

Intelligent Processing and IT Tools for E-Commerce Data, Information, and Knowledge

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Presents recent research and applications in intelligent processing practices and tools for e-commerce data, information and knowledge Includes topics such as knowledge modelling and reasoning for e-commerce, AI-based e-commerce data mining, and blockchain for safety and reliability Provide a forum for experts to disseminate their recent advances and views on future perspectives in the field This book discusses recent research and applications about intelligent processing practices and tools for e-commerce data, information and knowledge. The authors first explain how advances in intelligent processing of data, information and knowledge that has widely been used in ecommerce applications. They then show how this brings new opportunities and challenges for processing e-commerce data, information and knowledge. The book, made up of contributions from both academia and industry, aims to present advances in artificial intelligence to collect, process, and mining Data, information and knowledge, such as new algorithms and techniques in the field, foundational theory and systems, as well as practical e-commerce applications. Some of the topics discussed include AI for e-commerce, such as machine learning, deep learning; personalized service recommendation to e-commerce; modeling, description, and verification for data, information and knowledge; and task scheduling and performance optimization for large-scale concurrency.

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Preface

With the rapid development of 5G and mobile devices, there are many new e-commerce systems used in our daily life, such as wireless payment and recommender systems. Along with this, a large number of Data, Information, and Knowledge have emerged, with features of complexity, diversity, and crossover. How to use Intelligent Processing to handle E-Commerce Data, Information, and Knowledge is a new opportunity and challenge. AI for e-commerce, such as machine learning and deep learning, can be used in information modeling, data mining, knowledge description, and system verification.

The book, including six chapters made up of contributions from the academic and industry, aims to present advances in artificial intelligence to collect, process, and mining Data, Information, and Knowledge.

The first chapter, titled Distant Supervision for E-Commerce Query Segmentation via Attention Network, introduces that the booming online e-commerce platforms demand highly accurate approaches to segment queries that carry the product requirements of

consumers. And the supervised methods, especially those based on deep learning, are attractive for achieving better performance on the problem of query segmentation. However, the lack of labeled data is still a big challenge for training a deep segmentation network, and the problem of Out-of- Vocabulary (OoV) also adversely impacts the performance of query segmentation. To deal with the two challenges, the authors employ the idea of distant supervision and design a novel method to find contexts in external documents and extract features from these contexts. They propose a BiLSTM-CRF-based model with an attention module to encode external features, such that external context information can be utilized naturally and effectively to help query segmentation.

The second chapter, titled Volunteer Task Recommender in Humanitarian Supply Chain for Effective Disaster Management, discusses that due to heterogeneous profiles and versatile experience of volunteers offering services for relief operations, different challenges are faced in coordinating relief activities. Moreover, prioritization of Humanitarian Supply Chain (HSC) activities to disaster damages is another concern for organizations. Lastly, while carrying out relief operations in certain calamities, HSC task recommendation to volunteers is also a significant problem. The authors propose an optimized volunteer task recommender based on the Systems Dynamics (SD) approach that improves the productivity of teams participating in relief operations. And they also consider a few parameters by the recommender to assess the expertise of the workforce. The results are promising enough with optimized task recommendations to resources in effective disaster management with potential for application in real-time situations.

The third chapter, titled Purpose Computation Oriented Modeling and Transformation on DIKW Architecture, points out that the DIKW models are increasingly acknowledged as an important approach to address the problems related to semantic understanding beyond various question and answering systems. However, there continues to be no unified understanding of the meaning of the DIKW concepts. Data, Information, Knowledge, and Wisdom as a whole concept of DIKW are also missing a cohesive understanding of the relationships among them. Thus, the third chapter, titled Purpose Computation Oriented Modeling and Transformation on DIKW Architecture, explores the internal relationships among resources, and constructs the resource processing model, and illustrates the specific transformation process of DDIK, IDIK, and PDIK with examples and diagrams.

The fourth chapter, titled Toward a Blockchain-Based Rural Supply Chain Management Platform for Targeted Poverty Alleviation in China, is about targeted poverty alleviation and supply chain management. In China, targeted poverty alleviation is a very important objective. By supporting farmers in producing their goods, most of the poor individuals have been lifted out of poverty. However, there are still some challenges that must be faced. The authors present insights into rural supply chain management development. A generalized blockchain-based supply chain management platform for targeted poverty alleviation is proposed. By taking advantage of blockchain, this platform can effectively help establish trust among participants, turn the supply chain into a trusted supply chain, and enhance the sustainability of poverty alleviation.

The fifth chapter, titled Centralised Quality of Experience and Service Framework Using PROMETHEE-II for Cloud Provider Selection, presents that all stakeholders need a centralized Quality of Experience (QoE) and Quality of Service (QoS) repository for enabling a sustainable trusted relationship, as well as forming practicable successful service level agreements (SLAs). Due to the elastic nature of a cloud and lack of proper resource management, the service provider is usually caught in service violation, leading to violation penalties both in terms of trust and money. Existing literature lacks studies on a centralized repository to assist cloud providers in resource management and cloud consumer service selection. To address the issue, the authors discuss the idea of a Centralised Quality of Experience and Service (CQoES) repository framework. The approach uses the PROMETHEE-II method where each alternative is assessed based on the consumer's custom weighted QoS attributes. The framework ensures the cloud marketplace's economic growth and helps the interacting parties build a durable and long-term trusted relationship.

The sixth chapter, titled Analysis of e-Consumer Behavior During the COVID-19 Pandemic, introduces the results of the initial phase of a study of changes in consumer behavior caused by the COVID-19 pandemic. The study aims to examine

specific changes in B2C interactions of Czech and Slovak consumers during the first lockdown in 2020. The starting point for changing consumer preferences is the fact that the dominant part of consumer interactions shifted from brick-and-mortar to virtual environments, where e-commerce is a safe alternative to traditional forms of trading. The results suggest that both the supply and demand sides of the market can adapt to the nonstandard situation in a relatively short time. From the point of view of customer behavior, an increase in B2C interactions is recorded in both monitored markets. The dominant part of the interactions shifts to the time of the standard working week; the weekend decline in interactions is significantly below the average on both sides of the market.

The topic of Intelligent Processing Practices and Tools of E-Commerce Data, Information and Knowledge is still a hot and emerging research. Thus, we wish these chapters can inspire blooming studies on the related topics of E-Commerce Data, Information, and Knowledge.

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