

NetFlix

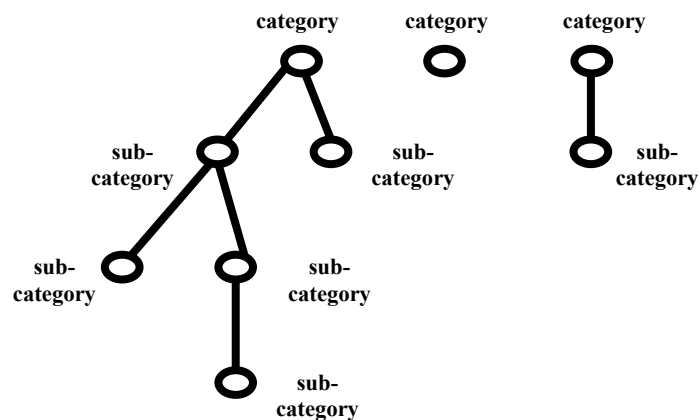
NetFlix (NF) has created a unique and extremely successful business model in the “movie rental” industry. Customers select movies through the Internet and then get their videos (DVD’s) shipped at home. NF’s overwhelming success requires a world class database and they ask for your help. They would like to start with an improved system for their **revenue** activities. I interviewed Reed Hastings (RH), NF’s CEO. Please use the information provided by RH (see below) to define an Entity-Relationship (E-R) model.

Q. How do you generate revenue (answer with one sentence)?

RH. We rent DVD’s to customers for a fee. We also sell DVD’s – the ones we own and we can’t rent any longer. Note: DVD, copy, and video all refer to the same thing.

Q. What information would you like to record regarding movies?

RH. We actually don’t use the term movie at NF (too limited). We use the term title instead. We currently have more than 100,000 titles on our website from which customers can choose. One of our strengths is that we offer relatively unknown titles including documentaries and foreign films. We are able to do that since we lease most movies from the studios instead of purchasing them; i.e. we lease a DVD from a studio when a customer requests it. For example, we offer the title “Karakter” (a foreign film) for more than two years but it has not been requested yet. We don’t have a copy of it and no investment is required! We record the following information for each title: code, name, and description. We record at least one category for each title. Examples of categories include: action, biography, comedy, crime, documentary, drama, family, foreign, history, musical, mystery, romance, sitcom, soap, sport, thriller, war, and western. A category often has subcategories. For example, for history we have modern and roman history subcategories, and for biography we have entertainment, politics, etc. Not all categories have sub-categories. The diagram below shows how the structure of our classification system (for categories) looks like. There is at most one (parent) category for each (child) subcategory (i.e., we have a hierarchical classification system). The following categories are defined for the title “Spartacus”: roman history, drama, and action. On the other hand, the following categories are defined for the title “Gladiator”: roman history and action. Only categories (including subcategories) are recorded for which we offer at least one title. We record exactly one title for each DVD.



Let’s talk about the business model itself. Do all customers get the same deal?

RH. Well, not really. Customers can choose between 5 different plans. Here is a summary of the different plans.

Name	Number of DVD's	Rentals/Month	Price/Month	Free Trial Length
D(iamond)	4 DVDs at-a-time	Unlimited	\$23.99	2 weeks
G(old)	3 DVDs at-a-time	Unlimited	\$17.99	2 weeks
(S)ilver	2 DVDs at-a-time	Unlimited	\$14.99	2 weeks
B(asic)	1 DVD at-a-time	Unlimited	\$9.99	2 weeks
E(ntry)	1 DVD at-a-time	Limit 2 per month	\$4.99	2 weeks

Customers change plans over time. They often start with plan E and then move to plan G within a couple of weeks. G is our most popular plan with more than 250,000 customers. We track a customer's history; i.e., we keep track of all the different plans the customer participated in. We record the start-date and end-date for each plan. We record plan information when the customer enrolls for the first time. We keep information for customers that cancel their subscription; we consider them as inactive (and they actually often subscribe again at a later time). Last year we tried the "Junkie" plan where customers were able to sign up for 10 DVDs at a time for \$49.99 a month. No customer ever signed up !

What happens next (after customers have enrolled)?

RH. Customers use our web site to record their "favorite categories" as well as their "rental queue." Customers can select any number of categories as their favorite categories. Most customers select two or three categories, some select more, some select none. Comedy is currently the most popular category (more than a 300,000 customers). Nobody has selected 'political documentaries' as their favorite category yet. The rental queue defines the specific titles a customer would like to rent in order of preference (sequence). Customers can put an unlimited number of titles in their queue. A title is removed from the customer's queue once it is shipped (to the customer). Customers are sent an e-mail when their queue is empty to let them know that no video can be shipped. More than 100,000 customers had "Dreamgirls" (title) in their rental queue last week. It takes most customers at least a couple of days to create their first rental queue (after enrollment). Using favorite categories, rental queue, and rental history information, we also generate (and record) a list of (individualized) suggestions for each customer – movies they have not requested yet and they might be interested in. Our goal is to have at least 3 suggestions in each customer's "suggestion list." We usually record our first suggestions one week after a customer enrolls. We have thousands of movies that we have never used as a suggestion. We currently have "Grease" (title) as a suggestion for more than 10,000 customers.

Tell me more about the rentals/shipments¹?

RH. When a customer returns a DVD, we immediately ship the next item in her rental queue (if available and permitted by the plan). We ship videos (DVD's) separately; i.e., there is exactly one DVD per shipment. Information recorded for a shipment includes: when was the item shipped, who was it shipped to (customer), and when was it returned. We record exactly one customer per shipment. The following information is recorded for each DVD: id and date-of-

¹ RH told us that, for NF, rental and shipment are the same thing.

acquisition. The same video can be rented many times. We either purchase or lease our videos. We prefer leasing over purchasing since purchasing: (1) is more risky: we might not be able to rent the DVD, and (2) is more costly: we have to store the DVD's while not rented. For example, we bought a number of copies of the documentary "How to teach accounting students cardinalities." No one has requested this title yet.

What about payments?

RH. A customer pays at the beginning of each month independent of how many movies we ship to her during a month (more like a prepayment). We want to trace each rental (shipment) to a payment. We record exactly one payment for each rental (shipment).

Do you have any other sources of revenue?

RH. We actually do. We often buy a large number of videos of a new release and we sell most of them after one year. Customers can buy videos by placing an order on our web site (the order is then recorded in our database). There is at least one video per order. Obviously, a video can be ordered (and sold) only once. We don't really differentiate between (sales) orders and (sales) shipments. Stated differently, for NF "sales orders" and "sales shipments" are the same thing. Once shipped (and thus sold) we record a shipment date for the order (indicating that the order has been shipped). There is exactly one customer per (sales) order. Most of our customers don't buy (order) DVD's; they only rent. However, some customers place (sales) orders more than twice a month. A few customers have only bought DVD's; i.e., they don't rent DVD's. Customers are asked to pay within 30 days (starting from the shipment date). We accept installments. Often, customers pay for a number of (sales) orders with one check.

What information do you record for payments?

RH. Exactly one account is recorded for each payment. We currently have an account for which there are no cash receipts yet.

List of attributes.

Title-code	Customer-Plan-end-date
CashReceipt-code	Customer-code
Cash-#	Order-shipment-date
DVD-id	Plan-free-trial-length
Rent-#	Title-description
Order-#	Rent-return-date
CashReceipt-date	CashReceipt-amount
Customer-Plan-start-date	Rent-shipment-date
Category-code	DVD-acquisition-date
Order-date	Plan-number-of-dvds
Customer-name	Plan-price-per-month
Title-Customer-sequence	Customer-address
Title-name	Cash-balance
Plan-name	Category-description
Plan-rentals-per-month	

ASSIGNMENT

- **DRAW AN E-R DIAGRAM**
- **Note: Draw the relationship attributes
Do NOT draw the entity attributes**