



NETFLIX CASE STUDY

HOW NETFLIX USES ANALYTICS TO LEAD THE STREAMING ERA

CASE IN 90 SECONDS

1 Context

- Founded in 1998, Netflix disrupted the U.S. video rental industry dominated by Blockbuster by introducing a DVD-by-mail subscription model with no late fees.
- By 2009–2010, Netflix faced new threats from **Video on Demand (VOD)** competitors like Amazon, Apple, and Hulu

2 Netflix's Engine

Subscription (no due dates) + **Cinematch** personalization;
~60% of queued movies come from recommendations.

3 CEO's Dilemma?

How should Netflix transition from a profitable DVD-by-mail model into the emerging VOD market while maintaining its competitive advantage against well-resourced tech and media giants

4 Key Stakeholder

- Reed Hastings (CEO)
- Netflix executive team (Marketing, Operations, R&D)
- Customers (diverse viewing preferences)
- Content providers & hardware/device partners

TIMELINE OF KEY EVENTS



1998

Netflix founded;
pay-per-rent.

1

1999

Subscription + no late
fees introduced.

2

2005

Wal-Mart exits rental
market, partners with
Netflix.

3

2006

Netflix Prize launched
to improve
recommendation
accuracy by 10%.

4

2007

"Watch Instantly" VOD
introduced.

5

2008–09

Partnerships with
Xbox, LG, Vizio; Roku
device launched.

6

2010

Blockbuster filed for
bankruptcy

7

2010 - Onwards

Netflix became the
largest online video
subscription services
in the US.

- clung to a store-based, late-fee-driven model
- reacted too slowly to Netflix's subscription and streaming innovations
- executed costly, poorly designed countermeasures that alienated customers and drained resource



STATISTICAL APPLICATIONS

1. Customer Segmentation

Divided customers into groups by convenience seekers, movie buffs, and bargain hunters to tailor retention strategies

2. Inventory Forecast

Lowered stocks maintain and cutted down cost from U.S Postal Service long-term contract

3. Data Mining

Helped decide the budget for the movie acquisition, improved profit margin

4. Cinematch Recommendation Engine

Used regression tools to evaluate movie and customer factors, got 60% of queued titles coming from recommendations.

5. Netflix Prize

Public contest to beat Cinematch's RMSE by $\geq 10\%$

NETFLIX PRIZE: IMPROVING



R² Target: CINEMATCH

Reduce by $\geq 10\%$ for \$1M prize.

Business Impact:

Lower RMSE = Better predictions = More relevant content

RMSE Formula:

$$RMSE = \sqrt{\frac{\sum_{i=1}^n (y_i - \hat{y}_i)^2}{n}}$$

- y_i = actual rating
- \hat{y}_i = predicted rating
- Lower RMSE \rightarrow better accuracy

Process:

- Training set \rightarrow Probe set \rightarrow Quiz sets (daily) \rightarrow Test set (final).

NETFLIX PRICE LEADERBOARD, MAY 2009

Rank	Team Name	Best Score	% Improvement	Last Submit Time
No Grand Prize candidates yet				
1	PraqmaticTheory	0.8587	9.74	2009-05-29 22:31:15
2	BellKor in BigChaos	0.8590	9.71	2009-05-13 08:14:09
3	Grand Prize Team	0.8597	9.64	2009-05-08 14:10:33
4	Dace	0.8604	9.56	2009-04-22 05:57:03
5	BigChaos	0.8613	9.47	2009-05-09 21:06:09
Grand Prize - RMSE <= 0.8563				
6	BellKor	0.8621	9.39	2009-05-10 09:39:48
7	Gravity	0.8634	9.25	2009-04-22 18:31:32
8	Opera Solutions	0.8641	9.18	2009-05-22 18:54:32
Progress Prize 2008 - RMSE = 0.8616 - Winning Team: BellKor in BigChaos				

PROBLEMS - 2010



1

Customer preferences

Physical film is growing but digital rental markets are growing bigger.

From Blockbuster's annual report 2007-2008:

- Decrease in in-store rental revenue -6.7%
- Increase in Physical film revenue 1.2%
- Increase in Digital Film Rental 25.2%

2

Bandwidth constraints

- Median ~2.3 Mbps in 2008; ~15% on dial-up)

Resolution	Minimum Internet Speed	Remark
480p	3 Mbps	480p DVD quality
720p	5 Mbps	720p HD Blu-ray rip
1080p	8 Mbps	1080p Full HD Blu-ray rip

BANDWIDTH CONSTRAINT - 2010



Video on Demand Value Chain

Internet Speed in US

- Projection mean Internet speed 34.4 Mbps in 2018.
- 4% adopters of fiber optic internet (19.7 Mbps) in 2009.
- ~50% Dial-up decrease every 3 years.

*FCC Broadband Performance Paper

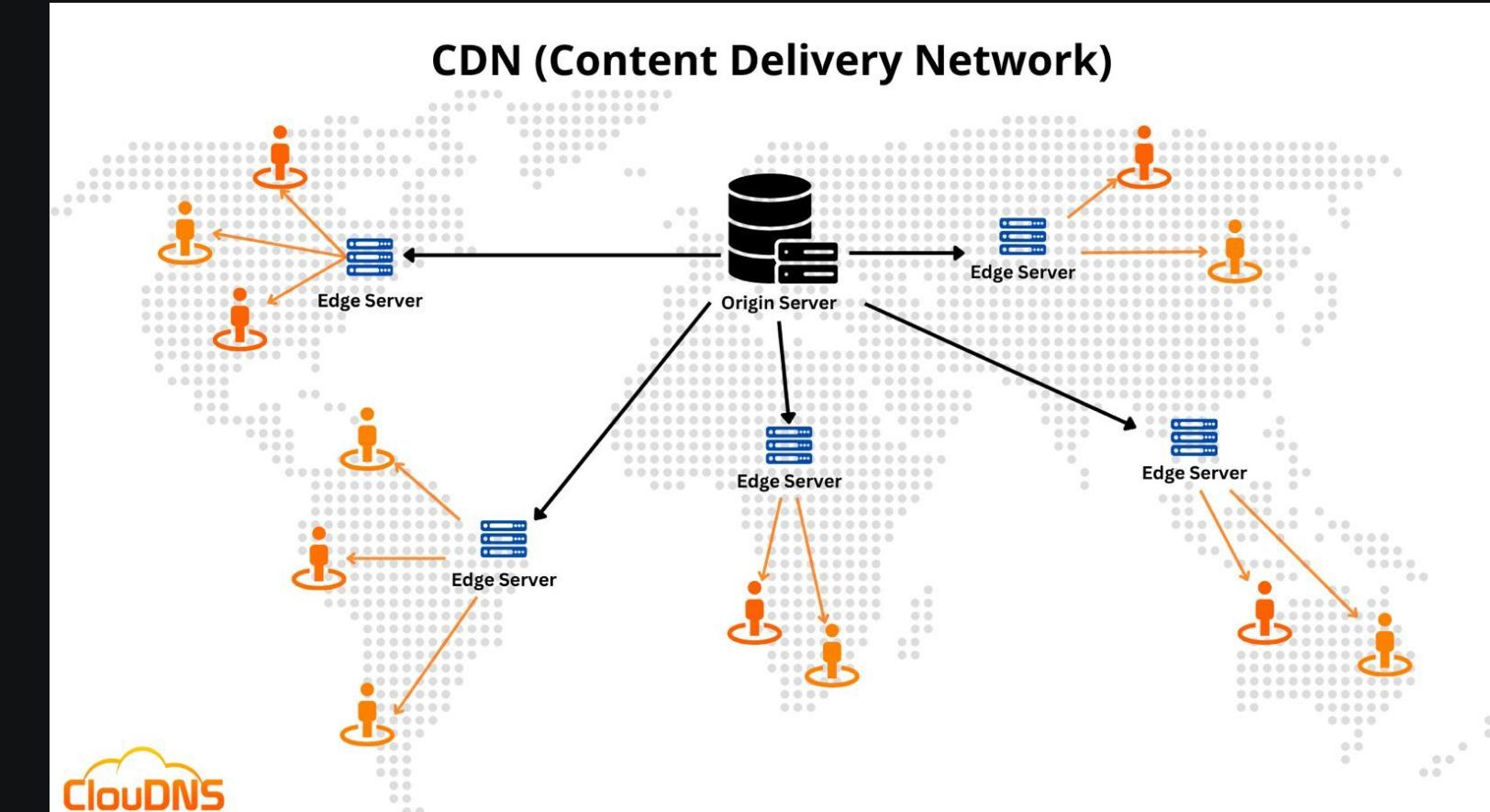
Internet User

- 35% increase in internet user percentage in US between 1999 and 2009.
- 9% increase in internet user of the world between 2005 and 2009.

*Worldbank Internet usage %population

CONTENT DISTRIBUTION

- Hardware-based distributors (Cable, VUDU)
- Internet-based distributors (Amazon, Apple, Hulu)



Use existing customer location data and make projections for future customer before putting any CDN.

HOW CAN NETFLIX COMPETE IN 2010?

1 Continue Investing in Cinematch

- Adopt cross analysis with subscription renewal, promote effectiveness of recommendation algorithm, link algorithm to business growth.

2 Scenario-based VOD Market Forecasting & Penetration Simulation

- Use scenario analysis to project 1–3 year VOD global market growth by combining early-stage adoption data with macro indicators. Model multiple situations to guide expansion strategies.

3 A/B Testing for VOD satisfaction and pricing strategy

- Test enhanced VOD offerings on select user groups to measure impact and appropriate price before scaling.



SHOULD NETFLIX CONTINUE

TO INVEST IN CINEMATCH IN

Sign In

My Feed

Edition: Singapore ▾

For All

Latest News

Singapore

Asia

East Asia

Commentary

Insider

TODAY

Lifestyle

Watch

Listen

All ▾

Commentary

Commentary: Netflix just raised prices again, but how long can it keep doing so?

As purse strings everywhere tighten, why does the streamer appear confident that millions will swallow its latest price hike? Media and tech veteran Ian Tan weighs in.

*Prices of Netflix had increased by 77% from 2016 to 2025

Source: Channel News Asia, 2025

NETFLIX

Introduction

Statistical Application

Problem & Solution

What's Next?

PRICES OF VOD SERVICES IN SINGAPORE



No.	Service	Plan	Price per month (\$)
1	Netflix	4K, 4 screens	29.98
2	Disney+	4K, 4 screens	18.98
3	Amazon Prime Video	- 4K, 3 screens - Includes other services such as Amazon Fresh & Prime Gaming	4.99
4	Apple TV+	4K, 6 screens	13.98
5	Max	- 4K, 4 screens - Available via Singtel & Starhub too	18.98
6	Viu	- 1080p, 5 screens - Available via Singtel & Starhub too	10.98

Highest priced in Singapore \$\$\$

Source: Netflix, Disney, Amazon, Apple, Max, Viu, Singtel, Starhub

“Are consumers willing to pay a premium for personalized recommendations?”





INCREASE IN OPERATING COSTS

"We offer a range of prices and plans to meet a variety of needs, and as we deliver more value to our members, we occasionally ask them to pay a bit more." - Netflix

Source: Channel News Asia, 2025

From 2023 to 2024:

- + 9% increase in sales and marketing cost (compete against other big players)
- + 9% increase in technology & development cost (improving their personalization engine)

Source: Netflix, 2024

CINEMATCH (2025)



YUMMY BITES



THE CHEF



HELL ON EARTH



THEY'RE ALIVE

Cinematch

- 2009: 60% of queued movies came from recommendations
- Today, this number has increased to about 80%

Question:

1. Does better recommendation accuracy actually increase engagement?



H_0 : No causal impact

H_1 : Improving recommendation accuracy causes higher engagement and reduces churn.

HYPOTHESIS TESTING

What to measure

- Leading indicator: Click-through rate for recommended movies
- Hours viewed per member
- Movie completion rate
- Monthly churn

How to test

- Who: Random 50/50 split of members (new and existing)
- What:
 - Control: Current Cinematch algorithm
 - Variant: Improved Cinematch algorithm
- When: 12 weeks



RESULTS & NEXT STEPS

1

If H_1 is True

- Continue investing in Cinematch algorithm development
- Personalisation can be a competitive differentiation
- Use better recommendations to inform which genres/titles to license or produce

2

If H_1 is False

- Reduce investment in Cinematch improvements
- Reallocate budget towards competitive pricing
- Invest in exclusive IP rights & franchise expansions



CONCLUSION

1 Past

Statistics and data analytics made Netflix unbeatable in the DVD era.

2 Present

Statistics and data analytics is timeless.

3 Future

Advanced analytics & ML can preserve Netflix's lead in an increasingly competitive VOD market.



THANK YOU