E-Business Solutions in the Cable TV Industry

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Abstract. This paper aims at developing implementable e-business solutions for the cable TV industry to accelerate the information technology and information system adoptions; and thereby, increase value for the operations in the industry. Specifically, an electronic value chain is developed to show how to improve value by using information technology and information system. Then, a set of implementable solution items are developed based on this electronic value chain model. Finally, recommendations are provided on how to implement these solution items.

Keywords: Value chain, cable TV industry, electronic business.

1 Introduction

Although many large cable TV providers are fully utilizing the Internet and transforming their business operations to include complex e-Infrastructures and IT applications, other providers are slow to move to e-business solutions because of high costs, risks, business reengineering, and failure to recognize the future value shifts toward online television viewing [2]. Cable TV industry providers that neglect to exploit e-business solutions are not aligning their information systems (IS) with their business and organizational strategies. Since IT is integrated in nearly all business aspects, as technology develops, companies must change IS quickly to meet market demands and compete effectively. Cable TV providers, therefore, should use scalable e-Infrastructures for e-business solutions to increase time-to-market speed, expand business functionality, lower costs, improve customer satisfaction, and increase revenues[3] [4] .

As more customers migrate to the Internet and wireless devices for their television viewing, the cable TV industry will encounter considerable reformation. Cable TV providers that do not adopt sufficient information technology applications and solutions in their supply chain will encounter massive revenue losses, similar to what the music industry experienced at the turn of the 21st century, before iPod and iTunes [2]. As it stands now, the abundance of technology and Internet programming are already forcing cable TV providers to offer premium online TV content to their existing customers to keep them from accessing online shows through free Internet sites, such as YouTube and Hulu [1]. Since the US cable TV market is a mature and heavily saturated industry, increased free television electronic content and online

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viewing could lead to decreased national cable TV industry growth and increased industry competition [8].

Comparing with other industries, IT adoptions in the cable TV industry are still slow. Increased online television viewing may bring about many operational challenges resulting from increased consumer broadband traffic, limited provider bandwidth, and network system bottlenecks, which will cause significant delays of e-content delivery [9][10]. The purpose of this paper is to develop an electronic value chain model for the cable TV industry, decompose this model into a set of implementable solutions for increasing value for the cable TV industry, and provide recommendations for e-business solution implementations.

The remaining of this paper is organized as follows: Section 2 presents a value chain model for the cable TV industry. Section 3 develops a set of e-business solutions based on the value chain model. Section 4 provides discussions, recommendations, and conclusions.

2 Electronic Value Chain Model

Fig. 1 presents a value chain model based on the utilization of IT in the cable TV industry. This model was developed based on Michael Porter's value chain with five primary activities (inbound logistics, operations, outbound logistics, marketing and sales, and services) [12].

Inbound logistics involves receipt of programming content, equipment, inventory storage and management. Cable TV operators can receive, track, and manage video inventories, such as video-on-demand VoD and pay-per-view PPV, online by processing incoming video libraries in batches [2]. For live content delivery, real-time streaming is used and, therefore, the content simultaneously goes through inbound and outbound logistics to reach subscribers. For equipment inventories, cable TV providers can use just-in-time (JIT) inventory systems in order to achieve efficient inbound logistics. For example, a barcode strip can be assigned to each individual piece of television, Internet, and telephone equipment to facilitate easy e-tracking of inventory issued to technicians and contractors for installation. At the end of the day, scanners can be used to return the bar-coded inventory items to the warehouse to be placed back in stock.

Operations in the cable TV industry include in-house content production and packaging, content management and protection for both television and Internet outlets, and facility operations. Cable providers package television programming received from inbound logistics into two main tiers, basic and digital. The digital packages consist of premium content and include access to VoD, PPV, DVRs, and HDTV services [1]. To remain viable and earn profits, content library management and protection becomes increasingly important, especially when incorporating on-demand and pay-per-view options with Internet TV. Also, since many subscribers utilize the Internet to manage their cable TV accounts, offering secure e-payment systems and protecting users' stored personal data by using encryption is critical for cable TV operators.

The incorporation of electronic data interchange (EDI) into facility operations assists in creating more efficient supply chain relationships. EDI technology "enables

the transmission of routine business documents having a standard format from computer to computer over telephone or direct leased lines" [6]. Cable TV providers utilize EDI to improve communication between programming networks and advertising agencies to manage advertising spot schedules and build an e-infrastructure for e-business [7].

Outbound logistics in the cable TV industry involves video, data, and telephone service delivery to subscribed users. Increasingly, cable providers have been using Web-based technologies to deliver television and advertising content over the Internet. Today, e-logistics, including e-service distribution, e-content delivery, and online VoD and PPV order dispatch enable automated distribution of movies, sport and concert events, to the end-user via the Internet. Also, due to e-logistics, viewers are able to actively interact with their service providers and receive products and services at faster speeds.

Marketing and sales efforts can also be enhanced by the use of technology. For the cable TV industry, e-marketing includes e-advertising, e-sales, web-based press room portals, online newsletters and e-mail usage. Besides Web portals, e-mail selling and e-advertising is very common in the cable TV industry. An investigation of the top twenty companies' web pages revealed that each company does an excellent job in e-advertising their own products and services via their own Web pages.

Customer service represents the last function within the primary activities of the value chain. Although firms are mostly concerned with cost savings and quality, time savings can ultimately be the deciding factor between keeping a customer and loosing a customer to the competition [11]. Today, cable operators must meet customers' busy on-the-go lifestyles by providing fast, efficient, and satisfactory customer service. Utilization of technology, such as customer relationship management (CRM) software, online chat, online account management, e-troubleshooting of program and video errors, e-order confirmation of purchased programs, e-feedback, e-testing of equipment, and e-mail will increase customer satisfaction, acquisition and retention.

Primary Activities				
Inbound Logistics	***Operations***	***Outbound Logistics***	***Marketing and Sales***	***Customer Service***
- E-tracking of incoming programming, - Just-in-time (JIT) advertising inventory, - JIT inventory: cable wires, set-top boxes, satellite equipment, - VOD and PPV movie storage, - Digital inventory management.	- E-content production and packaging, - E-content management, - Electronic Data Interchange (EDI), - E-maintenance, - E-content protect, - E-service installation scheduling - E-mail.	- E-service distribution, - E-communication, - E-content delivery, - Online VOD and PPV order dispatch, - B2B network for online sales.	- E-advertising, - E-sales, - Web-based Press Room, - E-mail, - Online Newsletters - Online Publishing Services, - Online rewards / rebates.	- CRM software, - Online chat, - Online account management, - E-troubleshoot, - E-order confirmation, - E-feedback, - E-testing, - E-mail.

Fig. 1. IT Adopted E- Value Chain Model for the Cable TV Industry

3 E-Business Solutions

E-business solutions are IT applications that are utilized in an industry's e-value chain. This analysis paper focuses on five categories of e-business solutions: B2B (business-to-business), B2C (business-to-consumer), C2B (consumer-to-business), B2G (business-to-government), and B2I (business-to-internal).

Since the cable TV industry provides video, Internet, and telephone services to business customers, governmental customers, and residential customers, some e-business solutions are utilized in more than just one category. For instance, e-communication and company websites are used in both B2B and B2G categories, while more specific e-communication applications, like e-mail alerts, exist in B2C relationships. Research shows that the majority of e-commerce happens in the B2B and B2C categories since government has been somewhat slower at adopting e-business solutions [5]. However, presently, government e-commerce is increasing and companies can greatly benefit from incorporating e-government into their e-commerce business models.

The focus of this research paper is to analyze e-business solutions present in the cable TV industry's e-value chain model. Table 1 lists 54 e-business application items employed by the cable TV industry, summarized by e-business categories.

Table 1. E-Business Solutions for the Cable TV Industry

12 Items B2B	24 Items B2C	3 Items C2B	7 Items B2G	8 Items B2I
E-Business Portal	E-News Portal	Online Customer Feedback	Cable in the Classroom	E-Knowledge management and Sharing System
E-Payment System	Electronic Program Guide	Online Job Search/Application	E-Payment System	E-Human Resource Management (HRM)
E-Procurement	Interactive Television (ITV)	E-Parental Controls	E-Public Access Television	E-mail
E-Communication	E-Mail Alerts		E-Military Access	Internet
Electronic Data Interchange (EDI)	Online Advertising		E-911 Service	Intranet
E-search	Online Account Management		E-Communication	Electronic Teams
Online Cable Ad Inventory Management	E-Customer Help / Support		Company Website	Employee E-Training and E-Learning
Company Website	Online Security			Digital Technology
Online Clearinghouse	Online Shopping Mall			

Table 1. (*continued*)

Extranet Interface with Suppliers and Partners	Online Equipment Testing/Upgrade			
Online Partner Ads	Online Data Storage			
Wireless E-mail	Online Multilingual Services			
	E-Interactive FAQ's			
	Video-On-Demand (VoD)			
	Pay-Per-View (PPV)			
	Online Customization Tools			
	Online Outlet Locator			
	E-Video Error Repair			
	Live Online Chat			
	Online Games/Music			
	Online 3D Content			

4 Discussions, Recommendations and Conclusions

The cable TV industry has gone through many technological changes in the last ten years. The introduction of innovative technologies, such as interactive television, VoD, PPV, DVR, online TV, and lately, 3D TV, has revolutionalized the cable business into a complex and dynamic industry. The cable TV industry value is shifting from traditional broadband viewing to online and wireless television viewing access. Consumers' desires and trends toward on-the-go flexible programming and Internet information access are forcing companies to innovate and "get in front of the [technology] change or the consumers [will] threaten to leave them behind" [2]. As such, many cable TV companies currently employ various e-business solutions to improve efficiency, reduce waste, and increase information flow between activities in the value-chain with the sole end goal—to satisfy the ultimate customer.

In this paper, the e- value chain model was developed to illustrate how various applications could increase traditional value creation through the use of IS technology [12]. Further, e-business solutions were analyzed at each step of the e- value chain to better illustrate linkages and relationships between various activities in the e-value

chain, e-business applications, and five e-business groups (B2B, B2C, C2B, B2G and B2I).

Clearly, if cable TV operators desire to achieve strategic competitive advantages vis-à-vis their rivals, they need to adopt as many practically useful e-business solutions as possible. Of course, adding random e-business solutions without considering value enhancement, operations efficiency, and cost reductions is not recommended. However, in light of the research and analysis provided in this paper, it is evident that adopting less valuable e-business solutions can lower a company's status in the market place. A prime example is Armstrong Cable Services, which is ranked twentieth by NCTA in terms of US market share, and which also has the lowest e-business solutions implementation rate.

Future research will focus on data collection for the top companies in the cable TV industry to see the implementation patterns of these e-business solutions; and thereby, provide suggestions and guidelines on how to improve value for the cable TV industry in general.

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