Supply-Chain-based e-Business for Small Medium Enterprise

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Abstract. A home business is a part of the small medium enterprises (SMEs). It is commonly unmindful that it has a practical formal supply chain. A home business can achieve much more benefit and create a mutually beneficial relationship (win-win solution) by implementing the supply chain conception into its business process. Moreover, by utilizing the internet as a communication network facility, a home business can take the advantages of supply chain integration. In this study, one novel concept developed. It is called as a supply chain-based e-business that applied in the home business, especially in doing apparel products. Based on conceptual-oriented and design-oriented methods by being dominated with literature study, the concept was systematically constructed. The research process to combine the supply chain competencies, development aspects of supply chain-based technology, and supply chain integration was performed. It was applied in developing such an applicable concept. Finally, the proposed concept is able to be possibly implemented in every home business in doing its business activities. On the other hand, the proposed concept can academically enrich the e-business conception.

Keywords: e-business, supply chain, small medium enterprises, home business, applicable concept

1. Introduction

Supply chain is a model portraying the flow of materials, information, money, and services from raw material suppliers through factories to the end customers (Turban et al. 2004). Naturally, every kind of business or enterprise must have a tightly connection to the supply chain. However, based on the Quayle's research, mostly small medium enterprises (SMEs), include home business, overlook the supply chain aspect, even supply chain management is not addressed in the newest business plan as well, so SMEs usually do not have a formal supply chain (McDowell et al. 2010) in doing their business process realistically.

Those conditions show that SMEs, especially home business, are still working alone and do not have any collaboration yet with their supply chain entities. Whereas, the conception of supply chain can increase their benefit and optimize their business process. For example, a home business can cooperate with the entire integrated supply chain entities and naturally reach win-win relationship.

Furthermore, supply chain management (SCM) is a very essential function for SMEs and a positive impact normally for a small business (Gélinas and Bigras, 2004; Nelson and Ratliff, 2005; Morrissey and Pittaway, 2006; Redondo and Fierro, 2007). Each integrated partner, via internet technology, can share data (and information) to collaborate to each other, reach win-win condition for all members, expand the business network, decrease product life cycle and cost expense, and increase productivity, income, and market visibility (Mentzer et al. 2000; Zaremba et al. 2003; Ross, 2011; Zhou, 2011). The internet infrastructure can be technically installed with few investments. One of several applications that adopts internet as their application platform is electronic business (e-business). An e-business has a strong influence in relationship among supply chain partners (Zhou, 2011).

By combining the benefits and advantages of e-business and supply chain management that have been mentioned above, SMEs (especially home business) can gain a competitive advantage in the market. In this paper, authors mention a development of a concept of supply chain-based e-business for a home business that creating a mutually beneficial business relationship for the partners involved in the supply chain as an alternate business way, especially in product delivery and service aspect. The academic contribution offered is an innovative conception for implementing the supply chain management in SMEs that practically operated by home-business. We are going to explain detail all parts of related works, literature review, research methodology, results and decisions, and conclusion respectively.

2. Theoretical View

2.1. Home Business and E-Business

Home business is a business which the core activities are done at home. It uses home as daily business office and business activity center. Indeed, home business is a part of SMEs. The primary entities of home business structure are government agency, business association, supplier, client, and business partner (Sulaiman et al. 2009).

Moreover, an electronic business is the uses of the internet as a network and empower business processes, electronic commerce, organized communications, and collaborations with companies, consumers, suppliers, and other stakeholders. Several subsets of an e-business application are electronic commerce (e-commerce) and electronic procurement (e-procurement). E-commerce is buying and selling, marketing and service of products or services activities over computer networks (Combe, 2006). On the other hand, **e**-procurement is the electronic integration and management concept of all procurement activities, including purchase requests, entitlements, ordering, delivery, and payment between the buyer and the supplier (Chaffey, 2007).

2.2. Supply Chain Management

Win-win solution for several aspect is needed to conduct the business collaboration between two companies. Win-win means both parties (or several parties) get all desired proportionally. This is the best and ideal results (Goldwich, 2010). Win-win solution does not mean 50:50, but at least all partner members can enjoy better results and get benefits proportionally in their cooperation (Indrajit and Djokopranoto, 2003). To realize the solution, supply chain is implemented. Supply chain aims to connect supply linkages and functions of different entities, both inside and outside company, for raw materials, manufacture, sale, distribution, transportation, and warehousing who join as a large number of partner and customer (Zhou, 2011).

Supply chain competencies consist of several aspects. Some of them are customer management, supplier management, supply chain collaboration, and integrative technologies. To stay competitive, SME needs to achieve coordination and greater collaboration among the entire supply chain partners in an approach called supply chain integration (Lee and Whang, 2000). Supply chain integration includes coordination and collaboration among supply chain partners. Major force in the supply chain collaboration is to achieve a win-win solution for all participating members (Ross, 2011).

Additionally, the supply chain management (SCM) is the management philosophy to integrate network linkages upstream (source of supply), the internal relationships within the organization, and linkages downstream (distribution and major customers) to perform certain processes and activities that eventually will

create and optimize value of specialized products and services to satisfy customer demand (Hugo et al. 2004).

2.3. Technology-Driven Supply Chain Management

Technology-driven SCM is a management model that constructs and combines the individual companies become nodes in a network of supply chain, connected digitally, and collectively focus on the continuous evolution of new forms of customer value. Aspects of the development of technology-driven SCM, such as customer relationship management (CRM), partner relationship management (PRM), supply chain planning, supplier relationship management (SRM), and logistic resource management (LRM) (Ross, 2011).

Furthermore, the CRM is all the activities to identify, attract, retain customers, and focus on aligning the entire organization to build profitable and long relationships with customer. PRM is a management method and software technology to expand partner relationship and create a partnership more closely with partner, dealer, and reseller, to ensure each trade partner contributes to customer satisfaction (Ross, 2011).

Supply chain planning is appropriate supply chain strategies which match to the company's vision and business competence. SRM provides information for the purchasing division to obtain full transparency of transactions with suppliers, an accurate profile of the supplier base, identify opportunities for optimal procurement of materials, equipment, and services required. LRM is the process of manufacturers, distributors, and suppliers store and move products through the supply chain to the customer (Ross, 2011).

Recognize characteristic of the product is critical in determining the right supply chain strategy. The product can be categorized as functional and innovative product. Functional product is a product that can be predictable and stable over time so that the entire supply chain strategy oriented on efficiency. Examples are food and book. While innovative product has short product life cycle, unpredictable demand, high stock out, high obsolescence, and oriented in a responsive strategy to reduce lead time (Ambe and Badenhorst-Weiss, 2011). Examples are apparels and electronics.

3. Related Works

3.1. Literature Study

One of some previous research relates to this study is a research from [8]. They built a concept of integrated supply chain for SMEs based on the ebXML protocol architecture, and the web service. They called the model as a new approach in doing business in electronic atmosphere (internet). Lee and Han (2009) developed a framework of e-business impact to the supply chain integration. All concepts B2B cooperation, e-service integration, and also dynamic business roles were

academically investigated in detail. Meanwhile, Pawar and Plivela (2022) presented a new cyber-security framework implemented in SME. The framework operated to maintain the asset in SME that should be controlled well. Furthermore, Park and Kim (2022) studied deeply digital supply chain. They concluded that Grab has implemented supply chain strategy based on right service, right time, right quality, and right price.

Specifically, in this study, it aims to propose the original idea in realizing the supply chain management based on technology in e-business. The implementation is concerned on small-medium size home-business, particularly in business of the fashion products. The supply chain management itself combines three aspects; technology, competency, and win-win solution.

3.2. Study Limitation

All processes in the study were dominated via literature study. The empirical data is the study limitation. The data is going to enrich the constructed concept rationally. Furthermore, only three types of aspect that considered in the constructed concept configuration. Human and environment aspects were not taken into account. Thus, in considered aspect side is also the limitation of the study.

4. Research Methods

This research type is based on (Kothari and Garg, 2013) which called the conceptual-oriented research (also called push-oriented or goal-oriented research) and design-oriented research by (Verschuren and Hartog, 2005). This research related the development of an idea or theory. The data collection method was dominated by literature exploration. The research model of this study is conceptually shown by Fig. 1.

The idea coming from the deep literature study and observation; where, to develop a supply chain-based e-business on home business is the main idea. Then, the idea considered produces the goals to realize such a main idea. Goals also determined via deep literature study. Finally, three kinds of basic theory demanded in developing the final concept. They are theories of technology based SCM, supply chain competencies, and win-win solution. Textual theories were mentioned clearly in the third section of the paper.

5. Result and Discussion

The initial idea was to develop a supply chain-based e-business on SMEs (especially home business). It is expectedly able to create a win-win relationship for the supply chain partners. From the idea, we translated the goal of supply chain-based e-business then. This goal would later be used in formulating its concept. In general, its objective is to obtain the benefits and advantages of e-business, supply

chain management, and supply chain integration as an approach to obtain a win-win solution among supply chain partners. The paraphrase is outlined in Table 1.
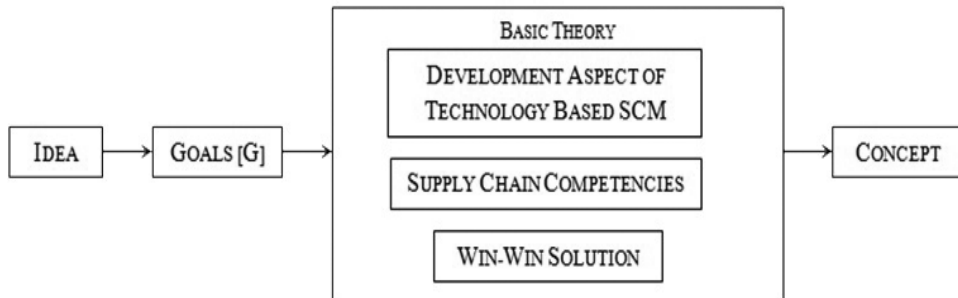

Fig. 1: Research model

Table 1: Goal of supply chain based e-business

Goal Code	Goal Description
G1	To build electronic relationships with all partners and adjust the product at a lower price (Combe, (2006).
G2	To integrate all entities in the supply chain through the internet so they can share data with each other to collaborate (with suppliers, business partners, and customers), to achieve a win-win situation for all members, reduce product life cycle (increase the time to market or lead time), improve market visibility, reduce overlap and stock-out of inventory, reduce transaction cost, expand business networks, and increase productivity and revenue (Mentzer et al. 2000; Zaremba et al. 2003).
G3	To align the supply chain process and maximize the role of each entity so that creates value for the end consumer and stakeholders and achieve great success than work alone (Simatupang et al. 2004).
G4	To be able to have higher visibility on the actual demand, reduce shipping cost by utilizing empty space in transit, and remove useless thing in the entire supply chain, such as cutting the shipping lanes (Simatupang et al. 2004).

5.1. Supply Chain Analysis

Based on the definition of home business, it indicates that the home business is still doing traditional business (without using internet on other technologies). Determination of the entities involved in the supply chain refers to theory of home business structure (Sulaiman et al. 2009). But in this case, government agencies and business associations are not included in the supply chain entities, as its role is not included in the delivery of products and services network, only as a supporting role outside the supply chain; such as regulation.

Supply chain entities defined in this study include supplier (manufacturer), customer changed into consumer, and business partner converted into reseller. Reseller also has consumers who are defined as a consumer of reseller. In this case, home business acts as a distributor or wholesaler.

Home business does not have a formal supply chain. For this reason, we tried to map the supply chain by using a model from (Kumaran and Ganesan, 2011) as shown by Fig. 2. Fig. 2 shows that traditional home business supply chain (without using internet) has the product flow which quite long and monotonous. In addition, the information is not valued enough, just sale and purchase transaction.
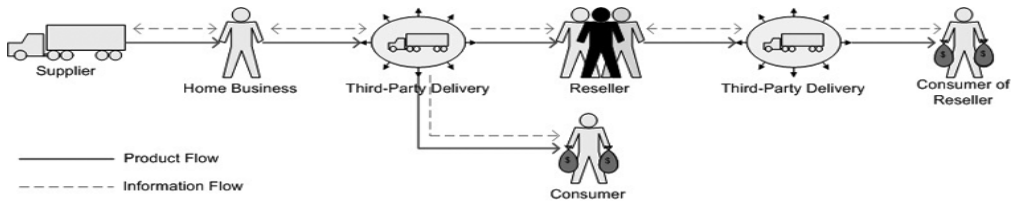
Fig. 2: Formal supply chain of home business (modified from Kumaran and Ganesan (2011)
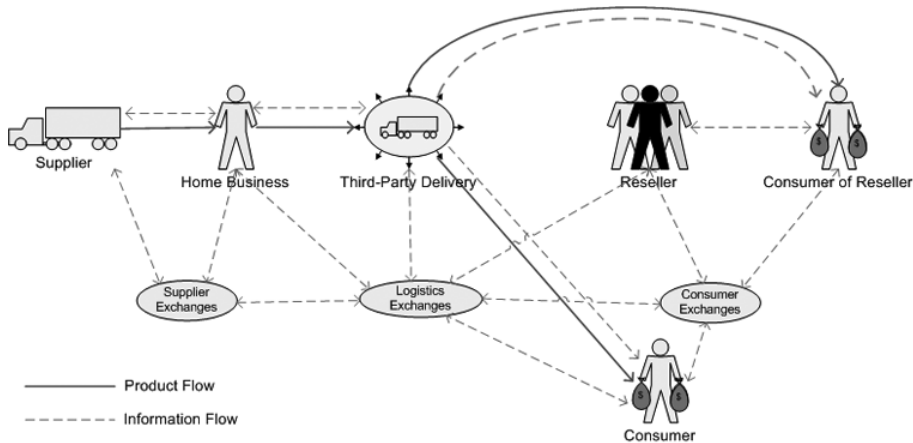
Fig. 3: Internet-integrated supply chain of home business (adapted from Kumaran and Ganesan (2011))

Meanwhile, Fig. 3 which describes internet-connected supply chain showing that the product flow is shorter than Fig. 2, as two chains are conceptually cut off. The information flow can also flow to the various directions (information exchange). In addition, characteristic of supply chain is also associated with its products. Product selected in this study is apparels—which is innovative product type. The paraphrase below will explain how to manage the supply chain related to the product type.

5.2. Supply Chain Based Business Solutions

5.2.1. Formulating Supply Chain-Based e-Business
To concept of supply chain-based e-business, the development aspect of SCM-based technology is used to fulfill the role and management of each entity involved

in the electronic environment, which consists of customer and service management (CRM), partner relationship management (PRM), supply chain planning, supplier relationship management (SRM), and logistic resource management (LRM). In addition, supply chain competence also used to complete the entire process. Supply chain competencies consist of customer management, supplier management, supply chain collaboration (SCC), and integrative technologies.

Customer management and CRM are in the same scope. For that, will be used just one naming only, i.e. CRM, but both will complement each other. Similarly, with supplier management and SRM, the naming used is SRM. While a win-win can be achieved by performing SCC. SCC has also been included in the supply chain competence. In addition, collaboration can also be achieved through supply chain integration through connecting technology, i.e. the internet (see Figure 3). Based on these basic concepts, we developed a supply chain-based e-business on the home business. It is shown by Fig. 4. Fig. 4 illustrates how the supply chain-based e-business is developed along the home business's supply chain with conceptually applying a win-win approach.
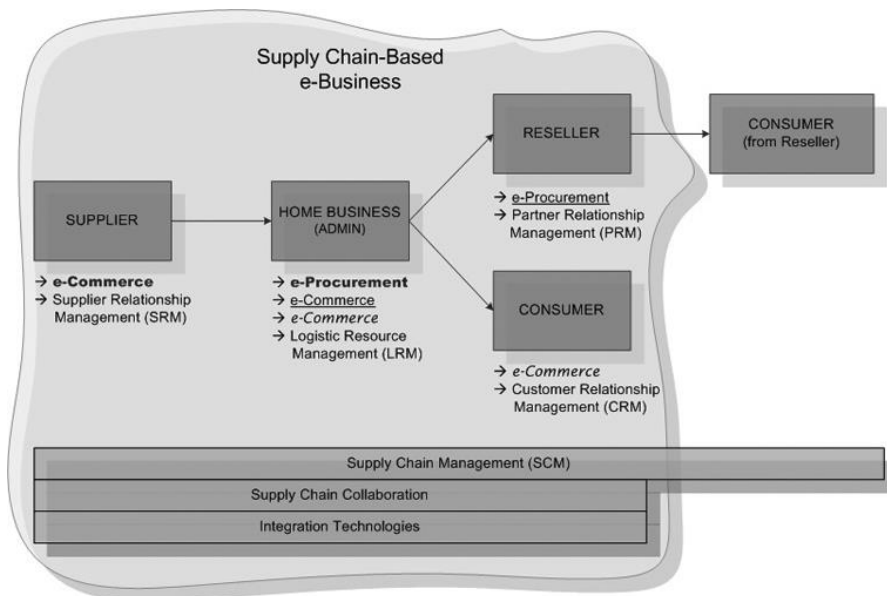

Fig. 4: The scheme of supply chain-based e-business concept on home business

The core system is in home business. It acts as a distributor/wholesaler so the concept developed to support it in doing business and relation to its partner. All entities in the supply chain, except the consumer of resellers, are integrated into several subsystems using the internet which the overall is called as e-business system (integration technologies). For that, integration technologies just described from supplier to consumer and resellers. The part that is in the light gray area shows

the scope of supply chain-based e-business. Consumers of resellers are not included in application and user of e-business, as it is fully proprietary reseller, however become entities considered in determining SCM. Meanwhile, SCC is conducted from suppliers, home business, consumer, to resellers.

The terms that used in the scheme of e-business system elements above are just seeing from the supply chain concept. Therefore, the angle must be viewed from each entity and cannot be limitedly seen only from one point of view; consequently, the subsystems (applications) that are predictably same can have different names in different entities, based on the functions of each subsystem on the entity.

Fig. 4 illustrates that both e-commerce (with bold letters) subsystem on supplier entity and e-procurement (with bold letters) subsystem on home business entity are basically similar; as they are viewed from different entities, then it causes they are entitled with a dissimilar name based on entity function. Regarding the side of suppliers, the subsystem serves as a media of product sales and transaction for home business (sell-side), so the subsystem is called as e-commerce; however, in home business view, the subsystem serves as a medium for goods purchase to supplier (buy-side), so it is called as e-procurement. Management that used is SRM, where it is a management concept in maintaining relationships and transactions with suppliers.

On home business entity contained e-commerce (with underline letters) and on reseller entity contained e-procurement (with underline letters too). They are actually the same application, because it is seen from different sides so we use different naming. On the home business side, the subsystem is called as e-commerce which serves as a home media of sales and business transactions to a reseller (sell-side). Meanwhile, if it is viewed from reseller' side, the subsystem can be named as e-procurement which serves as a medium to purchase procurement reseller to home business (buy-side). Management approach that is probably used is the PRM. In this PRM, we also regulated the services strategy which can home business give directly to the consumers of reseller.

On the side of home business, there is a LRM approach that serves to regulate the flow of each involved entities' logistics management and supply chain. Furthermore, still with the same pattern, on home business entity contained e-commerce (with italic letters) and on consumer entity contained e-commerce (with italic letters), which is the same subsystem or application. When it is viewed from the side of home business, it serves as a media sales and transactions to consumers (sell-side). Meanwhile, if it is looked from the consumer, it is used as a medium for ordering and purchase of products which consumers want to (buy-side). Management approach that can be feasibly used is CRM. It is a management concept in maintaining relationships and creating customer loyalty over time.

5.2.2. Supply Chain-based e-business Specification

There are five paraphrases of the above concepts. Supply chain integration is realized through the development of an integrated information system applications with the central is in home business. In detail, the integration of supply chain also manifested in its entity collaboration—it will be explained in point 3—and through functions that interconnected (cross-subsystem) to support other subsystems. Moreover, SCM will be combined with LRM. It will be done by the following collaborative steps. First, it can be done by periodically small batch purchasing, based on a minimum stock warning system (*early warning system*). Second, it can be done by cutting off the flow of delivery from resellers to customers through *drop-ship service*. It means that all product ordered by customers of reseller are directly going to be delivered by home business in the name of reseller name status. A product' storage will officially be centered on the home business and products will practically be delivered to the end users by using a third-party delivery service.

Furthermore, talking about SCC. Here is the formulation of the collaboration steps: supplier – home business, reseller – home business, and consumer – home business collaborations. The first, the supplier – home business collaboration, the supplier was asked to have a duty to always inform new product when the initial production; in this study is called early product. The goal is home business can get information earlier than its competitors, and such information will be distributed to resellers and consumers as survey to read trends so that production can really be done based on demand-driven. Moreover, supplier periodically gets information product trends from home business that is collected from the survey of the early product and request products from consumer and resellers.

The second is the reseller – home business collaboration. Here, the resellers provide feedback to home business of products and services which given to resellers and consumers of resellers, follow the survey product, and inform product resellers and its consumers want (request). And then, home business gives the reward of reseller loyalty. Moreover, home business provides a drop-ship service. The last one is the consumer – home business collaboration. At this time, the consumers give feedback on products and services, follow a *survey*, and inform the desired product (*request*). Then, home business gives the rewards for that feedback. The purpose of SCC can only be realized if each entity is able to perform the task well. To do that properly, the reward is set as a feedback of that.

Then, discussing about e-commerce (supplier-side) or e-procurement (home business-side) subsystem. This subsystem includes the process of e-commerce and e-procurement, combined with SRM so that functions are based on three aspects based on the basic theories. The special case of these functions is cooperation offers for the candidate of supplier in the resellers and consumers subsystem (cross-subsystem), which will bring potential candidate of supplier to general page of supplier subsystem. The next special case is a two-way collaboration (it is obviously

described in point 3) and the early warning to buy the procurement if the stock reaches minimum quantities.

Moreover, e-commerce (home business-side and supplier-side sub-system talked about. This subsystem includes the process of e-commerce and e-procurement, combined with PRM so that the functions are theoretically based on three aspects. Other than the general functions contained in e-commerce and e-procurement, the special case of these functions is the existence of offers cooperation which cross-subsystem (in the consumer subsystem) that can bring potential candidate of reseller to the reseller subsystem public page; two-way collaboration (as clearly described in point 3), the reseller can store her/his data consumers, resellers can customize the product code matches the code used to sell so it will make order process easier and predictably increase loyalty. And then, talking about e-commerce (home business-side and consumer-side). This subsystem includes the process of e-commerce and e-procurement, combined with CRM so that the functions are based on three aspects based on the underlying theory. The special case of these functions is a two-way collaboration (as described in point 3).

5.3. Discussion

Finally, the proposed concept possibly makes the home-business players realize a perfect way to do business. The players can operate all aspect in the technology based supply chain management (e.g. e-commerce, e-procurement, etc.) to optimize their business and get a win-win benefit among business partners. Thus, such a concept theoretically can be applied in practical business process in the home-business (as a part of SMEs).

6. Conclusion

Indeed, home business has a formal supply chain which is still conventional and outmoded (without internet use to optimizing activities). By integrating supply chain through internet, the products flow is predicted will be more efficient, and the information flow probably also can flow to various directions. Supply chain and e-business (as an alternative way for home business to do business) could be combined to be supply chain-based e-business. With apparel as selected product, this concept predictably will meet a win-win among supply chain entities, optimize role of each entity, and get more advantages.

Another business type also can implement this concept, especially if their product type is innovative. Nevertheless, for functional product case, such as books and foods, they need to formulate a new supply chain strategy more; because of the crucial different of characteristic product. The further study can be possibly done is one study to realize this concept into the prototype system. It also can be exposed about how to get the requirement from the goals, what feature which can predictably fulfill the concept, and how it appearance.

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