BOOK REVIEW
Web-Based Supply Chain Management and Digital Signal Processing: Methods for Effective Information Administration and Transmission

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Information systems are key elements of most organizations. There is an inherent risk, though, that these information systems, if not adequately developed, tested, and implemented based on user requirements, would result in operating errors and/or inefficiencies (Simchi-Levi, Kaminsky, & Simchi-Levi, 2008; Wang, 2008a). The information required to maintain a successful supply chain is the core of the supply chain management. Facilitating the transformation process from data to information to knowledge is a paramount issue for every organization. Many companies are being flooded with data and volumes of conflicting information, but with limited real usable knowledge. However, rarely should a process be looked at from limited angles or in parts (Wang, 2008b).

The book consists of six sections and 21 chapters. The first section with an introductory chapter introduced the web based supply chain and explored the usage of related technologies for information supply chain management. The requirements from supply chain components for information have changed dramatically in terms of time, quality and quantity. Advances in the web technologies and signal processing have resulted in their extensive usage.

The second section (Chapters 2-5) covered the advanced information technology. It highlighted the relevant and powerful concepts required for information supply chain. Chapter 2 provided feedback neural network model - a predictive model based on information feedback - for the information and gave the basics of information modeling and measurement. The value and demand for the information vary all along the information supply chain, posing a big challenge for every player.

Chapter 3 explained the syntax and semantics for information representation and proposed...
hierarchical organization for the data to provide meaning for different players along the supply chain. Ontology plays an important role in the interpretation of the information depending on the context. Chapter 4 made available the model of information system for successful sharing of information. It is basically a self-sustained framework involving the entire life cycle of the information with acquisition, processing, storage and retrieval. Various examples for information systems used in daily life, including World Wide Web, data mart, data warehouse etc., are demonstrated.

The information management with different players or agents, based on Chapter 5, includes supervising all the activities of the information system: acquiring information; organizing and storing information; developing information products and services; distributing information; and using information. The usage of web for information sharing has opened both opportunities and challenges. Also, it provided the various factors influencing a successful information system.

The third section (Chapters 6-9) explored acquisition and processing of the information. The data acquired have to be appropriately cleaned before being processed. Associated with the information is the metadata that has to provide adequate meaning and relevance for the information.

Chapter 6 supplied the technology behind the acquisition of information and the usage of signal processing algorithms and outlined the different data rendering methods. The usage of internet has broaden the possible channels to collect the information from a variety of sources at different physical locations which otherwise is impossible. To make the interaction highly effective, the interface has to be specially designed. Chapter 7 elucidated the different techniques for data cleansing and processing since poor quality of data results in business losses that keep increasing down the supply chain. The end customer finds noisy, under or over sampled or distorted data absolutely useless and misleading. Quality constraints are imposed on the cleanliness of the data to make sure that it meets the industry standards. Some of the useful transformations required in the industry are Fourier transform, averaging, curve fitting etc.

Chapter 8 gave details on the various compression techniques. The concepts of compression are derived from Shannon's information theory and coding. The information acquired from the sources would have some redundancies. By removing these redundancies, it would be possible to store the data effectively with minimum space. Chapter 9 revealed how metadata describes information and showed the different metadata schemes. Metadata is the information about the information. It binds the data with the meaning. In addition, the author provided the framework for service description and message exchange in web services and introduced hierarchical representation of data abstraction to cater for the services.

The fourth section (Chapters 10-13) emphasized storage of the information and explained archival mechanisms. The stored data need to be maintained with security. The security and rights concepts are fused while storing the data.

Chapter 10 presented a framework for the interoperability of the data from different sources. The data integration is required at various levels by means of different algorithms. The data along the supply chain would be organized in different levels of hierarchy and at various levels of abstraction. Also, the chapter discussed the service oriented protocol and its impact on the data integration. Chapter 11 dealt with the storage mechanisms being practiced in various enterprises and introduced hierarchical data representation. Planning is required for the storage and subsequent utilization of the data. Examples of the data warehouse and data mart are provided. The mechanism to handle the heterogeneous data has been explained.

Chapter 12 addressed the archival of the information and discussed the various standards and mechanisms existing for digital archiving since backup and archiving are the important activities in any enterprise. Certainly, one of
the major issues with the data archives is the access time. Chapter 13 endowed with the access and security mechanisms associated with the stored data and introduced the hierarchical representation of data, map on to the different degrees of permissions. It discussed the different rights management standards and the rights are fused as a part of the content creation.

The fifth part (Chapters 14-18) focused on the retrieval of the information. As one moves from data to information and information to knowledge there is a change in the abstraction and visibility of the things. The assistance of intelligent elements is paramount for the usage of this huge knowledge base. Knowledge management addresses all these issues including acquisition, interpretation, deployment and searching of the knowledge.

Chapter 14 handled the data retrieval techniques and standards, provided good input for the search engines, and discussed various algorithms including parallelization of search and fusion of the results for the searching of the data. Chapter 15 clarified the clustering and classifier algorithms along with the decision process to merge the results. It showed how machine intelligence can be used to identify the patterns hidden in the data.

Chapter 16 introduced machine intelligence based on some learning rules in order to help the customer consolidate the acquired knowledge from the different sources, interpret and use valuable knowledge. It gave an overview of a knowledge based system towards providing the required information for the end user. Chapter 17 explained how the data are to be filtered out to extract useful information. Among others, artificial neural networks are extremely useful in learning the known patterns in the data and start giving inferences when they are provided with unknown patterns. The knowledge management includes effective acquisition, processing, storage, retrieval and decimation of the knowledge. Chapter 18 introduced the paradigm of knowledge management and provided the different web based techniques for knowledge management. Knowledge based systems provide the required expertise for the end customers to interpret the data and aid in the retrieval of the required information.

The last part (Chapters 19-21) emphasized effective and secure means for the transmission. The enterprises require the right time data rather than the real time data. The data transmission has to adhere to the agreed quality of service. Adequate security measures are to be in place during the transmission of the data.

The transfer of live data over the supply chain is challenging especially for multimedia data. Chapter 19 initiated hierarchical data representation towards data streaming and better performance. The streamed data may be decoded and displayed on the fly without waiting for the entire data to be transferred, a way much better over the other data transfers such as FTP. Chapter 20 afforded the mechanism for shaping of traffic flows towards sharing the existing infrastructure in order to avoid flooding of resources, the wastage of time and loss of data. Most of the applications around the customer require real time data transfer over the web to enable right decisions. For secure transmission of the data, Chapter 21 discussed the different data encryption standards and provided suggestions to speed up the process so that timing constraints of the service quality are met.

Having the latest and complete information with examples and case studies, this book is excellent reading for any professional interested in web-based supply chain management and digital signal processing. However, a few typos should be corrected for the second edition.

REFERENCES


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