

# Panel Supply Chain Collaboration Using a Web-Based Decision Support System to Improve Product Quality and On-Time Delivery

Ping-Yu Chang, *Department of Industrial Engineering and Management, Ming Chi University of Technology, New Taipei City, Taiwan,*

---

## ABSTRACT

*To address rapid change in the environment, enterprises increase their competitiveness through supply chain collaboration to efficiently allocate resources. However, supply chain collaboration usually fails because information is usually confidential, and many resources have to be devoted to leverage different business ideas and information systems. Although many studies have discussed strategies of supply chain collaboration, only a few of the strategies can be implemented in practice. Therefore, this research builds an information exchange platform to permit production and inventory information to be shared and analyzed online to ensure on-time delivery. This platform is implemented in a panel manufacturing company to establish the usefulness of the strategies and the constructed system. After implementing the system, on-time delivery increases 10% and quality increases more than 2%. This result demonstrates the usefulness of the proposed system in practice and strengthens the value of this research.*

*Keywords:* On-Time Delivery, Panel, Supplier Management, Supply Chain Collaboration

---

## INTRODUCTION

With the ongoing rapid changes (high product variety, customization, and the bullwhip effect) in the manufacturing environment, supply chains have faced on-time delivery and material quality control uncertainties. These uncertainties result from poor management of information

from suppliers, manufacturers, and customers. For instance, suppliers promise on-time delivery of components but usually fail to meet promised due dates because of uncertainties within their production line. A delay caused by suppliers will affect manufacturers' production schedules, increasing production lead times and the possibility of late delivery. To reduce uncertain-

DOI: 10.4018/ijec.2014040103

ties, sharing information within supply chain echelons to improve production efficiency, product quality, and managerial ability becomes a pertinent strategy for enterprises to enhance their competitiveness. Furthermore, it is necessary to build a platform to integrate information from different echelons and accurately transfer such information to manufacturers or suppliers to reduce lead time variance and improve on-time delivery. Although the impact of using a web-based platform to share supply chain information has been thoroughly discussed in the literature (Fedorowicz et al., 2008; Cassivi et al., 2008; Pick et al., 2009; Arinze, 2012), its effectiveness in a practical implementation has not yet been demonstrated.

Therefore, this study develops a web-based information platform based on the opinions of industry supply chain management experts. In addition, this study analyzes the required information and parameters to improve suppliers' probability of on-time delivery and manufacturers' production scheduling. The construction of this platform can reduce capacity loss due to the delay of suppliers, and improve efficiency to guarantee on-time delivery. Moreover, this study conducts surveys in a panel manufacturing company to determine the required standard and information for the platform. The platform is implemented in the same panel manufacturing company to understand its usefulness and the effect on the supply chain. This study is expected to achieve the following objectives:

1. Identify information required to integrate supply chain echelons. With information sharing through the platform, more efficient scheduling and on-time delivery can be achieved;
2. Apply multipliers to due date quoting formulas to improve due date prediction. The multipliers are based on empirical data.

The reminder of this paper is presented as follows. In Literature Review Section, a review of literature pertinent to the problem under study is presented. Information Platform Structure Section discusses the platform structure in

detail. Empirical Study Section presents the empirical study and the results obtained from the panel manufacturing company. In Implementation of the Concept Section, the implementation steps of the platform are presented. Finally, we present our conclusions in Conclusion Section.

## LITERATURE REVIEW

Supply chain management (SCM) was first introduced by Oliver and Webber (1982). The purpose of SCM is to identify and integrate the resources and procedures of different companies in a supply chain. The integration enhances the efficiency of the supply chain that is achieved with information and profit sharing. The Supply Chain Council (SCC) defines SCM as encompassing the planning and management of all activities involved in sourcing and procurement, conversion, and all logistics management activities. SCM also includes coordination and collaboration with partners, which can be suppliers, intermediaries, third party service providers, and customers. The development of SCM can be categorized into four stages: creation, beginning, developing, and mature and implementing. In the creation stage, SCM can only be called "business chain" management because all the managerial activities are performed for production. MRP (Material Requirement Planning) and MRPII (Material Requirement Planning II) are adopted to control business processes, but information sharing among companies is not integrated in this stage.

In the beginning stage, a basic SCM model is developed. Businesses change their focus from production to efficiency. In the developing stage, SCM has been fully implemented and investigated. TQC (total quality control) is adopted to improve product quality. Although production and efficiency are still key indexes for companies, throughput rate becomes less important than market trends and consumers' requirements. Hence, businesses have changed their focus from production to SCM activities in the product life cycle. In addition, the impact of improving relationships with suppliers and

13 more pages are available in the full version of this document, which may be purchased using the "Add to Cart" button on the product's webpage:

[www.igi-global.com/article/panel-supply-chain-collaboration-using-a-web-based-decision-support-system-to-improve-product-quality-and-on-time-delivery/114172?camid=4v1](http://www.igi-global.com/article/panel-supply-chain-collaboration-using-a-web-based-decision-support-system-to-improve-product-quality-and-on-time-delivery/114172?camid=4v1)

This title is available in InfoSci-Journals, InfoSci-Journal Disciplines Communications and Social Science, InfoSci-Select, InfoSci-Select, InfoSci-Communications, Online Engagement, and Media eJournal Collection, InfoSci-Journal Disciplines Business, Administration, and Management.

Recommend this product to your librarian:

[www.igi-global.com/e-resources/library-recommendation/?id=2](http://www.igi-global.com/e-resources/library-recommendation/?id=2)

## Related Content

---

Impact of Trust and Technology on Interprofessional Collaboration in Healthcare Settings: An Empirical Analysis

Ramaraj Palanisamy, Nazim Taskin and Jacques Verville (2017). *International Journal of e-Collaboration* (pp. 10-44).

[www.igi-global.com/article/impact-of-trust-and-technology-on-interprofessional-collaboration-in-healthcare-settings/182738?camid=4v1a](http://www.igi-global.com/article/impact-of-trust-and-technology-on-interprofessional-collaboration-in-healthcare-settings/182738?camid=4v1a)

Mapping the Need for Mobile Collaboration Technologies: A Fit Perspective

Saonee Sarker, Damon E. Campbell, Jan Ondrus and Joseph S. Valacich (2010). *International Journal of e-Collaboration* (pp. 32-53).

[www.igi-global.com/article/mapping-need-mobile-collaboration-technologies/46979?camid=4v1a](http://www.igi-global.com/article/mapping-need-mobile-collaboration-technologies/46979?camid=4v1a)

## Creativity Support via Terms in Thematic Relations

Eiko Yamamoto and Hitoshi Isahara (2010). *Interdisciplinary Perspectives on E-Collaboration: Emerging Trends and Applications* (pp. 117-129).

[www.igi-global.com/chapter/creativity-support-via-terms-thematic/41546?camid=4v1a](http://www.igi-global.com/chapter/creativity-support-via-terms-thematic/41546?camid=4v1a)

## Virtual Teams Demystified: An Integrative Framework for Understanding Virtual Teams

Olivier Caya, Mark Mortensen and Alain Pinsonneault (2013). *International Journal of e-Collaboration* (pp. 1-33).

[www.igi-global.com/article/virtual-teams-demystified/77844?camid=4v1a](http://www.igi-global.com/article/virtual-teams-demystified/77844?camid=4v1a)