

Analysis of netflix information systems



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First formed in 1991, Netflix has become today's predominant video rental service. They offer a hybrid service allowing DVD delivery by mail as well as streaming movies and TV shows via their company website or access on 200 other devices. Their unique business process has netted them over 16 million subscribers and revenue around \$500 million annually. The reason for their growing success can be attributed to a good business model and just as important, properly implemented systems.

An extremely efficient supply chain management system (SCM) and customer relationship management system (CRM) have helped Netflix become the world's largest video subscription service. Before looking at the systems that make Netflix's service possible, a brief overview of this service is needed. Subscribers pay monthly based on a tier pricing plan determined by the amount of DVDs that can be rented at a time. The tiers range from \$7.99 for only streaming video, up to \$55.9 for 8 DVDs at one time. It is important to know about this tiered-pricing system and how the amount of DVDs a subscriber can have at a time varies amongst their 16 million customers. Without an effective SCM system they would not be able to keep up with the always varying amount of DVDs being mailed out at a time. With millions of customers requesting various amounts of DVDs to be shipped to them every minute of the day, how can Netflix keep its inventory moving fast enough to earn a profit?

According to Tom Dillon, Netflix COO, "the way you get more competitive, lower your costs, and provide better service is through continuous improvement of the information technology". Dillon oversees the DVD fulfillment and believes that the source of the company's competitive

advantage is their investment in proprietary inventory management software. Originally using an Oracle ERP system, still used now only for financial information, Dillon felt that the system was “ too big and bulky and was hindering innovation” in shipping DVDs.

To improve this operation Netflix decided to write its own system (InfoWorld). Netflix had to design a new system that allowed their 37 shipping centers to process 1.3 million movies per day for one-day delivery. DVDs arrive back to the warehouses every morning and it is crucial to have a quick turnaround in order to satisfy customers and post office deadlines. The SCM they created runs supply-and-demand algorithms that take the information the company has, such as, who is owed a movie and what movies are available, and computes the 1. million daily orders in less than 25 minutes (InfoWorld). So how effective is the new proprietary SCM software at improving the DVD shipping process? Before the new software was implemented, staff at the distribution centers did the following with all of the hundreds of thousands of movies that would arrive daily; the clerk would pick up a box from a pallet, locate the paperwork, and match that box with the purchase order. With the implementation of the new system, the clerk’s job has gotten a lot less time consuming and therefore more cost effective.

Now the staff checks the disk sleeve to make sure it is the proper movie and scans the serial number. Netflix’s software takes over from here, considering the total inventory of that film, how many customer wish lists it appears on, and several other factors. The software then decides if this film needs to be shipped back out, placed in inventory, or retired due to lack of demand. The

company is now able to check in a DVD and ship it back out same-day more than 90% of the time, as to 75% of the time with their old system (Stevens).

The system does not just decide where a DVD is going, it decides what DVD that customer actually wants to receive next. Since Netflix customers request their DVDs using a queue system, the software needs to decide what movie in that particular customer's queue it is able to get to them the fastest. This may not always be the customer's first choice but the one that is able to be re-shipped that day. For example, if a customer in NYC places an order, they will be assigned to the closest distribution center, for that location it would be Flushing, NY.

If the first DVD in their queue is not available at this location it will check the next closest center, Stamford, CT. If that center does not have it as well, the system works down the distribution center list until the DVD is located. If the DVD is not available from any center at that time, the software checks the next movie in that customer's queue and restarts the process. Even if the DVD ends up being sent from the Netflix main library in San Jose, CA, the system will print a return shipping label for the closest distribution center to the customer in order to minimize return-mail times (Cohen).

A quick review of the process shows us that Netflix's proprietary SCM software decides what movies are to be sent and where they are going to be sent to. How does this system add value to the company and is it necessary for them to operate? Well it starts adding value initially by reducing costs.

When the company first started it had around 75, 000 customers but required over 100 employees per distribution center in order to insure quick

turnaround. Now with a customer base in the millions, distribution centers average around 45 employees (Cohen).

This is due to the software allowing a lesser amount of people to handle a larger work load. According to Tom Dillon, lower costs translate to competitive advantage, and this is important to have in a \$66 billion dollar a year industry. Dillon estimates that the company's distribution cost are about half of what Blockbuster was spending. " Every penny counts in a high-volume business," Dillon said, which shows its truth after Netflix became one of the leading factors in Blockbuster filing for bankruptcy (InfoWorld).

Having lower distribution costs allowed Netflix to charge their customers a lower subscription fee. The ability to ship out a varying amount of DVDs also allowed them to offer customers many different options in what they wanted their subscription to entitle, while Blockbuster only offered its customers 1 or 3 DVDs at a time (Cohen). If Netflix never decided to take the risk and ditch the Oracle system to develop their own SCM software, they would not have been able to keep up with customer-base growth and most likely would not be the industry giant they are today.

By cutting costs, their competitive advantage grew so great they forced the former industry leader into bankruptcy and changed video rental services forever. There's no question that their SCM system is the reason for all their success. Tom Dillon would agree, once saying, " IT is not a strategic weapon in most companies, but in our company, IT is the business". While their SCM system gets the DVDs quickly to and from customers, Netflix uses a CRM system to assist customers in placing orders. Customer relationship

management systems analyze customer behavior through orders in attempt to predetermine their needs and wants.

This information is stored in a data warehouse where it is further analyzed by the system. The goal of this system is to provide an increased positive experience for the customer, which in-turn will keep them subscribing to the service month after month. In order to accomplish this goal Netflix again decided to create its own software for the system. CineMatch is what they came up with, an oracle database that organizes the entire Netflix library into groups of similar movies. On the company's website, customers are able to rate movies that they have rented.

CineMatch looks at the groups of movies you have rented from; looks at films you haven't rented yet, and then recommend films based off of ratings you have given previous rentals. It also offers to group you with other members that it decides have similar movie taste. The whole idea of this software is to keep the customer finding new films that they are interested in renting (Cohen). The CRM system, CineMatch, runs off of two Sun 420 systems. It is able to generate thousands of predictions a second. The software works with a database of more than 200 million user ratings and 15, 000 films stored on a third system.

Neil Hunt, Netflix's VP of e-commerce, says, " The more data we collect about user preferences, the better the recommendations". Currently this system is 75% accurate with the recommendations it makes, the company hopes its continued work with it will earn them at least 10% more accuracy (Wilson). To achieve this accuracy a deeper look into how CineMatch actually

works is needed. This type of software is known as a collaborative filtering system. A statistical process called, multivariate regression, determines which other movies you are most likely to like.

For example, an algorithm begins by matching movies to each other, it looks at people who rated movie A and determines which of those people gave a similar rating to movie B. The statistical likelihood that people who liked movie A also liked movie B is calculated. The process is continued until a pattern between ratings and films is determined and a recommendation is returned. The whole time the database constantly updates itself with new found patterns in order to learn how people watch movies (Wilson).

Now that the CRM has been defined and its process explained, an understanding of how it adds value to the company can be reached. Its main purpose is simple, keep customers renting films in order to keep them paying monthly. If a customer is only renting one or two films a month, they may not see it as a service worth continued pay. Netflix CEO, Reed Hastings, says the average customer rents five films a month and the technology is to owe for this figure (Cohen). 60% of subscribers add films recommended by CineMatch to their delivery queue (Wilson).

By emplacing a system that gives effective results, Netflix is able to maintain their customer base and continue to turn profits. If customers were left in the dark, simply choosing movies recommended by word of mouth with little other guidance, it is likely they would unsubscribe after only a few months leaving Netflix with a library full of films and no one wanting to watch them. In conclusion, Netflix utilizes many systems in order to maintain business;

the most important being their SCM to give customers a speedy turnaround, and a CRM to keep customers requesting new films for delivery.

Without the highly efficient SCM system they would likely have to shut their doors after losing customer subscriptions due to lengthy delivery times. Not having an effective CRM would mean that customers would run out of films they desire to see and therefore no longer need to pay monthly for a service that does not offer them something in return. In a world where people want things in an instant and their wants constantly change, Netflix has found the perfection combination of information systems to make their company the most successful in the industry as well as change the way the industry operates completely.