Literature survey

Paper Name: Parallel Control and Management for Intelligent

Transportation Systems: Concepts,

Architectures, and Applications

Author: Fei-Yue Wang, *Fellow, IEEE.*

Paper Explanation: ***Abstract*—Parallel control and management have been proposed**

**as a new mechanism for conducting operations of complex**

**systems, especially those that involved complexity issues of**

**both engineering and social dimensions, such as transportation**

**systems. This paper presents an overview of the background,**

**concepts, basic methods, major issues, and current applications of**

**Parallel transportation Management Systems (PtMS). In essence,**

**parallel control and management is a data-driven approach for**

**modeling, analysis, and decision-making that considers both the**

**engineering and social complexity in its processes. The developments**

**and applications described here clearly indicate that PtMS**

**is effective for use in networked complex traffic systems and is**

**closely related to emerging technologies in cloud computing, social**

**computing, and cyberphysical–social systems. A description of**

**PtMS system architectures, processes, and components, including**

**OTS*t*, Dyna*CAS*, *a*DAPTS, *i*TOP, and TransWorld is presented**

**and discussed. Finally, the experiments and examples of real-world**

**applications are illustrated and analyzed.**

Paper Name: Intelligent freight-transportation systems: Assessment

and the contribution of operations research

Author: Teodor Gabriel Crainic a,\*, Michel Gendreau b, Jean-Yves Potvin b

Paper Explanation—. While it is certainly too early to make a definitive assessment of the effectiveness of Intelligent

Transportation Systems (ITS), it is not to take stock of what has been achieved and to

think about what could be achieved in the near future. In our opinion, ITS developments

have been up to now largely hardware-driven and have led to the introduction of many

sophisticated technologies in the transportation arena, while the development of the software

component of ITS, models and decision-support systems in particular, is lagging

behind. To reach the full potential of ITS, one must thus address the challenge of making

the most intelligent usage possible of the hardware that is being deployed and the huge

wealth of data it provides. We believe that transportation planning and management disciplines,

operations research in particular, have a key role to play with respect to this challenge.

The paper focuses on Freight ITS: Commercial Vehicle Operations and Advanced

Fleet Management Systems, City Logistics, and electronic business. The paper reviews main

issues, technological challenges, and achievements, and illustrates how the introduction of

better operations research-based decision-support software could very significantly

improve the ultimate performance of Freight ITS.

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Paper Name: Intelligent logistics: Involving the customer

Author: Duncan McFarlane \*, Vaggelis Giannikas, Wenrong Lu

Paper Explanation— The role of logistics in effective supply chain management is increasingly critical, and researchers and practitioners have recently focused their attention in designing more intelligent systems to address today’s challenges. In this paper, we focus on one such challenge concerning improving the role of the customer in logistics operations. In particular, we identify specific developments in the systems governing core logistics operations, which will enhance the customer experience. This paper proposes a conceptual model for customer orientation in intelligent logistics and describes a number of specific developments the authors are involved in.

Paper Name: Data-Driven Intelligent Transportation Systems:

A Survey

Author: Junping Zhang, *Member, IEEE*, Fei-Yue Wang, *Fellow, IEEE*, Kunfeng Wang,

Wei-Hua Lin, Xin Xu, and Cheng Chen

Paper Explanation: **For the last two decades, intelligent transportation**

**systems (ITS) have emerged as an efficient way of improving the**

**performance of transportation systems, enhancing travel security,**

**and providing more choices to travelers. A significant change in**

**ITS in recent years is that much more data are collected from**

**a variety of sources and can be processed into various forms for**

**different stakeholders. The availability of a large amount of data**

**can potentially lead to a revolution in ITS development, changing**

**an ITS from a conventional technology-driven system into a more**

**powerful multifunctional data-driven intelligent transportation**

**system (D2ITS): a system that is vision, multisource, and learning**

**algorithm driven to optimize its performance. Furthermore,**

**D2ITS is trending to become a privacy-aware people-centric more**

**intelligent system. In this paper, we provide a survey on the**

**development of D2ITS, discussing the functionality of its key**

**components and some deployment issues associated with D2ITS.**

**Future research directions for the development of D2ITS is also**

**presented**

Paper Name: A Decomposition Approach for the Inventory-Routing

Problem

Author: Ann Melissa Campbell, Martin W. P. Savelsbergh

Paper Explanation— In this paper, we present a solution approach for the inventory-routing problem. The inventory-routing problem

is a variation of the vehicle-routing problem that arises in situations where a vendor has the ability to

make decisions about the timing and sizing of deliveries, as well as the routing, with the restriction that customers

are not allowed to run out of product. We develop a two-phase approach based on decomposing the set

of decisions: A delivery schedule is created first, followed by the construction of a set of delivery routes. The

first phase utilizes integer programming, whereas the second phase employs routing and scheduling heuristics.

Our focus is on creating a solution methodology appropriate for large-scale real-life instances. Computational

experiments demonstrating the effectiveness of our approach are presented.

scenario we consider concerns a plant that produces a number of

products over time and maintains an inventory of finished goods at the plant. The products are

distributed by a fleet of trucks to a number of retail outlets at which the demand for each product is

known for every period of a planning horizon. We compare two approaches to managing this operation,

one in which the production scheduling and vehicle routing problems are solved separately, and another

in which they are coordinated within a single model. The two approaches are applied to 132 distinct test

cases with different values of the basic model parameters, which include the length of the planning

horizon, the number of products and retail outlets, and the cost of setups, inventory holding and vehicle

travel. The reduction in total operating cost from coordination ranged from 3% to 20%. These results

indicate the conditions under which companies should consider the organizational changes necessary to

distribution planning. The particular scenario we consider concerns a plant that produces a number of

products over time and maintains an inventory of finished goods at the plant. The products are

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