

## TRANSFORMING TRADITIONAL BUSINESS MODELS THROUGH DISRUPTIVE TECHNOLOGY

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### **Abstract:**

The application of disruptive technologies to business processes has given rise to new business models. Three of the disruptive technologies discussed here are software, the Internet, and Web 2.0. Businesses that implement these technologies are able to automate value chain activities, disintermediate supply chains, and benefit from customer contributions. Each disruptive technology and its application has implications for the firm's value chain and supply chain, and leads to a new e-commerce model incorporating a new term, *customersourcing*. In this paper, the authors propose to coin the term *customersourcing* as a subcategory of crowdsourcing and a method of eliciting contributions from a firm's customers. This paper considers the implications of each technology in sequence, with each step resulting in a change in the supply chain and/or the value chain. The culmination of these changes is an e-commerce model that relies on CustomerSourcing to provide certain business functions of both the supply chain and the value chain.

*Keywords: Customersourcing, Crowdsourcing, Supply Chain, Value Chain*

## 1. INTRODUCTION

Disruptive technologies are changing business processes. Some applications of disruptive technology are confined to particular business functions; others have implications for the entire value chain and/or supply chain. This paper looks at the relationship between the supply chain and the value chain and applies disruptive technologies to them. The implications of each technology are considered at each step in the evolving supply chain and/or the value chain models.

First, this paper establishes foundational concepts to be considered as they apply to the impact of disruptive technologies. These concepts include defining disruptive technology, describing e-commerce, introducing the value chain and supply chain, and describing crowdsourcing. The second part of the paper applies automation, the Internet, and Web 2.0 to value chain and supply chain models. The paper coins the term *customersourcing* as a subcategory of crowdsourcing and a method of eliciting contributions from a firm's customers.

## 2. BACKGROUND

The foundation of this paper rests on four basic concepts.

### **Disruptive Technology**

Disruptive technologies displace established technologies; often resulting in the replacement of incumbent businesses by new market entrants; causing traditional business practices and models, to become obsolete or restructured (Danneels, 2004).

### **E-commerce**

Many businesses have realized significant changes in supply chains and value chains through e-commerce (Laudon, 2012).

Businesses can deploy two different types of web strategies: an informational/communicational strategy and an online/transactional strategy (Goi, 2007). This paper and the models put forth are most applicable to e-commerce businesses that are using an online/transactional strategy. Several types of e-commerce business models exist within this strategy, including: portal, e-tailer, content provider, transaction broker, market creator, service provider, and community provider (Laudon, 2012).

### **Value Chain**

The value chain is a model that describes a series of value-adding activities connecting a company's supply side with its demand side (Rayport & Sviokla, 1995). This paper considers the application of automation and Web 2.0 to businesses and the effect on value chains. Figure 1 depicts Porter's value chain activities (1985).

Figure 1: Value Chain Activities



Narrowing the scope of the value chain, this paper considers only the *internal* value chain; existing within each entity in the supply chain, as opposed to across multiple entities. Analyzing the value chain helps businesses identify the ways in which they create value for customers and how to maximize it (Value, n.d.).

Automation of value chain activities is not new, but has grown in both scale and in complexity. The first aspect to note is; businesses are automating across an increasing number of business functions, therefore software affects a larger number of business functions. Software is a disruptive technology, resulting in a different distribution of value chain activities.

Human jobs are increasingly lost to their machines. This is due to the relative low cost of using machines, the quantity of information processed, cloud computing, and smarter machines (Wiseman, 2013). Software has evolved from handling menial, repetitive tasks to emulating decision-making roles traditionally performed by management.

### **Supply Chain**

The supply chain model shows goods and information flowing from a supplier to customer; it is relevant for non-physical and physical products, such as the flow of *information* from suppliers to customers (Kathawala, 2003). A traditional supply chain model is depicted in Figure 2 (Harland 1996).

**Figure 2:** Traditional Supply Chain



Like the value chain, the supply chain has been subject to disruptive technologies. In this paper, the supply chain model will be modified to demonstrate the impact of disruptive technologies.

The Internet has aided in the collapse of the middleman through disintermediation of the supply chain by creating a virtual business platform where suppliers and customers can interact directly (Laudon, 2012).

### **Crowdsourcing as a Result of Web 2.0**

Web 2.0 is a more user-focused feature of the Internet. It allows information services to become more dynamic (Tredinnick, 2006). As a result, businesses now use sources outside of the firm to perform business processes. Crowdsourcing is “a new web-based business model that harnesses the creative solutions of a distributed network of individuals through what amounts to an open call for proposals” (Brabham, 2008). “A growing body of empirical work shows that users are the first to develop many and perhaps most new and industrial consumer products” (VonHippel 2005). Crowdsourcing endorses the notion of “wisdom of the crowd,” which is “the finding that the aggregate of a set of proposed solutions from a group of individuals performs better than the majority of individual solutions” (Yi, 2012).

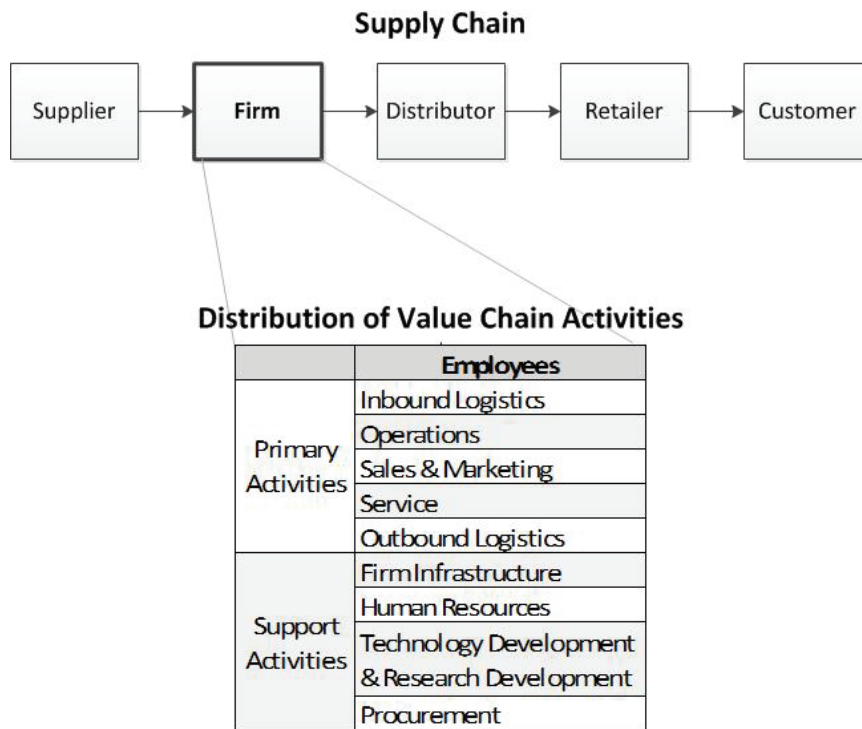
## **3. BODY**

The application of disruptive technologies to businesses can be traced through a progression of value chain and supply chain models. First, a model that incorporates both the supply chain and value chain is introduced. Second, the impact of automation on value chain activities is considered. Third, the impact of disintermediation on the supply chain is reviewed. The fourth section coins the term “customersourcing” and explains its impact on both the value chain and the supply chain.

### **The Traditional Model**

The traditional supply chain and the distribution of value chain activities within a firm are depicted in Figure 3.

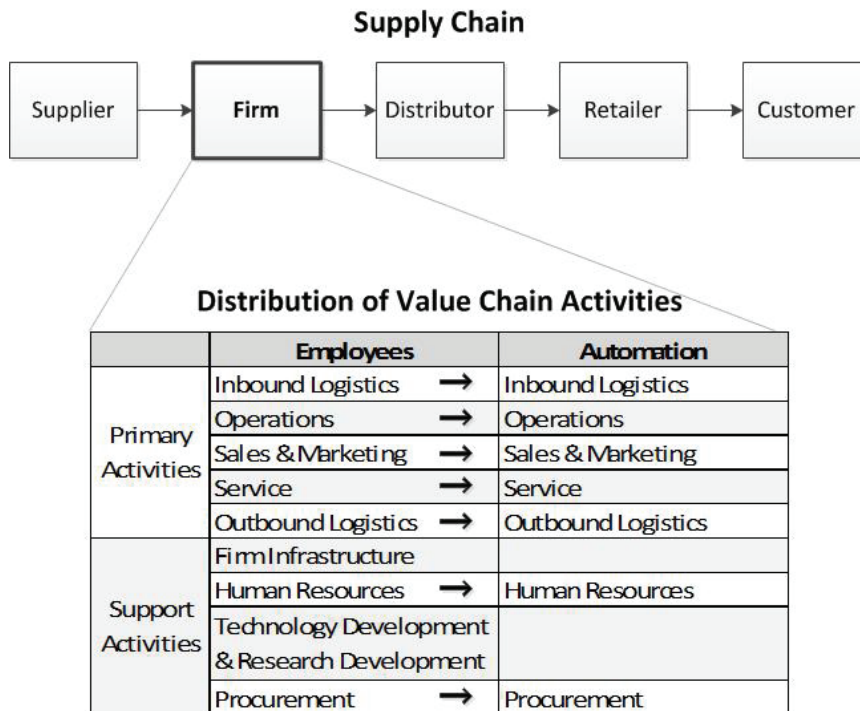
**Figure 3:** The Traditional Supply Chain and Distribution of Value Chain Activities



**Automation of Value Chain Activities**

The automation of value chain activities using software is depicted in Figure 4.

**Figure 4:** Supply Chain and Value Chain Models after Automation



Automation changes how entities of the supply chain interact with each other; however, the supply chain portion in Figure 4 remains intact. Businesses are using software agents responsible for many activities across the supply chain. Intelligent agent technology offers the potential to overcome many

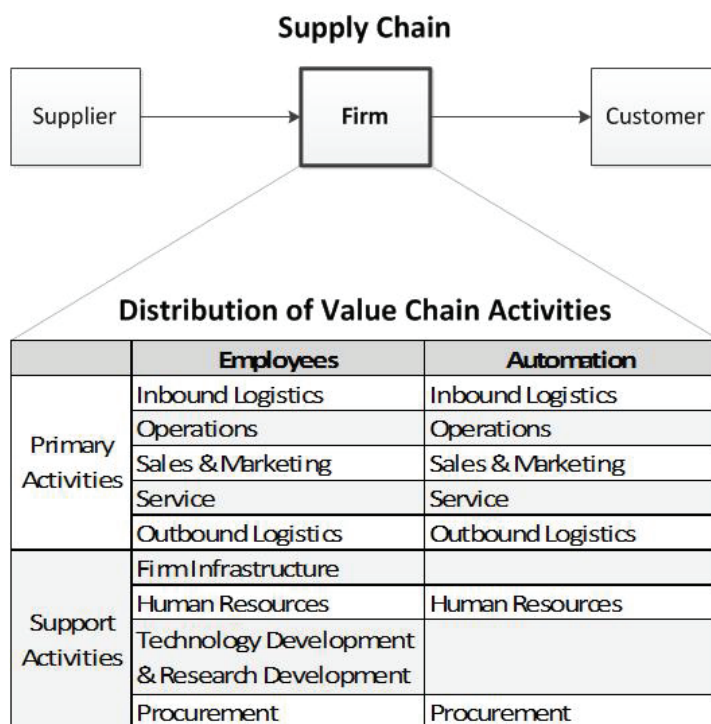
limitations of current supply chain technologies by collaborating with other parts of the supply chain and make strategic decisions on an unprecedented level. (Nissen, 2001)

Business Process Automation (BPA) is the “technology-enabled automation of activities or services that accomplish a specific function or workflow” (Rouse, n.d.). The automation of activities does not always result in the elimination of employee involvement, but often completes time-consuming tasks more efficiently. The automated value chain activities include logistics, operations, sales and marketing, service, human resources, and procurement. Automation spans many different value chain activities as well as many different industries.

### Disintermediation of the Supply Chain

The application of the Internet to business has disintermediated supply chains. Disintermediation creates a direct interface between the firm and its customers (ex: the use of web pages). This virtual marketplace exists on the line between the firm and the customer in Figure 5.

Figure 5: Supply Chain and Value Chain Models after Automation and Disintermediation

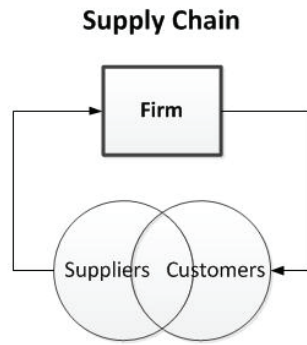


### Customersourcing

Increasingly, customers are playing roles in businesses that surpass having needs and purchasing products (VonHippel, 2005). “As information proliferates, control is being gradually ceded to users, opening up the possibility of a new, more democratic, and more evaluative phase in the exploitation of information within organizations.” (Tredinnick, 2006) The value chain activities that customers take partial or full control of include Operations, Sales/Marketing, Service, and Research/Development. The redistribution of value chain activities and the implications for the supply chain model are depicted in Figure 6.

This paper coins the term *customersourcing* as a subcategory of crowdsourcing, wherein a community of customers contributes to a firm by performing its value chain activities and/or acting as its supplier. Customersourcing also applies when the contributor is a *potential* customer whose interests or characteristics sufficiently align with those of customers. This happens when customers and suppliers exist within a common community, where preferences prevail and members are incentivized to common goals. For example, open source software community members are users and contributors alike (Durkovic, 2008).

**Figure 6:** Supply Chain and Value Chain Models after Automation, Disintermediation, and Customersourcing of both Value Chain Activities and Supply



**Distribution of Value Chain Activities**

	Employees	Automation	Customers
Primary Activities	Inbound Logistics	Inbound Logistics	
	Operations	Operations →	Operations
	Sales & Marketing	Sales & Marketing →	Sales & Marketing
	Service	Service →	Service
	Outbound Logistics	Outbound Logistics	
Support Activities	Firm Infrastructure		
	Human Resources	Human Resources	
	Research & Development		Research & Development →
	Procurement	Procurement	

With customersourcing, the supplier and customer of the supply chain are bent inward until they overlap. The convergence represents a fluid population of people who are customers and suppliers simultaneously. This situation often exists when a firm hosts a community of users on the web. Even though some contributors are not current customers, customersourcing is still applicable due to their potential to become customers, whose interests or characteristics are sufficiently aligned with actual customers. The personal dating site, Match.com, is an example of pure customersourcing.

#### 4. CONCLUSION

Many new e-commerce businesses have emerged from value chain automation, supply chain disintermediation, and customersourcing. Disruptive technologies enable these processes.

The application of disruptive technologies has had implications on traditional business models. The activities of the value chain have been distributed away from employees to automation and customers. The supply chain has been disintermediated, so that firms interface directly with their customers. Value chain redistribution and supply chain disintermediation have culminated in customers acting as suppliers, and performing value chain activities. This contribution from the customers is a subcategory of crowdsourcing, and has been coined *customersourcing*.

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