A case study for implementing a B2B collaborative information system: a textile case

Tien-Hsiang Chang
Department of Information Management,
National Kaohsiung University of Applied Sciences, Kaohsiung City, Taiwan

Hsin-Pin Fu
Department of Marketing and Distribution Management,
National Kaohsiung University of Applied Sciences, Kaohsiung City, Taiwan

Shao-Chang Li
Department of Business Administration, Kao Yuan University,
Lujhu Township, Taiwan, and

Hung-Hsuan Lee
Institute of Management,
National Kaohsiung First University of Science and Technology,
Kaohsiung City, Taiwan

Abstract
Purpose – The purpose of this paper is to discover strategic implications and successful factors leading to the development of an attractive model for other firms to follow based on a typical case study.

Design/methodology/approach – This paper used a case study methodology to examine the case of a business-to-business (B2B) collaborative information system based on the first textile company in Taiwan to implement a RosettaNet-like for B2B process integration.

Findings – The results showed that some key success factors included: support and understanding from the entire team, simple process redesign, standard process development, government support, distinctive operation collaboration model, total support from top management, and an effective and experienced team.

Practical implications – Managerial implications are as follows: employ vertical process integration to quickly exchange data, establish a platform to share information, establish vendor-managed inventory (VMI) to lower costs, and a cross-organization centre to effectively operate the platform.

Originality/value – The complete information structure provided in this case, the distinctive collaborative and the proposed implementation models can all serve as a reference for other enterprises whose size, scope and information technology level are similar to the focal firm in this case.

Keywords Textile industry, Taiwan, Information systems, Data handling

Paper type Research paper

1. Motivation
Sweeping changes brought on by the emergence of the internet and business-to-business (B2B) electronic commerce (EC) has significantly affected enterprise activities. Profit creation methods in this “virtual economy” tidal wave have become a shared concern
around the world. Businesses are increasingly proposing EC strategies (primarily internet-related) to lower costs, elevate efficiency, and strengthen relationships with partners and customers, in hopes of increasing their international competitiveness. The development of effective strategies for achieving competitive advantage through EC will be essential for success in the twenty-first century (Gunasekaran et al., 2002).

To enhance businesses competitiveness, the Australian Government recently funded the “Quick Response” program within the textiles, clothing, and footwear industry (Perry et al., 1999). Similarly, the Industrial Development Bureau (IDB), part of the Taiwanese Ministry of Economic Affairs, also initiated a “B2B Electronic-Commerce Promotion Program” (BECP) in 2000 that encouraged businesses to implement information systems to lower costs and enhance efficiency. The textile industry was listed as one of the key industries to be upgraded under the program (NICI, 2002).

Under the BECP, enterprises apply for funding to implement a B2B information system (B2BIS) by filing a proposal with the IDB, who then appoint a committee to review the proposal until the project is accomplished. Through the support of the BECP, Chia-Her (CH), a Taiwanese textile business, associated with its upstream and downstream partners to collectively implement a B2B collaborative information system. This case also concerns the first non-information technology (IT), non-semiconductor industry in Taiwan to implement a RosettaNet-like for B2B process integration, and the distinctive collaborative model that was employed is worthy of detailed discussion. Therefore, this paper, examines the case in detail, including the implementation procedures, difficulties, performance, strategy implications and critical successful factors. The author also interviewed the project leader and two committee members related to this project to gain a better understanding of the performance. Finally, the implemented B2BIS model is summarized to provide a reference for other enterprises whose size, scope and IT level are similar to that of CH.

2. Literature review
Businesses must invest in IT to remain competitive, and must become increasingly sophisticated in the marketplace if they are to survive in the long-term (Gunasekaran et al., 2001). A number of researchers have examined IT implementation through case studies.

Fu et al. (2004) devised a five steps information system implementation model through a review of the relevant literature and a corresponding case study. Fu et al. (2005) also proposed an implementation model for a wireless exhibition guide system according to the relevant literature associated with mobile commerce and a case study. Yusuf et al. (2004) examined key dimensions related to the implementation of an enterprise resource planning (ERP) system and identified via a case study methodology some core issues that can affect the successful implementation of an enterprise information system. Wu et al. (2006) proposed an IS implementation model after studying four SME cases regarding an implemented ERP system and conducting a literature review. Edwards (2007) employed a case study methodology to better understand the relationships between system usage, business process change, and system change. Lau et al. (2004), through a case study, proposed an infrastructure framework to support the design and implementation of a reverse logistics system.

In terms of a collaborative system aspect, Munkvold et al. (2006) presented an analysis of a collaborative decision-making process related to the selection and
implementation of a new corporate solution for collaboration and information management within a Norwegian oil company. Based on an in-depth case study, Bhandar et al. (2007) indicated that social capital can be leveraged as a motivator, an integrator, and a facilitator during the various stages of a collaborative IS project.

Based on the above literature review, we can see that most research focused on enterprise internal information systems, together with some recent discussion of collaborative system cases. We believe that case studies can lead to valuable findings and implications; therefore, this study also employed an exploratory case study as its research method.

3. Methodology

Experimental research, investigative research, historical research, archival record analyses and case studies are five common methods for social science research (Yin, 1994). Among these methods, when the problem being researched involves a large number of variables and the important issues relate to existing problems, then case studies offer a better approach (Yin, 1994). Gable (1994) compared the advantages and disadvantages of case study research, investigative research, and experimental research and found that case study research has a higher exploratory capability. Yin (1993) listed several specific examples related to education and management information systems along with the appropriate research design for each case. Moreover, Benbasat et al. (1987) concluded that three advantages exist to using case study research within the information management field:

1. the current situation can be understood in a natural and un-manipulated environment, and theories can be derived from actual observations;
2. it is easier to understand the essence and complexity of the process; and
3. facing rapid changes in terms of information management, it is easier to obtain new insights on the research topic using this method.

According to the aforementioned advantages, the case study method was appropriate for this study because centered on the implementation of a collaborative information system.

4. Case study

Two issues should be considered while employing a case study methodology. The first is whether the case is typical, and the other concerns the feasibility of the data collection. In this paper, the case was deemed to be typical because it is the first textile case in Taiwan to implement a RosettaNet-like for B2B process integration. Also the data collection was deemed feasible because the author was familiar with the project leader and two committee members related to this project, and was therefore able to interview these people to acquire more data and information. After reviewing the project final report (IDB, 2003) collected from the IDB project promotion office, the case study proceeded as follows.

4.1 Background of companies

The textile industry generates more foreign exchange for Taiwan than any other industry, with garment fabrics representing about 60 per cent of its export total (TTF, 2006).
ITT, CH, and I-Hwa (IH) are Taiwan’s biggest manufacturing groups of checkered fabrics, a special type of garment fabric:

- CH has a capitalization of TW$4,160 million and owns the largest design capacity, yarn dye capacity, and loom capacity for checkered greige in the world. Its research and development (R&D) department is the benchmark for the checkered greige industry in Taiwan.
- ITT (a customer of CH, and a member of the TAP group) has a capitalization of TW$230 million, and is one of the few garment manufacturers in Taiwan able to offer high wages and yet retain excellent results through sound management and electronic operations. It is an exemplary operation model for the industry.
- IH (CH’s contractor for dyeing and finishing) has a capitalization of TW$2,237 million. It holds the leading position in the world in checkered fabric dyeing and finishing capacity, and has the most stable production quality.

ITT’s partnership with CH and IH has already established a competitive quick-response system that has been in use for some time. The physical proximity of the three companies in terms of location has further consolidated their status as the world’s most competitive combination in checkered greige products. In an attempt to maintain their existing advantages while enhancing overall competitiveness in the modern environment of the “digital economy”, CH, IH, and ITT in combination with their partners have promoted a B2B collaborative information system.

4.2 Promotion procedures
The promotion procedures in this case can be divided to six stages and are described in the following sections.

4.2.1 Promotion organization and project management. To facilitate the execution of the project, it was necessary to establish a promotion organization as follows:

- **Steering committee.** Committee members included CH’s general manager and the relevant department heads (top management) of the three companies. The committee’s main task was to plan and analyze the strategy and business model, to plan the operation model, and to set-up complementary measures for the promotion – while supervising and reviewing project progress and results at regular intervals.
- **Promotion team.** This team included IT and senior staff from the relevant departments of the three companies and important suppliers – including those responsible for data collection, internal and external process analysis, system implementation, and training planning.
- **Software and consultant team.** This team assisted the interface integration, conducted As-Is model analysis, planned the To-Be model, and constructed a B2B platform.

4.2.2 Strategy analysis and planning. The strategic goal of the three companies was to strengthen their marketing, R&D, and operation management capabilities to achieve greater profits, and enlarge market share through a collaborative information system. Ultimately, they hoped to become an international supply centre of fashionable fabrics and garments – hence, the choice of “eFashion” as the title of the project.
In order to improve the value and competitiveness of the supply chain, the steering committee set up three short-term, mid-term, and long-term strategy goals: e-chain (short-term) established a quick response capability to eradicate errors, delays, and personnel costs caused by data transfers or miscommunications, e-community (mid-term) shared the relevant operational data with close partners, and e-collaboration (long-term) became a “virtual total solution provider” of fashion and garments.

4.2.3 As-Is model analysis. The functions of a textile product demand chain (Figure 1) can be divided into five main stages, the:

1. sourcing/fabrication stage where designers search for ideas and decide on ideas, and manufacturers develop relevant products on their own;
2. hand-loom stage where fabric or garment manufacturers produce sample fabric or garments according to customer specifications;
3. trial-weaving stage that allows small quantity productions for designer display;
4. order stage where retail sales have been confirmed by orders; and
5. reorder stage after positive market reaction.

To implement the strategy and business model drawn up by the steering committee, the promotion team subsequently began planning a series of activities to fit in with the strategic goal. The implementation of IT should begin by considering the existing operational process and organizational structure, and then redesigning the process from an IT perspective (in what is known as BPR) to achieve process integration. Therefore, the promotion team first needed to know more about the existing process and problems as related to:

- **Sourcing/fabrication.** All ideas and R&D data came from individual businesses (ex. source yarn, dye, dyeing and finishing, weaving and garment) and designers. The fabric, dyeing and finishing (IH) suppliers delivered the product data they developed in paper form to CH, following which CH and the garment manufacturer (ITT) sent actual samples to designers to facilitate the designing of fashionable garments.

- **Hand loom.** During the hand-loom stage, the designers and garment manufacturer (ITT) couriered actual fabric samples or drawings to CH, asking for an exact hand loom. CH produced the hand loom using the quickest process and couriered it to the designers and garment manufacturer (ITT). Necessary corrections (colour, density, etc.) were communicated by fax. CH also faxed source fabric orders to suppliers during this stage.

- **Trial weaving.** The designer or garment manufacturer (ITT) placed trial-weaving orders with CH by fax. Following this, CH sent notification to the dyeing and finishing factory (IH) via e-mail for greige, after which the factory delivered the finished cloth directly to the garment manufacturer (ITT) for the production of a sample garment. Meanwhile, the dyeing and finishing factory (IH) sent delivery

![Figure 1.](Image)

**Textile product demand chain**

**Note:** Textile Product Demand Chain
documents (packing list, test reports, etc.) in paper form to CH for the latter to courier to the garment manufacturer (ITT).

- **Order/reorder.** The designer or garment manufacturer (ITT) placed orders with CH via e-mail. CH, together with the dyeing and finishing factory (IH), performed the same procedures as in the trial-weaving stage, after receiving the orders. After the product was received by the market positively, and the brand company had placed reorders with the garment manufacturer (ITT) through EDI, the reorder process was identical to the order process.

### 4.2.4 Problems

After analyzing the above As-Is model, the key problems regarding the current operation process between CH and its partners could be ascertained (Table I). Because each company had its own information department, as well as different data transfer methods, formats and databases, a lot of manpower and time was required for data delivery and transfer, organization, and maintenance. This wasted both time and labour, and proved extremely inefficient. In addition, because most R&D and design data were still in paper form, they were difficult to maintain, and could not be effectively used to create an index for future references.

#### 4.2.5 To-Be model

To solve the problems listed in Table I, the promotion team redesigned the appropriate operational process from customer to supplier according to an IT perspective, and built an integrated platform for a B2B collaborative information system. This platform included an e-vendor-managed inventory (VMI), e-production, and an e-library, all integrated on one platform. The system structure and functions of the platform are shown in Figure 2 and Table II, and the access modes and categories of partners are shown on Table III.

In this platform, the e-VMI system provided access to suppliers and integrated the inventory inquiries, inventory management, and replenishment processes for each party. The e-production accessed partners and customers, performing the electronic functions related to database enquiries, invoice enquiries, order management, and user feedback.

<table>
<thead>
<tr>
<th>With partners</th>
<th>With customers</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Order/reorder</strong></td>
<td>Able to share product data</td>
</tr>
<tr>
<td>Poor delivery of R&amp;D data; unable to share product quality data</td>
<td>Incompatibility of document formats; redundant document production</td>
</tr>
<tr>
<td><strong>Trial weaving</strong></td>
<td>Lack of key fabric alert mechanism</td>
</tr>
<tr>
<td><strong>Hand loom</strong></td>
<td>Errors tended to occur in the manual copying of project data, increasing the time and manpower needed</td>
</tr>
<tr>
<td>Lack of sample fabric bank hindered the reduction of hand-loom time</td>
<td></td>
</tr>
<tr>
<td><strong>Sourcing/fabrication</strong></td>
<td>Businesses in the supply chain were unable to share relevant product data</td>
</tr>
<tr>
<td>Each business individually developed product; transfers of the R&amp;D data in paper form wasted time</td>
<td></td>
</tr>
</tbody>
</table>

Table I. Problems related to the As-Is model
The e-library was intended to be an integrated, shared database for the whole supply chain. Once the three modules were integrated on the B2B platform, they effectively solved the existing problems related to R&D and database creation resulting from incompatible data formats and different modes of data access. Also, because the B2B
Can a better analysis tool (aside from a case study) be used to analyse such case, such as the computer-aided software engineering (CASE) tool? It may lead to different results.

The proposed model can be applied to other industries to see whether it has faults. If so, then modification of this model may be undertaken to make it more complete.

References
Further reading


Corresponding author

Hsin-Pin Fu can be contacted at: hpfu@ccms.nkfust.edu.tw