

Digital Supply Chain Management and Implementation: A Research Review

Binshan Lin

College of Business Administration
Louisiana State University in Shreveport
One University Place
Shreveport, LA 71115
Phone: 318.797.5383 Fax: 318.797.5176
Binshan.Lin@LSUS.edu

Charlotte A. Jones

College of Business Administration
Louisiana State University in Shreveport
One University Place
Shreveport, LA 71115
Phone: 318.797.5383 Fax: 318.797.5176
Charlotte.Jones@LSUS.edu

ABSTRACT

The premise of this paper is that the effectiveness of the digital supply chain in contributing to industry will be a function of web-model alignment and the appropriateness of the process to a particular supply chain situation. We begin with a discussion of the most commonly advocated digital supply chain models and processes. Then we review the research evidence on digital supply chain management and strategy in the industry. Finally, future research directions are discussed as well.

Keywords: Digital Supply Chain, Supply Chain Management, Project Management, Quality Management, Environmental Management, Order Management

INTRODUCTION

An emerging trend in supply chain worldwide is a movement of the focus from that of supply chain to that of digital supply chain. Examples of this trend are evident in various industries including music, publishing, video, and library industries. The supply chain concept is experiencing a fundamental paradigm shift in respect to the music industry (Graham, 2006). For example, by June 2008, digital music sales generated around \$2 billion in revenue, with tracks available through 500 online services located in 40 countries, representing around 10 percent of the total global music market (IBISWorld, 2008). The global music industry is dominated by the

“big five” major record companies. The advent of the Internet has a significant impact on both the supply chain for music and the dominance of the big record labels (Graham et al, 2004).

Digital supply chain encompasses the process of the delivery of digital media by electronic means from the point of origin (content provider) to the destination (consumer) (Whelage, 2008). Warehouses are being replaced with data centers, boxes replaced by bits, and trucks replaced by bandwidth. Within the digital supply chain, one can receive a digital item into inventory and then sell it a million times over a short time period without ever restocking. Vendors can be paid for each digital asset sold without having to stock inventory that may never move. Channel management shifts from conventional distribution to retailers to broadband providers, to online, and directly to the consumer.

Evidence suggests that investments in IT-based supply chain management systems are an important differentiator for companies (Tarantillis, Kiranoudis and Theodorakopoulos, 2008). Projects are most likely to provide financial benefits when they are well planned and executed. Companies such as Dell and Apple mastered the process, providing them with enormous competitive advantages in the marketplace. Companies that do not have good supply chain systems and processes often experience lower customer satisfaction levels, order lead times, and inefficient production processes versus those that do.

The premise of this paper is that the effectiveness of the digital supply chain in contributing to the industry will be a function of web-model alignment and the appropriateness of the process to a particular supply chain situation. We begin with a discussion of the most commonly advocated digital supply chain models and processes. Then we review the research evidence on digital supply chain management and strategy in the industry. Finally, future research directions are discussed.

DIGITAL SUPPLY CHAIN MODELS AND IMPACTS

One primary reason our example company undertook a digital supply chain project was to improve their business model and sell more products. New software would replace nearly one hundred legacy systems and would require an IT team in general. Several key individuals on the project steering committee were veterans of past projects and knew successful implementation required a systematic, well-planned approach.

The main process of a digital supply chain includes three major components: (1) true on-demand product availability, (2) ease of use and speed for content search and activation, and (3) pricing and subscriptions. There were three principal drivers behind the new process:

- Customers rated the company “below expectations” versus its competitors for distribution performance.
- Company management could achieve significant profit increases by reducing overhead expenses associated with existing systems.
- Quality management needs to focus on licensing and refunds policy.

A typical digital supply chain project should be divided into four phases: (1) identify the associated high-level processes, (2) define these processes in detail in order to gather business requirements for the purpose of configuring the company's technology to perform the processes, (3) determine organizational readiness, and (4) implement the digital supply chain.

These also include order management and environmental management. Benefits identified for the digital supply chain include a more customer-responsive ordering system, improved product availability, cost savings, and an integrated information system.

Five high-level activities support the order management process: (1) order creation, (2) risk and credit management, (3) collaboration compliance, (4) exception order management, and (5) billing and invoicing.

The shift to digital supply chain will significantly alter the industry lifecycle emissions profit over the coming years. These changes will result in the greater proportion of emissions coming from indirect sources, such as the energy used by servers hosting digital content and the embodied carbon in the materials of music listening devices. The industry could take a lead by being prepared and willing to participate, pre-regulation, in such proactive process.

CONCLUSION AND FUTURE RESEARCH CHALLENGES

Because digital supply chain research is relatively new, numerous challenges remain in the area of improvements to business and industry, many of which require effort from IT researchers interested in operations management environments. Research is needed in several areas:

Organizational Readiness. The following questions suggest some possible indicators of organizational readiness for digital supply chain implementation:

- Is there an understanding of the need for and implications of digital supply value chain within the impacted organizations?
- Is the digital supply chain a priority for the business unit?
- Does the case for change create a sense of urgency?
- Is the proposed project staffed with the appropriate resources?
- Does the organization have future processes defined?
- Do recognition and reward systems to motivate the actions, behaviors, and work practices exist to promote success?
- Are resources diluted by multiple initiatives that deter their ability to execute effectively?
- To what degree do the knowledge and skills already exist to effectively enter, extract, analyze, and use information to improve business performance?

Interaction between supply chain integration and digital content. It seems quite common that the interaction between supply chain supply chain integration and supply chain networks in the physical supply chain setting may differ in the digital content value chains. It is also quite possible that the interaction between vertical integration and digital content may differ from the interaction between horizontal integration and digital content. As many supply chain managers move beyond the recognition that they have strategic options, they recognize that they have a

managerial responsibility to understand what direction might be possible and to make choices that will enable their digital supply chain more effectively,

Success and failure factors of digital supply chain implementation. The following statements suggest possible reasons for successes and failures of digital supply chain implementation:

- The impacts of the new digital supply chain system on day-to-day operations should be well-estimated and understood.
- Management must assign the right people to the digital supply chain project *from the beginning*.
- Supply chain success is enhanced by supplier network design, information sharing, visibility, and proactive measurement and monitoring (Gulledge and Chavusholu, 2008).
- Process designs and full organizational buy-in should be complete prior to solution design.
- Cultural issues can get in the way, slowing decision-making.
- The future state of the organization must be well-defined, documented, and understood by employees.
- The team needs a strong commitment from software supplier and consultants.
- Redesigned, the supply chain process could allow distributors to order what they wanted and receive delivery of the same order.

REFERENCES

- Bottrill, C., Lye, G, Boykoff, M., and Liverman, D. *First Step UK Music Industry Greenhouse Gas Emissions for 2007*, Environmental Change Institute, 2008.
- Graham, G., Burnes, B., Lewis, G.J. and Langer, J. (2004) "The Transformation of the Music Industry Supply Chain: A Major Label Perspective," *International Journal of Operations & Production Management*, Vol. 24, No.11, pp.1087-1103.
- Gulledge, T. and Chavusholu, T. (2008) "Automating the Construction of Supply Chain Key Performance Indicators," *Industrial Management & Data Systems*, Vol. 108, No. 6, pp.750-774.
- IBISWorld, (2008) "The Tables Have Turned: Rock Stars – Not Record Labels – Cashing in on Digital Revolution," June 19, 2008
www.ibisworld.com/pressrelease/pressrelease.aspx?prid=127
- Tarantillis, C.D., Kiranoudis, C.T., and Theodorakopoulos, N.D. (2008) "A Web-based ERP System for Business Services and Supply Chain Management: Application to Real-World Process Scheduling," *European Journal of Operational Research*, Vol. 187, No. 3, pp.1310-1326.
- Wehlage, C.J. (2008) "How the Digital Supply Chain Made Apple No. 1 on the Supply Chain Top 25," *AMR Research*, July 28, 2008.