



Redesigning the Netflix Recommendation System

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Final Project

Introduction

Netflix

- Netflix is a movie recommendation system which allows the user to rent movies of their tastes.
- Whenever the user selects a movie, the user interface provides more detailed information about the movie and puts that movie on the rental queue.
- The Netflix system then picks the movies from the queue based on the order assigned to them and delivers them in about one business day.
- The user interface also allows the user to rate the movies in terms of five stars. Netflix uses a movie recommendation system (Cinematch) which takes into account the ratings of the users and their rental items

Proposed System

- The proposed system aims to provide cooler and flexible user interface with better visibility and mapping.
- This user interface provides better rating and recommendation system which takes genre, demographics, MPAA ratings, rank and rented items into account.









How Netflix works

- **Netflix** is an online subscription movie rental service.
- Customers are allowed to access a huge library of motion picture, television and other filmed entertainment.
- As the user selects the movies they are added to his rental queue which latter can be adjusted anytime by the user by clicking the “Queue” tab.
- Netflix decides which movies to send based on the movies in the rental queue, and the current availability of those in its library.
- The selected movies are sent in about one business day.



Netflix Benefits

- It provides a cool user interface which is easy to use and explore. It has a built in wide and shallow structure to provide a variety of movies, television shows etc.
- Rating system- It uses five stars for rating. Rating system is easy, fast and has better visibility. It saves the rating without reloading the current page.
- There is no concept of due date in this system. The user can keep the DVDs as long as he wants.
- It provides reviews of movies, shows and reviews of the current critics in the country.

		Sort By	Title	MPAA	Star Rating ▾
 Add	Lucky Number Slevin  <input type="button" value="Not Interested"/>	Add	National Treasure (2004) Top 100	PG	
		Add	Sneakers (1992)	PG-13	
		Add	Touch of Evil (1958)	PG-13	
		Add	The Bone Collector (1999)	R	
		Add	The Crow (1994)	R	
		Add	Deliverance (1972)	R	

-
- Netflix has a good feedback system. It sends a message to the user whenever the shipping of the DVDs is made.
 - Netflix keeps a good history of the customers and provides the details such of rental queue, DVDs returned, Favorite Genres etc.
 - The user can view and change the rental queue anytime.

Netflix Drawbacks

- Netflix shows the same list of movies in their respective categories which sometimes bug the users whenever they logged on to the site.
- The recommendation system (Cinematch) used by the Netflix to recommend movies to the users is not that accurate.
- Sometimes the rentals are not delivered in the order specified by the user.

Related Systems

Pandora

- Pandora is an internet radio service that helps internet users to find new music based on your old and current favorites.
- Pandora's GUI
 - Simple
 - Uses the metaphor of a real radio, this helps the user do a natural mapping of the controls.

Pandora's Rating System

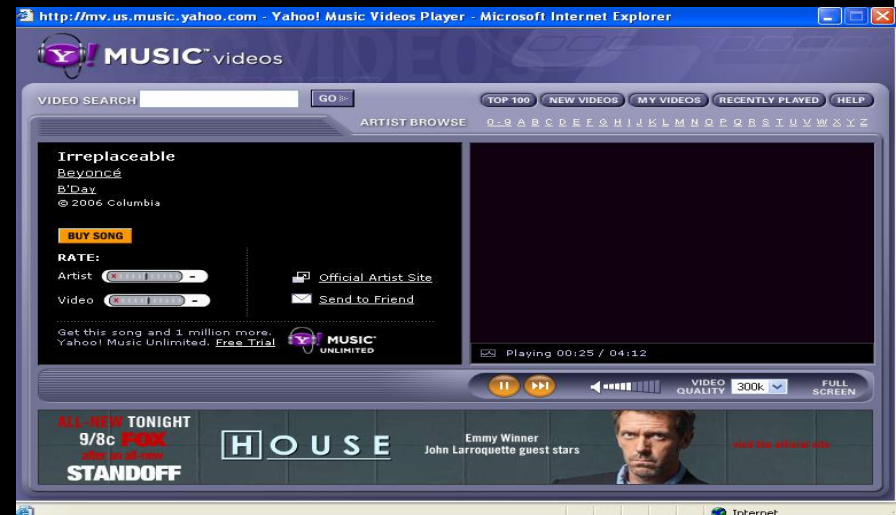
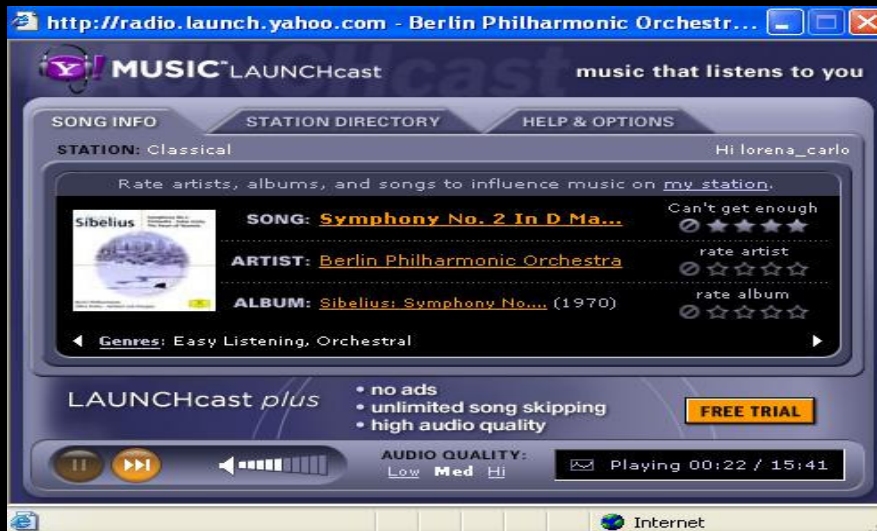
- Pandora provides the “Thumbs Up” and “Thumbs Down” options for rating.
 - These options are not visible for the user.
 - Feedback is provided to the user.
 - Users know what option they are picking.
 - A small explanation of what thumbs up and thumbs down means is provided to the user.
- A natural mapping is provided.
 - Thumbs up - agreement
 - Thumbs down - disagreement



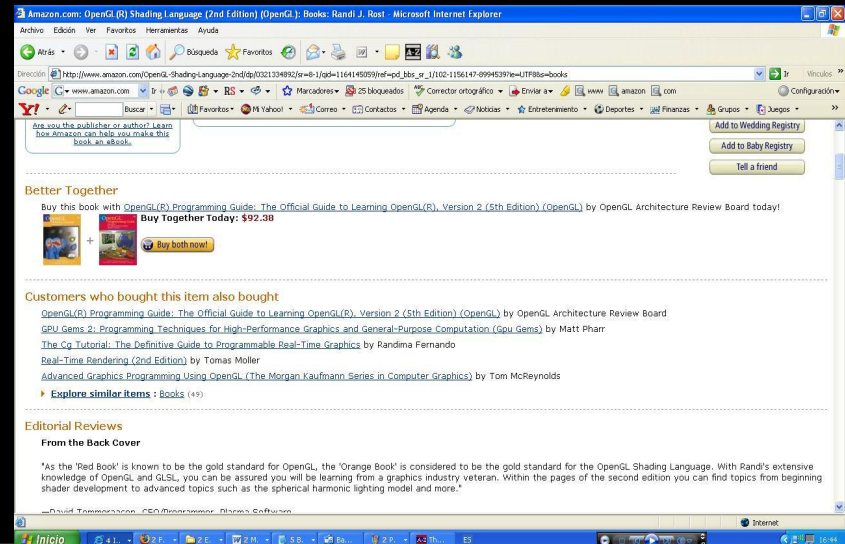
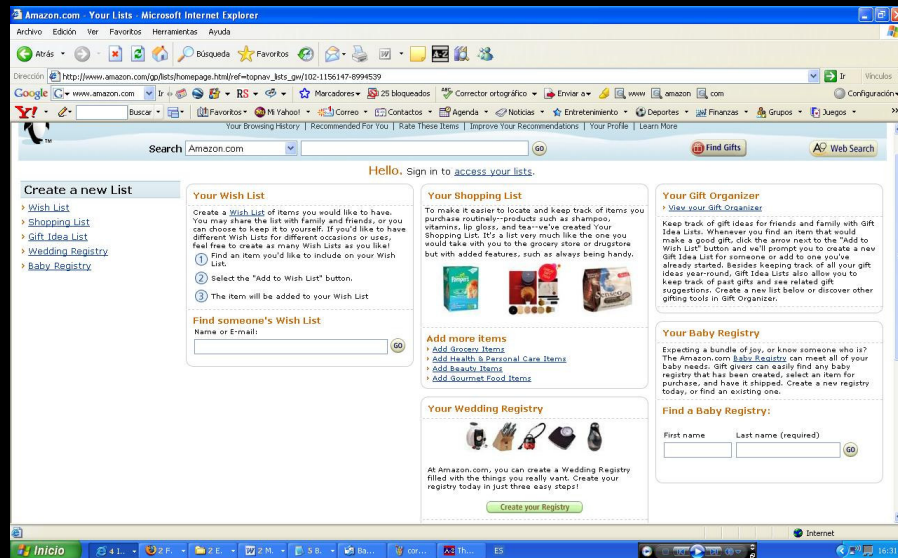
Yahoo Music

- Yahoo music is an internet radio station similar to Pandora. You can create and customize radio stations. You can choose between different music genres, and singers.
- This internet radio has two different rating systems:
 - Simple Rating: Do not play again, its ok, Like it, Can't get enough.
 - Natural mapping
 - Standard for rating movies and songs.
 - Advanced Rating: Range from 1 to 100.
 - More flexibility.

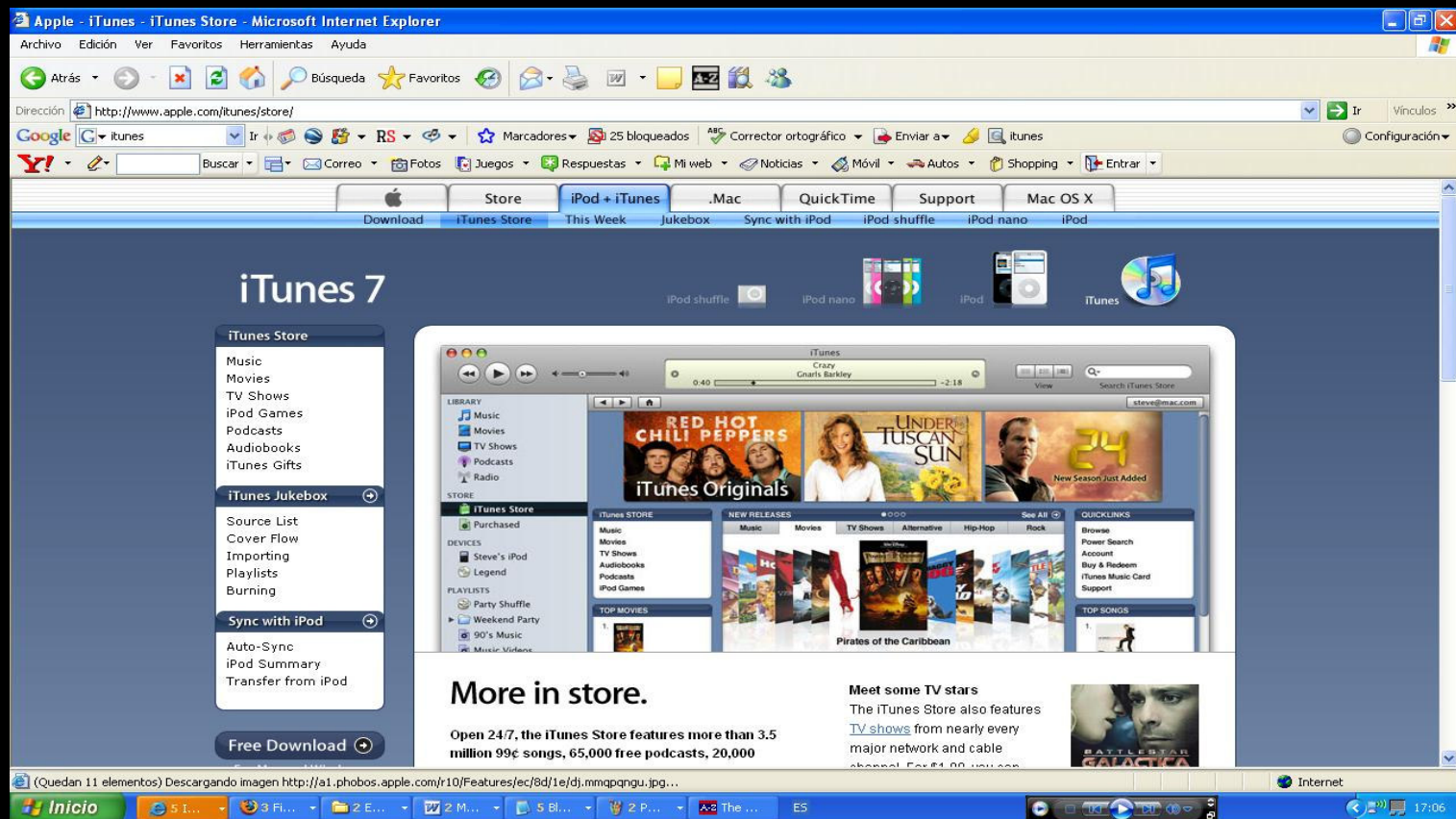
Yahoo Music



Amazon



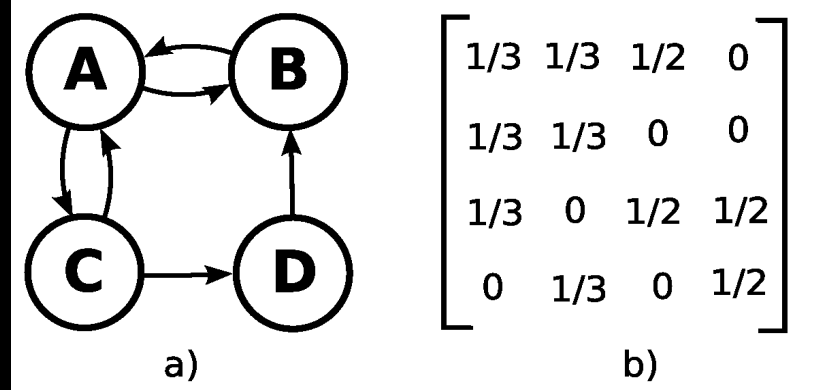
iTunes



Internals of a Recommendation System

How it works

- Markov Chains
 - Google (The Anatomy of a Large-Scale Hypertextual Web Search Engine, Brin et al. 98)
 - Oakland A's (Money Ball, the Art of Winning an Unfair Game, Michael Lewis)
- Conditional Probability
 - $\Pr(A) \mid \Pr(B)$
- PageRank



How it works

- Recommendations
 - $PR(A) | PR(B)$
 - Eg., If I liked:
 - what are the chances I will like:
- Incorporating additional information
 - $W1*Rank1 + W2*Rank2 \dots$
 - Eg., $0.8*Ratings + 0.2*Demographics$

Improving Netflix

High Level Improvements

- Create a Demographic Profile
 - Currently Available Information
 - High Level User Input
- Referrals Based on Similar Demographic Profiles

Demographic Profile

■ Currently Available Information

- Gender

- Marital Status

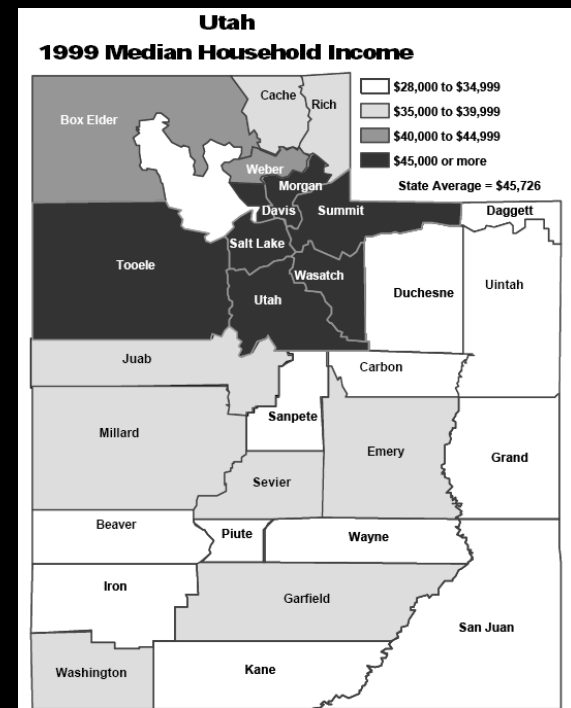
- Age

- Location

- Browsing Behaviors

- Rental History

■ Demographic Profile is “Most Probable”

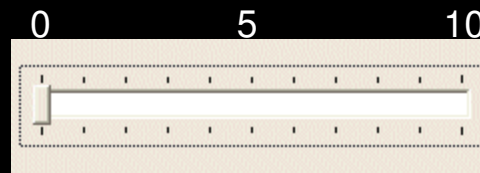


Source: U.S. Census Bureau. Census 2000 Summary File 3.

Demographic Profile

- High Level User Input

- Rental Rating



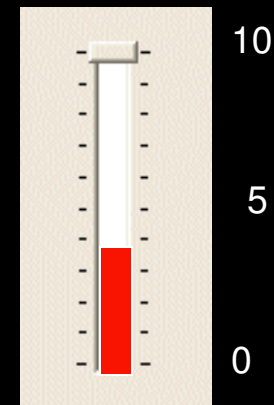
- Referral Constraints

- MPAA Rating

- Genre

- Rental Rating

- Natural Mapping



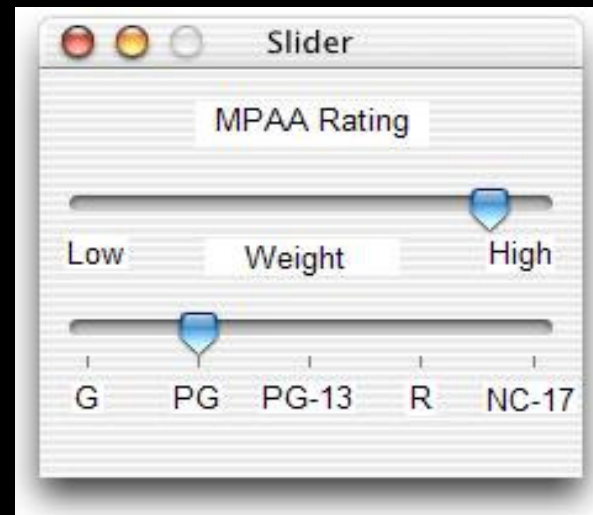
Low -level Preference Tuning

The Short List

Advanced preference areas

- Content rating
- Directors
- Actors
- Specific genres
- Demographics

Slider Control



The Short List

- List boxes
 - Content ratings
 - Actors
 - Directors
 - Specific Genres
- Demographics
 - Artificial Intelligence
 - Personalized
 - Optional

Ratings Content List box

Please exclude the following content from my rental suggestions:

- ☐ Strong adult language
- ☒ Strong sexuality
- ☐ Graphic violence
- ☒ Nudity
- ☒ Gore
- ☐ Drug use

Conclusions

Did we make Netflix better?

- Design Principles
 - Mapping understood concepts
 - Keeping decisions narrow
 - Allowing technophiles to go deeper
- Justified Enhancements
 - Customers like flexibility (Low cost of compliance)
 - Customers are understood more deeply (AI)
 - Enhanced user feedback (You get what you asked for)

Any Questions?

