Introduction

Gayatri Pillai*

School of Informatics,
Universitat Politècnica de València,
Valencia 46022, Spain
Email: Gayatri.Pillai@protonmail.com
*Corresponding author

Dan Yu

School of Traffic and Transportation Engineering,
Changsha University of Science and Technology,
Changsha 410072, China
Email: b20160204222@stu.ccsu.edu.cn

Biographical notes: Gayatri Pillai received his PhD in Information Science from Universitat Politècnica de València in 2008. Currently, he is a Full Professor in School of Informatics, Universitat Politècnica de València. He research interests include computer science and information technology, VR and imaging processing.

Dan Yu received her PhD in Transportation Science from Changsha University of Science and Technology in 2011. Currently, she is a Full Professor in School of Traffic and Transportation Engineering, Changsha University of Science and Technology. Her research interests include traffic and transportation engineering, computer science and its application.

Logistics is a process in which goods flow from the place of supply to the place of receipt. According to the actual needs, the functions of transportation, storage, loading and unloading, packaging, circulation processing, distribution and information processing are organically combined to realise the user's requirements. Logistics management is to plan, organise, command, coordinate, control and supervise the logistics activities in accordance with the law of material flow and the basic principles and scientific methods of management in the process of social production, so as to achieve the best coordination and cooperation of all logistics activities, reduce logistics costs and improve logistics efficiency and economic benefits. Modern logistics management is based on system theory, information theory and cybernetics. The purpose of logistics is to meet certain economic, military and social requirements, and to achieve the goal by creating time value and place value.

Information technology is the general term of various technologies mainly used to manage and process information. It mainly applies computer science and communication technology to design, develop, install and implement information system and application software. It is also often called information and communications technology (ICT). It mainly includes sensor technology, computer and intelligent technology, communication technology and control technology.

Logistics management, including planning, organisation, command, coordination, control and other functions, is a complex system engineering. Logistics management information thoroughly improves the time-consuming and laborious situation of logistics management, and greatly improves the efficiency of logistics management. Through the establishment of logistics management information system, make the logistics plan more scientific and reasonable, more practical, and forward-looking. Logistics management information is one of the important contents of logistics information. Only with a good information processing and transmission system can the logistics system quickly and accurately obtain the sales feedback information and distribution goods tracking information, thus greatly improving the service level of logistics enterprises.

The primary objective of this Special issue is to provide a forum for researchers and practitioners to exchange their latest achievements and to further identify critical issues and challenges from academia and industry. Submissions are expected to provide innovative models, analytical explorations as well as advanced strategies. Topics include, but are not limited to, the following research areas:

1   modelling and verification for advanced logistic processes

2   key performance prognosis and forecasting

3   optimisation of logistics systems under competition

4   recent advances on control and monitoring technologies for logistic systems

5   advanced management strategies and industrial case studies.

Papers were selected using the following criteria:

1   Quality and originality in the theory and methodology.

2   Application-oriented papers exhibiting originality with reasonable theoretical.

3   Relevance to management of logistic system based on information technology.

4   Theory and engineering application prospect focusing on logistic system.

The seven papers that were eventually selected represent and characterise the outstanding and active studies in the area of control and management of logistic systems based on information technology by researchers in China, and illustrates clearly the advantages of developing information logistic management.

In the first paper, Rongting Sun and Yiqun Guo propose a big data forecasting method for traffic logistics demand based on regional differences. The BP fuzzy decision classification model is adopted for feature information clustering and information fusion processing of traffic logistics demand big data to optimise the big data prediction model. The simulation results show that the model has higher accuracy and better global convergence in the big data forecast of traffic logistics demand.

In the second paper, aiming at the shortcomings of current regional spatial logistics, such as low efficiency of logistics resource utilisation, high cost of logistics transportation and slow speed of goods transportation, a regional spatial logistics information integration method based on large data is proposed. The integration of regional spatial logistics information is realised by using the logistics transportation route optimisation model with time windows. The experimental results show that the proposed

regional spatial logistics information integration method can improve the utilisation efficiency of logistics resources.

In the third paper, aiming at the problems of low recall rate and low precision of intelligent classification of logistics multi-distribution resources, an intelligent classification method of logistics multi-distribution resources based on information fusion is proposed. The state error of multi-distribution vehicles is used to realise the intelligent classification of logistics multi-distribution resources. The experimental results show that this method has high recall rate and accuracy in intelligent classification of logistics multi-distribution resources, and can get more accurate classification results.

In the fourth paper, Zhongmin Liu and Jia Lyu provide a logistics distribution vehicle routing optimisation algorithm based on cloud model. According to label data and model training results set manually, the road condition of logistics distribution route is predicted. Combined with genetic algorithm and cloud model theory, the real-time solution and update of time-sharing weights of time-sharing weighted network paths are realised, and the global optimal solution is obtained. The experimental results show that compared with the existing algorithms, the efficiency of logistics distribution is more high.

In the fifth paper, Wenlian Deng and Aida Maki present a logistics transportation monitoring system based on GPS/DR integrated positioning technology. According to the actual needs of logistics transportation monitoring, the overall framework of the system is designed. The experimental results show that the system has high positioning accuracy, high actual load rate, low transportation cost and high reliability.

In the sixth paper, a logistics operation management algorithm based on hybrid intelligent optimisation algorithm is proposed. Based on the establishment of the optimisation model and its constraints, the initial solution of the model was obtained by artificial fish swarm algorithm in the early stage, and the updating strategy of ant pheromone concentration was selected to improve the transition probability of ant state. In the later stage, the concept of crowding degree is introduced to improve the basic ant colony algorithm and improve the ability of ant colony optimisation. The optimal solution is obtained by analysing the parameters that affect the performance. The experiment results verified the effective of the new method.

In the seventh paper, an integrated planning method for emergency logistics warehouse configuration is proposed. The multi-objective equilibrium programming model of enterprise emergency logistics warehouse allocation is solved by genetic algorithm, and the optimal planning strategy to realise the integration of enterprise emergency logistics warehouse allocation is obtained. The experimental results show that this method can improve service level, reduce transportation cost and improve transportation efficiency.

We very much hope that readers of this special issue will find the ideas presented in it of interest to them. We also hope that the material will be sufficiently stimulating to encourage many readers to explore advance logistic management based on information technology. This special issue is directed toward practicing engineers, researchers and industry operations managers, who wish to enhance or deepen their knowledge on logistic management based on information technology.

Acknowledgements