **Eksperimen menunjukkan keefektifan pendekatan RL-PRI dalam identifikasi risiko menggunakan teknik kecerdasan buatan untuk memfasilitasi keefektifan operasi SC.** | * In Module 1, we utilised the Cambridge Taxonomy of Business Risks to identify the disruption risk events, however a broader taxonomy can be investigated to detect other types of risk events. * Module 2 can be improved by expanding the number of news sources, especially local news sources from the location of interest. Another source of information that can be considered for more extensive exploration is social media. In addition, this module can be further developed by applying semantic analysis to remove ineffective information such as multiple articles with the same meaning but different wording. * Module 3 can be improved by utilising appropriate NLP APIs for the more precise extraction of entities. This will increase the performance of the RL module. * In Module 4, different RL algorithms can be used to select the best possible action in each state. For example, to speed up the learning process and to perform in a more complex environment, methods such as the Deep Deterministic Policy Gradient (DDPG) [36] and Asynchronous Advantage Actor–Critic (A3C) can be implemented. | Future Generation Computer Systems (Elsevier) |
| (Editorial) Risk-aware supply chain intelligence: AI-enabled supply chain and logistics management  considering risk mitigation  (Wei Yan, dkk., 2019) | As modern supply chains and logistics systems are dynamic, complexly networked and sometimes difficult to model using mathematical tools, their efficient management becomes a challenging task and often requires rich information, mass data and intensive human knowledge to accomplish.  —  Karena **SC modern dan sistem logistik bersifat dinamis, jaringan kompleks, dan terkadang sulit untuk dimodelkan menggunakan alat matematika, manajemen efisien mereka menjadi tugas yang menantang dan seringkali membutuhkan informasi yang kaya, data massal, dan pengetahuan manusia yang intensif untuk menyelesaikannya.** | incorporates articles using intelligent approaches to solve various supply chain problems where risk factors are taken into consideration.  —  menggabungkan artikel menggunakan pendekatan AI untuk memecahkan berbagai masalah SC di mana faktor risiko dipertimbangkan. |  | * risk-aware supply chain intelligence mainly incorporate two types of research:   + related with optimization under uncertainty, where uncertainty is considered as risk and usually modeled using random variables.   + risk assessment, which involves the identification, measurement and quantification of risk factors. * 6 articles:   + Zhen et al., in the paper “Capacitated closed-loop supply chain network design under uncertainty,”   + He et al., in the paper “Yard crane scheduling problem in a container terminal considering risk caused by uncertainty,”   + Xu et al., in the paper “Data-driven operational risk analysis in e-commerce logistics,”   + Ali et al., in the paper “Risk assessment of China-Pakistan Fiber Optic Project (CPFOP) in the light of Multi-Criteria Decision Making (MCDM),”   + Song et al., in the paper “Cross-border e-commerce commodity risk assessment using text mining and fuzzy rule-based reasoning,”   + Zhang et al., in the paper “Locating electric vehicle charging stations with service capacity using the improved whale optimization algorithm,” → considering service risk including the risk of service capacity and user anxiety.   —  **kecerdasan yang memperhitungkan risiko dalam SC utamanya menggunakan dua jenis penelitian:**   * **terkait dengan optimasi di bawah ketidakpastian, dimana ketidakpastian dianggap sebagai risiko dan biasanya dimodelkan menggunakan variabel acak.** * **penilaian risiko, yang melibatkan identifikasi, pengukuran dan kuantifikasi faktor risiko.** | The theories and methodologies of risk-aware supply chain intelligence, presented in the special track, can help to improve the efficiency and efficacy of supply chain and logistics management, especially in the practical environment with various risks.  —  Teori dan metodologi kecerdasan yang mempertimbangkan risiko dalam SC, dapat membantu meningkatkan efisiensi dan efikasi SC dan manajemen logistik, terutama di lingkungan praktis dengan berbagai risiko. | Advanced Engineering Informatics  (Elsevier) |
| Examining the influence of big data analytics and additive manufacturing  on supply chain risk control and resilience: An empirical study  (Gupta, dkk., 2022) |  | tests whether fourth industrial revolution (4IR) technologies such as big data analytics (BDA) and additive manufacturing (AM) control risks and develop supply chain (SC) resilience under flexible orientation and control orientation.  —  menguji apakah **teknologi revolusi industri keempat (4IR) seperti *big data analytics* (BDA) dan manufaktur aditif (AM) dapat mengendalikan risiko dan mengembangkan ketahanan rantai pasokan (SC) di bawah orientasi fleksibel dan orientasi kontrol.** | data was collected from 190 samples in India and the PLS-SEM technique was then used to perform data analysis.  —  **data diambil dari 190 sampel di India dan data dianalisis dengan teknik PLS-SEM** | * BDA and AM can aid in risk control and in turn improve the SC resilience of a firm and further minimize the propagation of the supply chain ripple effect in case of disruption.   —  **BDA dan AM dapat membantu dalam pengendalian risiko dan dapat meningkatkan ketahanan SC perusahaan, dan meminimalkan penyebaran *ripple effect* SC jika terjadi gangguan**. | * Future studies can include a modification of the theoretical model by including other 4IR technologies (resources) and conduct data collection from developed nations to further compare the results. * The model can also be extended by examining contingency-based supply base complexity. * Future researchers can also examine the effect of institutional pressures on the resources (big data analytics and additive manufacturing), which further influences risk control and performance outcome (SC resilience).   —  Studi selanjutnya dapat mencakup modifikasi model teoretis dengan memasukkan teknologi 4IR lainnya dan melakukan pengumpulan data dari negara maju untuk membandingkan hasilnya lebih lanjut.  —  Model ini juga dapat diperluas dengan memeriksa kompleksitas basis pasokan berbasis kontingensi.  —  Peneliti di masa yg akan datang juga dapat menguji pengaruh tekanan institusional pada sumber daya (analitik data besar dan manufaktur aditif), yang selanjutnya memengaruhi pengendalian risiko dan hasil kinerja (ketahanan SC). | Computers & Industrial Engineering (Elsevier) |
| Risk Prediction of Digital Transformation of  Manufacturing Supply Chain Based on Principal  Component Analysis and Backpropagation  Artificial Neural Network  (Liu, 2021) | However, the digital transformation of the MSC is highly uncertain, owing to the dynamic and complex changes of its nodes and structure in response to growing customer demand and fierce market competition.  —  **transformasi digital MSC sangat tidak pasti, karena perubahan yang dinamis dan kompleks dari cabang dan strukturnya sebagai respons terhadap permintaan pelanggan yang terus meningkat dan persaingan pasar yang ketat.** | to help manufacturing companies in China to successfully switch to a digital MSC.  —  **untuk membantu perusahaan manufaktur di China agar berhasil beralih ke MSC digital.** | * Firstly, the risk sources of the MSC digitization were identified, and complied into an evaluation index system for the digital transformation of the MSC. * Next, the principal component analysis (PCA) was performed to reduce the dimension of the original data by revealing the three key principal components, and then the characteristic parameters of risk prediction are selected, so as to simplify the structure of neural network and improve the speed and efficiency of network training. * On this basis, a backpropagation neural network (BPNN) was constructed for predicting the risks in MSC digitization.   —  **Pertama, sumber-sumber risiko dari digitalisasi MSC diidentifikasi, dan disesuaikan ke dalam sistem indeks evaluasi untuk transformasi digital MSC.**  **—**  **Selanjutnya, analisis komponen utama (PCA) dilakukan untuk mengurangi dimensi data asli dengan mengungkapkan tiga komponen utama, dan kemudian memilih parameter karakteristik prediksi risiko, sehingga dapat menyederhanakan struktur jaringan dan meningkatkan kinerja. kecepatan dan efisiensi pelatihan jaringan.**  **—**  **Atas dasar ini, dibangun jaringan *backpropagation neural network* (BPNN) untuk memprediksi risiko dalam digitalisasi MSC.** | * BPNN (backpropagation neural network) model has a good predictive effect. * The comparison demonstrates that our model achieved better effect than the traditional artificial neural network (ANN) model in risk prediction. * the selected three principal components are reasonable, and the evaluation index system is valuable.   —  **Model BPNN (backpropagation neural network) memiliki efek prediksi yang baik.**  **—**  **Perbandingan menunjukkan bahwa model kami mencapai efek yang lebih baik daripada model *artificial neural network* (ANN) tradisional dalam prediksi risiko.**  **—**  **komponen utama yang dipilih adalah masuk akal (*reasonable*), dan sistem indeks evaluasi.** | The follow-up research will further improve our prediction model.  For example, the size, diversity, and quality of samples will be  increased; the evaluation index system will be verified through  even more tests, and adjusted to enhance its applicability to  real-world scenarios.  —  Penelitian lanjutan akan lebih meningkatkan model prediksi kami.  Misalnya, ukuran, keragaman, dan kualitas sampel  ditingkatkan; sistem indeks evaluasi akan diverifikasi melalui  bahkan lebih banyak tes, dan disesuaikan untuk meningkatkan penerapannya  skenario dunia nyata. | Alexandria Engineering Journal (Elsevier) |
| Supply chain disruption during the COVID-19 pandemic:  Recognizing potential disruption management strategies  (Moosavi, dkk., 2022) | However, there is still a lack of systematic literature survey studies that aim to identify promising SC disruption management strategies through the bibliometric, network, and thematic analyses.  —  masih ada kekurangan studi survei literatur sistematis yang bertujuan untuk mengidentifikasi strategi manajemen gangguan SC yang menjanjikan melalui analisis bibliometrik, jaringan, dan tematik. | presents a set of up-to-date bibliometric, network, and thematic analyses to identify the influential contributors, main research streams, and disruption management strategies related to the SC performance under the COVID-19 settings.  —  menyajikan serangkaian analisis bibliometrik, jaringan, dan tematik terkini untuk mengidentifikasi kontributor berpengaruh, aliran penelitian utama, dan strategi manajemen gangguan yang terkait dengan kinerja SC di masa COVID-19. |  | resilience and sustainability are the primary SC topics. Furthermore, the major research themes are found to be food, health-related SCs,  and technology-aided tools (e.g., artificial intelligence (AI), internet of things (IoT), and block-chains). Various disruption management strategies focusing on resilience and sustainability themes are extracted from the most influential studies that were identified as a part of this work.  —  ketahanan dan keberlanjutan adalah topik SC utama. Selain itu, tema penelitian utama yang ditemukan adalah makanan, SC terkait kesehatan, dan alat bantu teknologi (misalnya, kecerdasan buatan (AI), internet of things (IoT), dan rantai blok). Berbagai strategi manajemen gangguan yang berfokus pada tema ketahanan dan keberlanjutan diambil dari studi paling berpengaruh yang diidentifikasi sebagai bagian dari pekerjaan ini. | * some of the identified aspects within the collected studies were discussed less than the others and could be further investigated in the future studies. For example, technology was revealed as a cluster but less considered by the most-cited articles. So, using technology to manage the SC disruptions or investigating technology-driven strategies could be an interesting future research direction. * Furthermore, the future research could concentrate more on uncertainty modeling approaches in various SC operations under the COVID-19 settings (e.g., evaluation of different approaches for modeling uncertainty in supply, demand, delivery times, manufacturing times, etc.). * Promising uncertainty modeling approaches would be critical for an effective design of robust SCs during the COVID-19 pandemic and other major disruptive events.   —  beberapa aspek yang teridentifikasi dalam studi yang dikumpulkan dibahas lebih sedikit dari yang lain dan dapat diselidiki lebih lanjut dalam studi selanjutnya. Misalnya, teknologi terungkap sebagai klaster tetapi kurang diperhatikan oleh artikel yang paling banyak dikutip. Jadi, menggunakan teknologi untuk mengelola gangguan SC atau menyelidiki strategi berbasis teknologi bisa menjadi arah penelitian masa depan yang menarik.  —  Selain itu, penelitian di masa mendatang dapat lebih berkonsentrasi pada pendekatan pemodelan ketidakpastian di berbagai operasi SC di bawah pengaturan COVID-19 (misalnya, evaluasi berbagai pendekatan untuk pemodelan ketidakpastian dalam penawaran, permintaan, waktu pengiriman, waktu produksi, dll.).  —  Pendekatan pemodelan ketidakpastian yang menjanjikan akan sangat penting untuk desain SC yang kuat dan efektif selama pandemi COVID-19 dan peristiwa-peristiwa besar lainnya yang mengganggu. | International Journal of Disaster Risk Reduction (Elsevier) |
| Explainability in supply chain operational risk management: A  systematic literature review  (Nimmy, dkk., 2022) | all of these techniques are black box in their working nature. This means that the chosen technique cannot explain why it has given that output and whether it is correct and free  from bias.  —  semua teknik ini adalah kotak hitam dalam sifat kerjanya. Artinya, teknik yang dipilih tidak dapat menjelaskan mengapa menghasilkan keluaran tersebut dan apakah sudah benar dan bebas dari bias. | systematic literature review on the techniques used to determine operational risks and analyse whether they satisfy the requirement of them being explainable.  —  tinjauan literatur sistematis tentang teknik yang digunakan untuk menentukan risiko operasional dan menganalisis apakah mereka memenuhi persyaratan yang dapat dijelaskan. |  | * supply chain researchers should explore this potential of AI techniques in realizing proactive, predictive and real-time SCORM (supply chain operational risk management). * Researchers should move from using a black-box-based technique to a more sophisticated, trustworthy and explainable technique that will assist in making auditable SCORM decisions. * Using such techniques, SCORM researchers can monitor the future hazards with accuracy and gain confidence to enhance strategic plans in an explainable way.   —  peneliti SC harus mengeksplorasi potensi teknik AI ini dalam mewujudkan SCORM (manajemen risiko operasional rantai pasokan) yang proaktif, prediktif, dan real-time.  —  Peneliti harus beralih dari menggunakan teknik berbasis kotak hitam ke teknik yang lebih canggih, dapat dipercaya dan dapat dijelaskan yang akan membantu dalam membuat keputusan SCORM yang dapat diaudit.  —  Dengan menggunakan teknik tersebut, peneliti SCORM dapat memantau bahaya di masa depan dengan akurat dan mendapatkan kepercayaan diri untuk menyempurnakan rencana strategis dengan cara yang dapat dijelaskan. | for a complete analysis of the different AI techniques used in SCM and the management of the different risks, a deep  analysis of other articles needs to be conducted.  —  untuk analisis lengkap dari berbagai teknik AI yang digunakan dalam SCM dan manajemen risiko yang berbeda,  analisis artikel lain dg mendalam perlu dilakukan. |  |
| Disruption |  |  |  |  |  |  |
| Workforce and supply chain disruption as a digital and technological  innovation opportunity for resilient manufacturing systems in the  COVID-19 pandemic  (Ambrogio, dkk., 2022) | During the SARS-CoV-2 pandemic (also known as COVID-19), workforce downsizing needs, safety requirements, supply chain breaks and inventory shortages affected manufacturing systems’ and supply chain’s responsiveness and resilience. Companies wandered in a disrupted scenario because recommended actions/strategies to survive – and thrive – were not available an improvised actions to keep their operations up and running. | analyzes the COVID-19 impacts on the workforce and supply resilience in a holistic manner:   * (i) how can manufacturing firms cope with urgent staff deficiencies while sustaining at the same time a healthy and safe workforce in the perspective of socially sustainable and human- centric cyber-physical production systems?; * (ii) is remote working (cf. smart working) applicable to shop-floor workers?; * (iii) is it possible to overcome supply chain breaks without stopping production? |  | * Lesson #1: Digital manufacturing is not reducing, rather asking for more workers in a pandemic. * Lesson #2: Workplace design and space architecture will evolve towards a harmonic innovation paradigm. * Lesson #3: The digital toolbox is a promising set of solutions and strategies for a robust and resilient workforce. * Lesson #4: The benefits of the adoption of the digital toolbox will counterbalance (or overcome) the implementation costs. * Lesson#5: What is disruption today (e.g. pandemic) can be an opportunity to create a sustainable and healthy workforce inspired by the principles of harmonic innovation and digital humanism. * Lesson#6: Industrial systems and work designers have to examine human values and ethical aspects a priori, so that they are not construed as costs, but instead as design requirements. * Lesson#7: Making every place your own workplace may have social and psychological impacts. |  | Computers & Industrial Engineering (Elsevier) |
| Managing supply chain disruption threat via a strategy combining pricing  and self-protection  (Liu, dkk., 2022) | In the past decade, supply chain disruptions continue to impact firms in different ways. To reduce such negative impacts, firms may take proactive actions to lower the probability of disruption. | we study how firms can mitigate supply chain disruption threat by optimizing pricing decisions and launching proactive actions in the form of effort investment jointly. |  | * In the effort-price scenario, we find that both the supplier and the retailer invest in effort, and the supply chain is better off in the simultaneous effort investment game than in the sequential effort investment game. * In the sequential effort investment game, the party that first invests effort is better off than in the simultaneous effort investment game. * In the price-effort scenario, we find that only the retailer invests effort, and the supply chain’s profit under single-effort investment is greater than under joint- effort investment when the sensitivity of the probability of operational failure to the retailer’s effort is large enough. | * One future research direction would be to examine how the risk attitude of the firms, e.g., risk aversion, affects their decision-making. * Another possible research direction is to generalize deterministic demand into stochastic demand or endogenous demand that depends on the probability of interruption; the pricing decisions will accordingly become more complicated but more realistic. In addition, we can consider a multi-supplier setting with different investment costs to study the competition between suppliers and consider different procurement strategies. * Finally, in this paper we only consider firm’s single-period decision. Another possibility would be to consider a multi- period setting. It would be interesting to investigate how the recovery duration, accumulative investment, and long-term partnership affect corporate effort investments. | International Journal of Production Economics (Elsevier) |
| Modelling of supply chain disruption analytics using an integrated  approach: An emerging economy example  (Ali, dkk., 2021) |  | to develop a framework to identify, analyze, and to assess supply chain disruption factors and drivers. |  |  | that political and regulatory instability, cyclones, labor strikes, flooding, heavy rain, and factory fires are the top six disruption drivers causing disruptions to the ready-made garment industry in Bangladesh. | Expert Systems With Applications (Elsevier) |
| IoT |  |  |  |  |  |  |
| Artificial intelligence and internet of things in small and medium-sized  enterprises: A survey  (Hansen & Bøgh, 2021) | **However, small and medium-sized enterprises (SMEs) are considered the economic backbone of many countries, which is why it is increasingly important that these kinds of companies also have easy access to these technologies and can make them operational.** | **presents a comprehensive survey and investigation of how widespread AI and IoT are among manufacturing SMEs, and discusses the current limitations and opportunities towards enabling predictive analytics.** |  | * Machine-wise implementation is cheaper compared to full production-wise implementation, and there- fore SMEs should initially pursue this implementation. * The survey also showed that SMEs need to be at the forefront of this new industrial revolution if they want to stay compet- itive. Moreover, they should have an open mind regarding new business models and embrace knowledge sharing methods such as open innovation. * We also discovered that many of the successful use cases were the low costs and simple implementation of IoT and cloud solutions. | focus on making other parts of Industry 4.0, such as IoT and AI, more simple to use and implement. This could be in the form of off-the-shelves product that is easy to implement at a given produc- tion aspect without the need for computer scientists to set up. | Journal of Manufacturing Systems (Elsevier) |
| The Application of Smart Supply Chain Technologies in The Moroccan Logistics (Chbaik, dkk., 2022) |  | present, initially, a global view of the Moroccan industry classification according to its Gross Domestic Product, then, studying the percentage of major contributions of the industrial branches. In addition to that, to design a survey about the application of smart supply chain technologies in the Moroccan industry. |  | * **The implementation of smart technologies at industrial manufacturers, such as Internet of Things and Blockchain tools, has shown a significant improvement in performance.** * **However their investment cost, smart technologies lead to significant advantages in terms of productivity, performance and profit.** * **One of these new technologies is the accessibility of the 5G network which is becoming a faster highway in the digital world. It presents an opportunity to design new models under IoT concept, integrating 5G devices with the data security of the blockchain. These models allow a more developed supervision of the supply chain management, in particular on the Moroccan industry.** |  | Procedia Computer Science (Elsevier) |
| Circulation traceability system of Chinese herbal medicine supply chain based on internet of things agricultural sensor (He & Shi, 2021) | In order to promote the standardized production of Chinese herbal medicine, we should take effective quality control on its production, processing and purchase. It is difficult to control the production quality and production standards of various Chinese herbal medicines planted separately. | paper puts forward the research of Chinese herbal medicine supply chain circulation traceability system based on Internet of things agricultural sensor. |  | * Chinese herbal medicine supply chain circulation traceability system based on the Internet of things agricultural sensor can significantly improve the circulation efficiency of Chinese herbal medicine. * It not only reduces the circulation cost of Chinese herbal medicine, but also enables Chinese herbal medicine suppliers, manufacturers and sellers to enjoy accurate and convenient Chinese herbal medicine supply services. |  | Sustainable Computing: Informatics and Systems (Elsevier) |
| Warehousing 4.0: A proposed system of using node-red for applying internet of things in warehousing (Hamdy, dkk., 2022) |  | a system is proposed to implement the approach of Internet of Things in warehousing management by using Node-RED and MongoDB. | * The system illustrates how IoT can be implemented in a warehouse to gain benefits and to avoid the drawbacks of traditional warehouse management systems. * For illustration, a dataset was used to show how IoT has a great impact on the warehouse operations, especially on the forecasting accuracy. | * It helps in providing real-time visibility of everything in the warehouse, increasing speed and efficiency, decreasing manual manpower, and preventing inventory shortage and counterfeiting. * This research provides an effective roadmap for enterprises to improve their warehouses by using the Internet of Things. |  | Sustainable Futures (Elsevier) |
| The potentials of combining Blockchain technology and Internet of Things for digital reverse supply chain: A case study (Hrouga, dkk., 2022) | Asbestos has been considered as a hazardous waste in France since 1997 and it is neither recyclable nor recoverable. | to minimize the environmental regulations impact, the treatment of asbestos requires tools and new information technology (IT) enabling real- time information sharing with all reverse supply chain (RSC) actors.  This study aims at integrating and combining Blockchain and IoT to digitize RSC for asbestos waste  treatment. | * First, we investigate the roles and impacts of Blockchain and IoT on forward and reverse supply chain performances. * Second, we propose two new conceptual models for both open and close loop digital RSC. * Finally, to demonstrate the feasibility and effectiveness of integration and combination of these digital technologies, we propose a case study for asbestos waste management. | * The results show that the combination of Blockchain and IoT can be implemented to provide robust digital RSC. * The integration of IoT sensors to monitor connected containers has brought a significant gain in the management of numerous regulations and security constraints. * It also allowed us to identify the improvements and the importance of integrating techno- logical tools such as Blockchain, IoT, and different IS. * The study also revealed inconsistencies in regulations texts with an absence of clear rules for the asbestos treatment. |  | Journal of Cleaner Production (Elsevier) |
| A systematic literature review of supply chain decision making supported by the Internet of Things and Big Data Analytics (Koot, 2021) |  | 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). * typically measuring devices are integrated with more traditional ICT infrastructures to either visualize the current way of operating, or to better predict the system’s future state. * Neural networks, statistics, and BI techniques are the most popular techniques applied within IoT networks, which empowers supply chain decision makers with real-time monitoring capabilities at an operational level. * the construction of resilient supply chains seems to be the driving force in today’s SCM research, resulting into the integration of IoT and BDA techniques to either detect or predict deviations from the operational planning. | new research direction to be pursued in the SCM discipline, which concerns the empowerment of physical objects with more context-aware data gathering devices to keep track of their variable status in real-time (e.g., identification tags, location receivers, multi-agent systems). | **Computers & Industrial Engineering (Elsevier)** |
| Integrated blockchain and internet of things in the food supply chain: Adoption barriers (Kumar, dkk., 2022) | Indian organizations are experiencing problems in implementing the integrated form of BLC-IoT due to limited knowledge and insufficient research. | propose a conceptual framework to reduce the impact of adoption barriers against BLC-IoT in FSC. | Thirteen key barriers were identified after a thorough literature review and consultation with experts. The relationship among barriers was established using Inter- pretive structural modeling (ISM) and Decision-making trial and evaluation laboratory (DEMATEL) methods. | * the lack of government regulation and workers’ low competency significantly influence BLC- IoT adoption. * The results also indicate the intricacy of decision-making by demonstrating that 9 of the 13 barriers were a part of the linkage cluster. * The study also identified lack of resources, lack of public aware- ness, high investment cost, and lack of scalability and interpretability as significant barriers for the adoption of BLC-IoT. * The authorities (government and organization) should start or at least promote skill improvement programs for employees in the food industry (supervisors, managers, and executives) to develop adequate skills needed to address modern technologies. |  | Technovation (Elsevier) |
| Development of cold chain logistics transportation system based on 5G network and Internet of things system (Li, 2021) |  |  | * WSM (Wireless sensor monitoring) is realized by integrating wireless controller FPGA of Xilinx software. * For items that pass through the button position, the scaling effect under integer optimization and the overall economic benefits of transportation still maximize trunk transportation evidence. * Cold chain logistics in the network design of transportation decision-makers provide a specific reference. * freezing temperature monitoring and regular remote tracking of freight container locations are needed to prevent food from being transported under cold chain logistics. * Therefore, the access point (coordination) of GPS and 5G communication systems and wireless sensor network integration is extensive, developed in our project. * It is believed to be based on the proposed Predictive Data Transfer Technology (PDTT) framework and an optimized IoT data model. | * Based on the research, it is found that using predictive data transmission technology (PDTT) in cold chain logistics transportation can keep fruits and vegetables fresh to the greatest extent. * And it can reduce the cost in the transportation process. * Through the research results, we can see that the state of hub type and width type cold chain transportation network has strong advantages. * Automatic system monitoring of cold chain transport items can effectively prolong the shelf life of food. |  | Microprocessors and Microsystems (Elsevier) |
| Green logistics management and supply chain system construction based on internet of things technology (Liu & Ma, 2022). | However, due to the substantial increase in online orders, serious environmental pollution has also appeared in the logistics industry, and the society is paying more and more attention to it. |  |  | * Green logistics is considered to be one of the trends in the future development of logistics industry. * The ultimate goal of green logistics is sustainable development, not only related to the logistics industry, government departments, etc., but also related to consumer rights and social public interests. * It is the unity of economic interests, social interests and environmental interests. * The development of the national economy is showing a steady growth trend, the process of urbanization is accelerating, and people’s awareness of environmental protection is gradually becoming clear. * With the continuous promulgation of relevant national policies, the logistics industry’s development of high efficiency, energy saving and environmental protection must be unstoppable. |  | Sustainable Computing: Informatics and Systems (Elsevier) |
| Risk model of financial supply chain of Internet of Things enterprises: A  research based on convolutional neural network  (Lu & Chen, 2022) | Besides, data is often not transmitted smoothly, and the intermediate offline process is complicated. What is worse, the efficiency is low, and the verification cost is high. | based on supply chain finance, an evolutionary risk model is constructed in this paper. | * Firstly, the income matrix of the regulatory risk model is established, and the convolutional neural network used will pool the training data to the maximum and set the local corresponding normalization layer. * With the help of the evolutionary risk theory, the dynamic equation of the financial supply chain is obtained, forming the dynamic path and abnormal model of strategy selection. * Then, a compact pattern tree is added to the knowledge granularity method to mine data anomalies. * Finally, an experimental platform is built to verify the effectiveness of the method proposed in this paper, and experiments are performed on the accuracy of model evolution conditions, abnormal data identification, and abnormal numerical examples. | * algorithm in this paper is consistent with the set parameters, and the effect is significantly higher than other comparison methods. * The experimental mining time and the comparison method are shortened by 6∼13S. |  | Computer Communications (Elsevier) |
| Decision strategies for the WEEE reverse supply chain under the “Internet  + recycling” model  (Qu, dkk., 2022) | due to lack of supply and demand coordination, the operational performance of the “Internet + recycling” model in WEEE is not ideal. Thus, the question of how to effectively balance the relationship among consumers, recyclers, and the government is of great importance for the establishment of the “Internet + recycling” model. | This paper builds a dual-recycling channel reverse supply chain (RSC) decision model using the Stackelberg game model, and discusses the impact of consumer perception, efforts of online recycler, and government regulations on collection price, quantity, and profit. |  | * increasing the consumer preference for the online recycling channel can enhance the WEEE recovery scale and the profit of the RSC, and the online recycler, through its efforts, can rectify the disadvantage of consumer preference for the online channel. * Government subsidy regulation can promote the enthusiasm of consumers and enterprises for recycling. * Moreover, reward-penalty regulation will disrupt the stability of forward supply chain, while the RSC is more coordinated. |  | Computers & Industrial Engineering (Elsevier) |
| Integrating the Internet of Things in the halal food supply chain: A systematic literature review and research agenda (Rejeb, dkk., 2021) |  | to address this knowledge gap and review IoT research within the context of HFSCs. | over seventy-three (73) papers were analyzed using both bibliometric techniques  and in-depth content analysis. | * IoT offers five major benefits for the HFSC; namely, traceability of products, enhancement of supply chain efficiencies, facilitation of livestock management, authentication of foods’ halal status, and monitoring of halal certifications. * Several challenges were identified, including the technical limitations of IoT devices, technological immaturity, lack of user acceptance, and cost and regulatory barri- ers. |  | Internet of Things (Elsevier) |
| Internet of things enabled the control and  optimization of supply chain cost for unmanned  convenience stores  (Sun, dkk., 2022) | At present, unmanned convenience stores still have to deal with the challenges in operations, including difficulty in landing site selection, immature technology, and low public awareness. The most important issue is the supply chain cost control. |  | The article uses a combination of qualitative analysis and quantitative analysis: a qualitative analysis on the current cost control of unmanned convenience stores, and a quantitative analysis on the supply chain costs incurred in the operation of unmanned convenience stores using flexible budgeting. | With the support of terminal sales data feedback, unmanned convenience stores can also perform more functions that are different from ordinary chain convenience stores, which performs better in minimizing cost. |  | Alexandria Engineering Journal (Elsevier) |
| Identifying and analyzing the barriers of Internet-of-Things in sustainable  supply chain through newly proposed spherical fuzzy geometric mean  (Yu, dkk., 2022) | Many industrial firms have gained strategic benefits from the use of IoT in supply chain (SC) and operations, but still, several firms are reluctant in applying this technology in their firm. | Therefore, this study is going to identify and analyze the most influential barriers faced by firms during the adoption of IoT in attaining sustainable SC. | The novelty of the current research work is the use of Analytical Hierarchy Process (AHP) under spherical fuzzy set to assess those identified barriers which are linked with IoT implementation in the context of sustainable SC. Compared to previously developed extension of fuzzy sets such as Intuitionistic and Pythagorean fuzzy sets, Spherical fuzzy set uses three dimensional membership functions capable of handling more uncertainty and ambiguity of preference given by the decision makers. | * The three major environmental barriers identified are e-waste generation, use of harmful substances and non-degradable resources across their entire life cycle and high energy consumption. * the barriers such as, inability to experiment quickly, inadequate collaboration between IT and lines of business/employee pushback, risk-aversive culture, change manage- ment capabilities and lack of a corporate vision and no overarching strategy for digitalization are the five identified organizational barriers. * To check the influence of these barriers in the implementation of IoT in SC management, this study has used the Analytical Hierarchy Process under spherical fuzzy set as these spherical fuzzy set uses three dimensional membership functions capable of handling the uncertainty and ambiguity of preference given by the decision makers. |  | Computers & Industrial Engineering (Elsevier) |
| Logistics supply chain information collaboration based on FPGA and  internet of things system  (Zhou, dkk., 2021) |  |  |  | * The impact of collaboration is enormous and promises to eliminate high costs through the supply chain network. FPGA (Field-Program- mable Gate Array) use it to achieve our marketing goals, provide the best service, and create an organizational structure called process information. * IOT (Internet of Things) plays a vital role in reducing delays in decision-making and sharing information. The same type of symp- toms appears in the supply chain. * Programmable gate array together and promise the partners’ profits and future a business that promises to have reduced costs, customer and operating costs. * As the supply chain becomes more dependent on technology, suppliers and partner companies will use more technology to strengthen relationships. |  | Microprocessors and Microsystems (Elsevier) |
| Monte Carlo |  |  |  |  |  |  |
| Introduction to Monte Carlo Simulation (Harrison, dkk., 2010) | * Monte Carlo simulation uses random sampling and statistical modeling to estimate mathematical functions and mimic the operations of complex systems * There is no single Monte Carlo method – any attempt to define one will inevitably leave out valid examples – but many simulations follow this pattern:   + - model a system as a (series of) probability density functions (PDFs);   + - repeatedly sample from the PDFs;   + - tally/compute the statistics of interest * Monte Carlo simulation is a key tool for studying analytically intractable problems. Its history dates back to the eighteenth century, but it came into its modern form in the push to develop nuclear weapons during World War II. * Often a single ‘event’ in a simulation will require sampling from many different PDFs, some many times, and be tallied in many ways. * Each sample will require one or more random numbers, and may require converting a uniform random number into a sample from another distribution using the inversion or acceptance-rejection methods. |  |  |  |  |  |
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