

10/11/09

SOUTHAMPTON SOLENT UNIVERSITY  
FACULTY OF TECHNOLOGY

**ADDING VALUE TO FORD MOTOR CO SUPPLY CHAIN**

Academic Year 2006-2007

**JAMES TETLEY  
TIMOTHY STEAD  
CRAIG ELDRIDGE**

**E BUSINESS**

Tutor: N Whitelegg

March 2007

This report is submitted in partial fulfilment of the requirements of Southampton  
Solent University for the degree of  
BSc (Hons) Computer Networks and Web design

## **Summary**

This report identifies the process taken to add value to Fords supply chain, it doesn't cover Fords complete supply chain network due to the sheer size of their company. Instead it relates to four perspectives relating to different parts of their supply chain. It shows how value is created using the Amit & Zott model using novelty, lock in, complementarily, and efficiency as a means to apply value. Each topic has been research by each group members and the information has been articulated to form this report, which critically evaluates Ford's supply chain and how they add value to it. Please take your time to read through as the information in the findings is very interesting.

**Table of contents**

*Summary* ..... 2

**BACKGROUND AND INTRODUCTION** ..... 4

    2.0 *Terms of Reference* ..... 4

    2.1 *Aims* ..... 4

    2.2 *Objectives* ..... 4

    3.0 *Findings* ..... 5

    3.1 *What is Value*..... 5

    3.2 *Ford Motor Co Novelties* ..... 5

    3.3 *Ford Motor Co Lock-in* ..... 9

    3.4 *Ford Motor Co Efficiency*..... 13

    3.4 *Complementarities* ..... 14

    4.0 *Conclusion*..... 16

    5.1 *Internet Links* ..... 18

    5.2 *Articles* ..... 18

    5.3 *Books* ..... 18

## **Background and Introduction**

Ford Motor Co is an automotive company that supplies vehicles to customers and companies. Ford uses a complex supply chain that spans their entire business dealing with manufacturing, sales, after sales and marketing etc. The purpose of this report is to critically evaluate the issues associated with adding value to Fords complex supply chain. As the stature of Ford is so prestige and extensive it would have been impossible to completely evaluate their supply chain, therefore four instances where adding value had occurred were researched and related to part of their supply chain. The four sources of value creation have been identified and are present in the workings of Ford. Each source relates to the R. Amit and C. Zott value creation model. To understand how value is added within their supply chain we must first understand what value actually is...

### **2.0 Terms of Reference**

#### **2.1 Aims**

- Identify the main differences between a supply chain and a value chain
- Identify in detail the four steps involved in adding value to fords supply chain
- Relate research from a variety of perspectives, as demonstrated by the Amit & Zott model
- Critically evaluate the issues associated with adding value to Ford's supply chain

#### **2.2 Objectives**

- Plan each aspect of the reports criteria
- Research into supply chains and how they work
- Research into how Ford implements its supply chain
- How does ford add value to their supply chain
- How does the value adding process relate to Amit & Zott
- Allocate group members to different Amit & Zott methods and research them
- Process each group members research into a report format
- Critically evaluate the findings from each group member

### **3.0 Findings**

#### **3.1 What is Value**

<sup>(1)</sup> Value is a subjective experience that is dependent on the context. Value occurs when needs are met through the provision of products, resources or services usually in the form of a transaction or exchange. Value is an experience, and it flows from the person that is in charge of the recourse and the customer.

A value chain is different to a supply chain in the essence the flow of value is in a different direction. Supply chain value flows from the person in charge of the recourse, the value chain value flows from the customer. <sup>(2)</sup> The value chain concept was developed and popularised in 1985 by Michael Porter, who implements the strategy to achieve superior business performance. In short Porter defined a product can have any value it just depends on how much the buyer is willing to pay on the bases of how much they need that product.

The primary focus of a value chain is on the benefits that relate to the customer, the process that generates value and the resulting demand and funds that are created. A well designed value chain will generate profits. Value relates to the customer and only occurs when customer needs are satisfied. By working to customer needs and organising activities around these needs reduces, time and costs etc. <sup>(2)</sup> Porter defines value from the customers perspective, it comes from two critical factors, who is the customer and what do they need.

#### **3.2 Ford Motor Co Novelities**

Novelty is a key link in the <sup>(3)</sup> R. Amit and C. Zott adding value model. It's the process of creating opportunities to a company with the introduction of new products, methods of production, distribution, marketing or tapping of new markets. Introducing novel ways to perform the same or new methods of producing a product etc provides better efficiency and a lock-in to the customers. Novelty provides a link between efficiency and lock-in which value is created and added to the supply chain.

---

1 Article: Value Chains VS Supply Chains, by Andrew Feller

2 Article: M Porter, competitive Advantage, creating and sustaining superior Performance

3 R. Amit and C. Zott model, novelty lecture notes

Three instances have been discovered where Ford Motor Co have introduced new novel way to help improve efficiency and also a lock in the customer. The first instance was the introduction of Radio Frequency ID tags (RFID) supplied by Where Net in a joint venture between TNT Logistics North America and Ford Motor Co to help increase the efficiency within their supply chain. <sup>(4)</sup> In 2005 TNT logistics North America Launched an RFID initiative designed to help its automotive customers automate workflow, provide real-time visibility, reduce inventory and prevent business interruption in their complex supply chains. This initiative was piloted to Ford's F150 truck assembly plant in Dearborn, Mich. This venture provided a lock-in to TNT as Ford use their service to make there supply chain more efficient.

The introduction of this new Idea contributed to the success of Ford and other companies that are using the service. The essence of value adding is embracing of novel technologies and developing innovation.

TNT has a material sequencing centre (MSC) that receives, picks, packs and ships parts to the Ford F150 assembly plant. The parts are sequenced into custom-designed mobile racks that are ready for delivery to the plant for immediate installation on vehicles moving down the assembly line. As part of the Ford/TNT initiative, active RFID tags and a network of wireless locating sensors are set up to provide real time location and status information for the mobile racks shared between the MSC and the Ford Assembly plant. Devices located at the dock doors, trigger the RFID tags that identify the parts in the racks. The system triggers a shipping notice called an advanced shipping notice (ASN) so the factory knows the parts are complete and they are en route.

Deploying this new idea in Ford's supply chain provided real-time visibility of all parts as they move from the supplier to the carrier, the MSC, the plant and ultimately the final destination, the assembly line. This solution in the long run helps Ford to automate workflow, reduce inventory and prevent business interruption in the assembly plant. At this instance you can see, Ford have used the initiative from TNT logistics to make there supply chain more efficient by reducing costs on inventory and simplifying there supply chain. Another instance is the lock in to TNT logistics; they now have the trust of Ford as they are supplying them with parts that will always arrive without error. But both

---

4 Article: Adding RFID to Ford's Supply Chain

companies are relying on the RFID product supplied by Where Net which is in fact using TNT and Ford as their lock-in.

A second instance where a novel idea was introduced was during the research of this project, we attended as a group to the Ford assembly plant in Southampton. We watched as the assembly line received parts from a supplier, process the parts into different sections, then build the transits from scratch using automated robots that build individual parts as they pass down an assembly line. The RFID method mentioned above was in use at this plant but went by a different name, it ensured automated workflow, real-time visibility, reduced inventory and prevented business interruption. After talking to a few members of Ford we found that they release a new transit build every year, but they work a year ahead of their own market, planning and running test production of the latest model before they have release the latest model the year before. They use TV and sponsor ships such as Motor Rally and football as a novel way to entice new customers and also out bit upon rival companies.

The third Instance where a novel idea was introduced to add value to their supply chain and also compliment efficiency and lock-in was the new methods used to minimise the time a customer spends at the outlet dealer for repairs or maintenance on vehicles. <sup>(5)</sup> Identified that customers who are waiting on the parts for repairs were waiting up to 87 days in the supply chain after market. Ford introduced a novel program to overhaul its supply chain to track dealer's services parts lists.

<sup>(5)</sup> Ford vowed to improve customer service at the dealership. The error with their dealership was found with the distribution centres, when parts for repair come in they have to pass through several processes before they can be sent to the dealer. The locations of the dealers played a big part in this error, as they were so far away from parts factory, the customer would have to wait a long time for the goods to arrive before being processed. The first step that was taken was the realisation of each part, the special characteristics, where it's needed, how fast it shipped, and its nature. Understanding these key points Ford was able to make arrangements for deliveries with better performance. This led to the launch of the daily parts advantage (DPA) network for getting spare parts to dealers. The process increased the number of distribution centres in the U.S., from 10 to 21 centres. Parts would be sent to the dealers and restocked on a daily basis

---

5 Article: Aftermarket is no longer an afterthought by Robert j. Bowman

therefore customer waiting time was reduced as the delivery time to the dealer was increased. Taking into count the realisation of each parts importance, Ford decided to open three distinct types of parts warehouse.

**Ref (5)**

*One warehouse for small high volume parts that are delivered on a daily basis, one low volume for small slow moving parts (24 hour delivery), and one for large bulkier parts for deliveries that would take 2 to 3 days.*

They placed these warehouses as close as possible to the dealers, in doing so this new method provided a repair order fill rate at 95% over the rate before.

The new method provided:

- A reduction in the supply chain cycle to 37 days as of 2003
- A 40% decline in inventory levels
- A rise in customer fill rates
- An 85% reduction in customer back orders

These figures were calculated at the suppliers end, using a series of metrics, coupled with report cards to monitor supplier performance. As this new system complimented efficiency in terms of efficient use of inventory it also allowed Ford to not only expand the system across its global supply chain but enables them to take the next step. The next step was to obtain end-to-end visibility of service parts, increase the speed of time to market, optimise inventories at each location, and generally do a better job of serving the customer. This next step <sup>(5)</sup> Ford turned to Caterpillar Logistics Service, Inc., the third-party logistics (3PL) arm of Caterpillar Inc., and SAP AG, the German-based business software giant. The partnership between Ford and Cat provided the foundations for development of a new information system that provided the next step mentioned above. This made Fords supply chain more efficient as dealers would be able to have direct access to inventory data on a real time basis, allowing them to improve scheduling and cut service time. It also provided a lock in with both companies as they were sharing data to radically change the way their supply chains work. The two companies appeared to be getting into the business of software development, when in fact they turned to SAP for resource planning software due to its



expertise in supply chain software, financial strength, and global business support. SAP is a huge company that supplies off the shelf supply chain management software, but SAP software couldn't address the huge volumes of parts handled by Ford on a daily basis, nor could they combine supply chain processes with customer-relationship management (CRM). SAP had to create a complete new system by integrating numerous other systems that control processes across Fords supply chain.

*ref (5)*

*Materials-management function alone consisted of multiple systems on platforms 30 years out of date, all had to be dumped in favour of the new system.*

Ford and Cat worked together using their respective expertise in parts management to contribute to this new system. The actual development was up to SAP, the product was completed in 2001 and the deal between Ford and Cat Logistics was formally announced. The new software was released under the umbrella of the mySAP Business Suite, incorporating both SCM (Supply Chain Management Software) and CRM (Customer-Relationship Management). When the software was installed it provided end-to-end visibility of service parts, increase the speed of time to market, and optimise inventories at each location. This provided both Ford and Cat with an optimised supply chain that is efficient, enable SAP to stay on top of the market as a leading supplier of cutting edge SCM technology. Both Ford and Cat have a lock in with SAP as they supply the software and SAP use the two companies to piggy back off of to gain more respect using their financial strength.

### **3.3 Ford Motor Co Lock-in**

*Ref (6)*

*The value creating potential of an e-business is enhanced by the extent to which customers are motivated to engage in repeat transactions.*

Repeat transactions can be encouraged by situations that cause lock-in. In the case of Ford, lock-ins can be created from the following:

### Personalised vehicles

Ford customises vehicles for companies such as RAC, AA and Royal Mail, they supply vehicles such as breakdown trucks, tipper trucks and chassis cabs. These companies all get priority service meaning that once they place an order they 'jump the queue', and all the regular orders get moved back. This creates trust and a good business relationship between the two companies.

### Loyalty programs

Ford gives their large customers extra discounts known as their 'privilege purchase' scheme. They also offer a discount to staff. This helps compete against other manufacturers trying to under-cut them on price in order to win the order.

### Servicing

During the first three or four years after a vehicle has been sold by a Ford dealership most vehicles are brought back to the dealership for services and maintenance. Many people do this as they feel it necessary to have a main dealership service history otherwise they feel that their vehicle will be worth less when they come to sell it.

### Reputation

This alone is a very good lock-in as they have built very good relationships and reputations with customers. This gives customers a good reason to stay with them.

### Building upon transaction history

Ford has lock-in over other companies that supply components due to their buying power. They buy in extremely large quantities and their orders are highly valued among suppliers, the suppliers compete among themselves to win the orders by cutting the prices as much as possible.

Brand name and trust (RBV (Resource based view) theory) <sup>(7)</sup> resources are defined as stocks of firm-specific assets; they cannot be easily duplicated and cannot be easily acquired in well-functioning markets

Examples:

- Patents and trademarks
- Brand-name reputation
- Installed base
- Organizational culture
- Workers with specific expertise or knowledge

The combined effects of this lock-in create the potential value of the business. Lock-in helps reduce the amount of customers that take business elsewhere to competitors. In the case of Ford's lock-in causes repeat orders, guaranteed future orders and forced orders. This could happen because <sup>(8)</sup> when switching costs from one brand to another are substantial, customers face lock-in. For this reason an existing customer base with high switching costs is a significant and valuable asset. Shapiro and Varian state "The present discounted value to a supplier of locked-in customers is equal to the total switching costs, plus the quality or cost advantage of the current supplier's products".

Lock-ins can be caused due to compatibility issues, for example, Ford has four hundred robots each costing roughly two million pounds. If a part of one of these robots breaks and requires replacement they are forced to go to the manufacturer of the robot. The manufacturer is therefore guaranteed these future maintenance orders for which it can charge excessive prices. However the machinery has added value to the business because it enables Ford to produce more vehicles in a shorter time. Also they enabled Ford to reduce staff numbers. Ford estimates that each robot replaced one and a half humans and the robots are capable of working twenty-four hours a day. Overall this creates an increase in business.

The way that Ford deals with their suppliers is described well in the following paragraph. <sup>(9)</sup> Toyota and Honda, who commit to a group of suppliers in return for ongoing price, quality and time improvements is their performance and Volkswagen and General Motors, who are happy to ditch a supplier if a cheaper or

---

7 <http://www.ecofine.com/strategy/RBV%20of%20the%20firm.htm>  
8 Shapiro and Varian, 1999  
9 E-Business Essentials Mark, P146

more convenient alternative comes along. It should be noted that their partnership option is by no means based on implicit trust. The aim in all cases is to reduce overall cost and, in practice benchmarking is still being carried out and prices are in line with the wider market. Between the poles have (at times) come Ford and Rover. The former has sometimes drifted with no fixed long-term strategy; the latter has been in transition.

This shows that certain manufactures are loyal and stick to certain suppliers to create trust between the two companies. Also some chose to switch as soon as a cheaper supplier comes onto the market. However Ford has chosen to stay in between these two different strategies as was evident on a tour of their factory. It was said that for certain parts such as engines and seating they stick to the same supplier and for components such as bulbs and relays they simply choose the cheapest supplier that can meet the delivery requirement and quality standards.

<sup>(10)</sup> A generic automotive supply chain has for its primary raw material vendors - chemical manufacturers, steel mills, aluminum plants, etc. Secondary raw material vendors are suppliers of accessories, such as nuts, bolts, batteries, and tires, etc. Original equipment manufacturers (OEMs) are engine manufacturers. Automobile manufacturers design, assemble, and market the automobile. Automobile dealers are retailers that consumers visit for buying and servicing their automobiles.

A classic problem encountered by a generic SCN (Supply chain network) is that of planning and co-coordinating SCN production to meet consumer demand while making effective use of resources and promoting co-operation among members to achieve lead-time (waste) reduction. In the automotive industry e.g. dealer to automobile manufacturer, OEM, accessories manufacturer, and raw material vendor relays consumer demand. Similarly, flow of material occurs in transforming - raw material to automotive accessories by the tier-2 manufacturer, original automotive equipment by the OEM or tier-1 manufacturer, a name brand automobile by the automobile manufacturer, and a consumer product by the dealer. The interaction between members occurs as a consumer and a provider. Thus, an automobile manufacturer assumes the role of a provider (of automobiles) in its dealings with a dealer (a consumer of automobiles). However, it acts as a consumer of original equipment while dealing with an OEM (a provider of original equipment). Synchronization of the automotive SCN is achieved through co-ordination, primarily of: (a) replenishment schedules that

---

10 Wendy Currie, Value creation from e-business models, 2004, P339-340.

have been passed on through the echelon, from dealer onwards to automobile manufacturer, OEM, accessories manufacturer, and raw material supplier and (b) commitments made on capacity utilization between various members in the supply chain echelon.

This paragraph tells of other things involved in the construction of vehicles that can be considered a lock-in. Things described as being provided by secondary raw material vendors, such as nuts, bolts, batteries and tires. All these are essential for Ford's product and they do not have a equipment or expertise required to produce them, for this reason the suppliers of these items have Ford in a lock-in situation. In conclusion it is apparent that from the supply chain the entire way through to after sales service there is a large amount of lock-in involved with the company.

### **3.4 Ford Motor Co Efficiency**

The Ford Factory in Eastleigh is set up so that parts go up and down in one continuous line. There was no need for the line to stop unless there is a problem with one of their robots. However on the tour we were told that they are 99.9% accurate and never seem to have a problem. The factory layout is very efficient as the production line doesn't need to stop for a part to be transported to another part of the factory and all the space is being used. They have set places where parts travel behind cages and through walk ways. For example a forklift truck could be traveling walk way and it would have to stop for a part to travel across the ground. Certain parts of the vehicles aren't required until the end of the production line. For example adding wheels, they are sent along a conveyer belt before they are needed and they arrive at the required place just in time (JIT).

**Ref: ( 11 )**

**Just-in-time (JIT)** is defined in the APICS dictionary as "a philosophy of manufacturing based on planned elimination of all waste and on continuous improvement of productivity". It also has been described as an approach with the objective of producing the right part in the right place at the right time (in other words, "just in time").

Ford has made changes to their factory by implementing 400 robots replacing 600 workers. Each robot cost an average of two million pounds meaning they invested a total of eight hundred million pounds. This means that each robot

---

11 <http://personal.ashland.edu/~rjacobs/m503jit.html>

completes the equivalent amount of work as one and a half people per day, however they are able to, if required work twenty four hours a day. They have added value by saving time it takes to build a car and reduce human error.

The company uses Computer Maintenance Management Systems (CMMS) to control business operations ranging from who is working on what day to the payroll. The software controls stock levels and automatically replenishes stock when it's running low. Also stock coming into the factory is monitored and processes using CMMS, this process is automated and eliminates the need of human organisation. Employees have to show how efficient their work is on a day to day basis by filling out efficiency reports. These reports are placed on a notice board along with morale boosting media. The reports are collected by managers on a daily basis and checked to ensure the factory is running smoothly,

The factory produces roughly 365 vans a day and the statistical information relating to the production is shown on large overhead monitors throughout. If the weekly quota isn't met the CMMS puts the factory on overtime to clear the backlog. Reports produced from the CMMS are printed out and distributed to every department relating to health and safety regulations, efficiency and production quotas.

### **3.4 Complementarities**

Complementarity is what a company offers to make deals better e.g. Car hires with RAC cover and free insurance on certain purchases. Complementarities don't just relate to the customer, they can relate to companies and employee's e.g. free health care and bonuses for employees, discount on 2 for 1 on bulk purchases for companies. Complementarities creates customer satisfaction, which is in essence how a value chain works, the more you offer the more you get out of it. The more satisfied people you have the better your custom will be. You have to know who your customer is and what they need, the essence of adding value. The Internet is a great place to do business as transactions can be made anywhere in the world in any language. Most web sites make their money from advertising not the actual product. A key web 2.0 feature is pay per click. When a customer comes to your web site to view your products their bombarded by advertisements, every view or click sends money to the company whose site you're viewing. As XML is being used more and more these days it is also possible to share an e-commerce site to any other service on the net using pure date, it's

up to the end user how they style it. The web is always offering complementarities to buyers, like free delivery or 10% on next online purchase. Using the web is a great means of reaching a wider audience and people with disabilities. Offering these people who wouldn't normally come to your outlet is going to increase your profit margin.

The Ford Company offers discounts on bulk purchases, this is called Fleet purchasing. If the customers know that they can get discount on bulk buy they will come back to the company for more. Customers are able to test-drive any vehicle to see if it meets their needs. Test-driving allows the company to interact with the customer and identify their needs. Creating customised vehicles for customers based on their requirements ensures customer satisfaction. Customer satisfaction is a key component in adding value to a supply chain. For example, when buying a new car, the customer is entitled to free 7-day Drive away cover and discounts on RAC home start and breakdown cover. This complimentary was taken from the Ford web site, so if the company is offering these complementarities it's ensuring customer satisfaction. Value is created through satisfaction and is based upon knowing what the customer wants by giving them more for their money making them spend more.

When Ford buys bulk raw materials from their suppliers, they get discount, as everything is in such large quantity. The Ford Company has 9,000 plus suppliers, having so many suppliers' means more sources of raw materials, entailing more discounts on purchases. This enables them to provide a better service to the customer and apply better offers at the same time. Ford also makes money by working with schools and other sponsorships like football and charities. They have tours around the factory for schools, give promotion products to sponsorships and donate money to charities. This all draws in customers through advertising; it nurtures interest in their products and adds value to their complex supply chain.

#### **4.0 Conclusion**

Four major sources of adding value have been identified during the research of this project and meet the aims and objectives stated before. The four major sources of value adding have been defined in the Amit & Zott value adding model. they are:

- Novelty
- Lock-in
- Complimentarity
- Efficiency

Preliminary research into Fords supply chain pinpointed to a connection between each of the above bullet points, when combined they create value. Value is subjective to experience that is dependent on the context. Value flows from either the person in charge of the raw materials or the customer. Keep this sentence in mind when reading the next paragraph as we discuss novelties connection with efficiency and lock in. Take this scenario as an example, research found that Ford introduced a new system to track parts moving from their supplier to their assembly plant and visa versa. This process increased the efficiency of their supply chain as it provided automated workflow, real time visibility, reduced inventory, and prevented business interruption. This novel idea complimented the efficiency of the assembly process to enable them to make better use of resources, time management, expenditure, and most important a better service to their customers. This adds value to the business end of operations as they are able to produce high quality goods, faster, and cheaper. As the system provides better time management they are able to delegate tasks to different sections creating a more efficient processes as well as new novel value adding schemes.

In essence this new services goal is to motivate customers to engage in repeat transactions and provide a lock in. They get this value from the customer as they are the value flowing link within value chains. One instance where Ford is receiving repeat customer transactions is the personalised vehicles supplied to the RAC. As RAC receives their vehicles from Ford they are in essence locked in with Fords supply chain. Therefore value is added by keeping strong customer bases that supply repeat transactions. Supplying customised vehicles is a novel way to gain more custom, they can provide these cars to RAC cheaply due to the new system mentioned before. RAC are able to purchase in bulk and receive a



discount which is known as fleet purchasing. Fleet purchasing is a complimentary Ford gives to its customers to ensure repeated transactions.

Ford introduces a new idea to increase efficiency with B2B and B2C transactions; the new process enables them to provide better quality goods at a cheaper rate in larger quantity. The product is then marketed to the customer with benefits. These benefits are applied due to the efficient way the product is assembled. The customer becomes apart of the supply chain customer bass and ensures repeat transactions. In essence their supply chain is working around the needs of the customer to cause customer satisfaction and customer satisfaction equals value. This is the essence of what a value chain achieves.

To conclude Ford have added value to their supply chain by using the four steps in the Amit and Zott model, they provide new services that ensure customer satisfaction and repeat transactions. They increase efficiency within production to offer a better deal to their customers as well as minimising cost of production. Each step is defining who the customer is, what they won't, what they value, how much are they willing to pay and give them satisfaction. This satisfaction creates value.

## 5.0 Bibliography

### 5.1 Internet Links

- <http://www.bptrends.com>
- <http://www.rfidjournal.com/article/articleprint/2249/-1/82/>
- <http://www.ford.com>
- <http://www.ecofine.com/strategy/RBV%20of%20the%20firm.htm>
- <http://www.wmep.org/valuechaninmanagement.html>
- <http://www.strtegixsoftware.com/featuresDoc3.asp>
- <http://www.infoloom.com/gcaconfs/WEB/paris2000/S10-04.htm>

### 5.2 Articles

| Name  | Author                         | Published |
|---|--------------------------------|-----------|
| Value Chains VS Supply Chains   | Andrew Feller                  | 2006      |
| M Porter, Competitive Advantage, creating and sustaining superior performance | The Free Press, new York times | 1985      |
| Adding RFID to Ford's Supply Chain  | Terry McInture                 | 2006      |
| Human Chain   | Global Logistics               | 2005      |
| Aftermarket is no longer an afterthought                                      | Robert J. Bowman               | 2004      |
| Road Testing  | Russ Banham                    | 2001      |
| Dell, it turns Out, has a better idea than ford                               | Fred Andrews                   | 2000      |

### 5.3 Books

| Name                                  | Author                     | Publisher | Date |
|---------------------------------------|----------------------------|-----------|------|
| Shapiro and Varian                    | need                       | need      | 1999 |
| Strategic Management                  | John Wiley                 | need      | 2001 |
| E-Business Essentials                 | Mark Norris and Steve West |           | 2001 |
| Value creation from e-business models | Wendy Currie               |           | 2004 |