FC BARCELONA

A Simplified Approach To Building a Video Recommendation System on FC Barcelona's App

Authors

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AGENDA

1. Business Context – What is Barça TV+?
2. Problem and Scope
3. Solution
4. Results
5. Future lines of work

1 | BUSINESS CONTEXT – WHAT IS BARÇA TV+?

Barça TV+ is the club's streaming content platform, under a subscription model, with more than 3,000 videos and 1,000 hours of content available globally through the website and the app, in Catalan, Spanish and English.

Barça TV+

Content

- Documentaries and series
- Match replays and highlights
- Livestreams and Live TV
- Exclusive player content
- Full played games
- News
- Interviews

Devices

- Mobile
- Tablet
- Desktop

Tiers

App Users Path to Barça TV+

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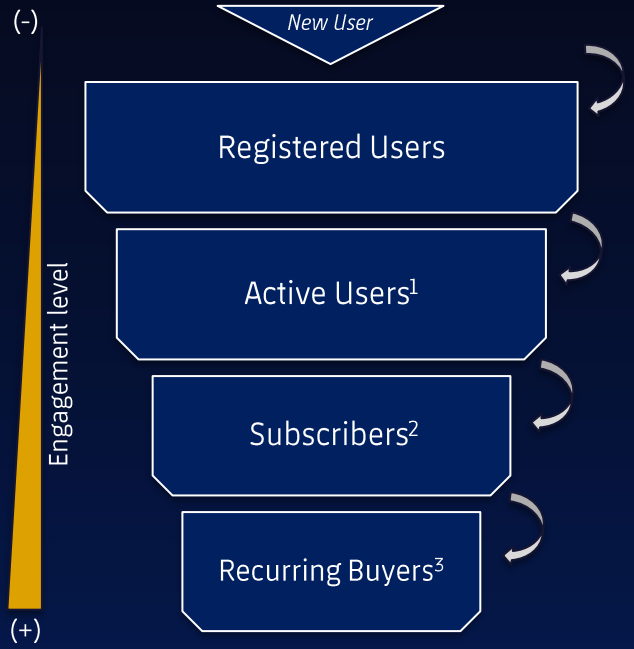
2 | PROBLEM STATEMENT AND PROJECT SCOPE

BarçaTV+ seeks to maximize the time of video consumption, the engagement rates and the recurrence of its users, in order to monetize the platform and generate a sustainable source of income. By funnel step:

Barça TV+ User Funnel



Platform Objective

1. Acquiring new users to the platform through branding and performance marketing
2. Activation of new and registered users
3. Increase the retention of fans subscribed to the platform
4. Increase average ticket value through up-selling and cross-selling initiatives

PROJECT SCOPE

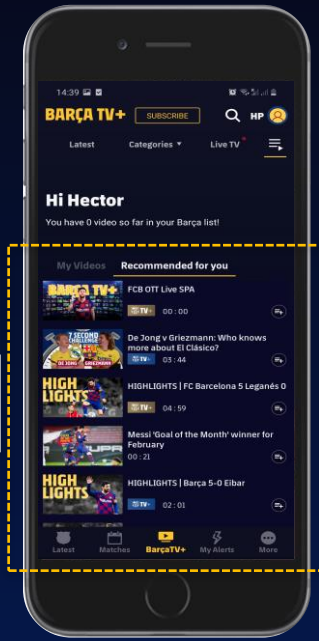
[1] Number of unique users that access the platform at least 1x per month; [2] Number of users who have any of the contracted membership plans other than Freemium; [3] Number of users who made at least 1 purchase in the last 6 months.

2 | PROBLEM STATEMENT AND PROJECT SCOPE

In order to increase the activation of new and registered users on the platform, as well as the retention of subscribers, this project proposes an approach to building a video recommendation system that helps those objectives.

Recommended For You Screen

Recommended For You



Project Metrics

Recommender System

***Objective Key Results* (OKR's)**

	1. *Engagement*	2. Loyalty
(O)		
(KR)	# MAUs	# Subscribers per Month
KPIs	▪ Click-Through Rate (CTR%)[1] ▪ Interactions per User[2] ▪ Consecutive Visualizations[3] ▪ Bounce Rate (BR%)[4]	▪ Free-to-Premium Ratio[5] ▪ Incremental Revenue per month

Tactical Goals

[1] Ratio of RFY interactions over RFY impressions; [2] Mean RFY interactions per user; [3] Mean consecutive RFY views; [4] RFY impressions ratio without interaction; [5] Conversion rate from free to paid users

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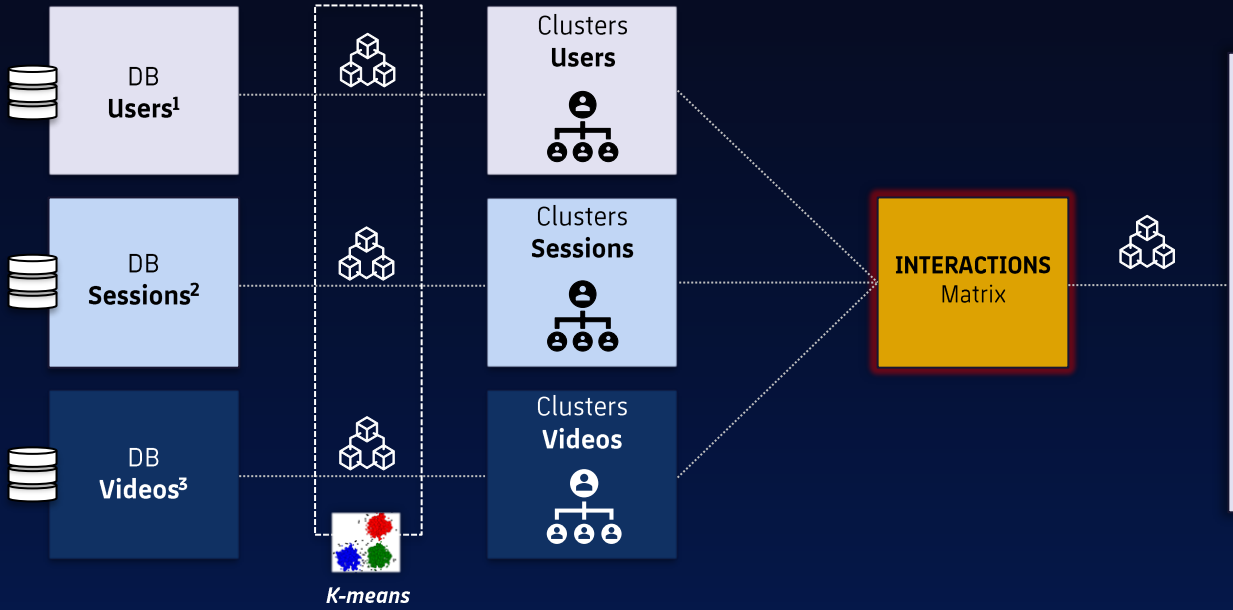
3 | SOLUTION

As a solution to achieve the objective, the project proposes a matrix recommendation methodology, based on the classification of videos, users and interactions observed in a given period of time.

It starts from three individual databases ... | *... in each one, clustering is applied ...* | *...resulting in three different groups...* | *...they are then put together and a new algorithm is applied to generate the model including the learning of the target variable*



Knowledge Model

User	Video	Session	Target
A	S	1	0
B	S	2	1
C	V	3	1

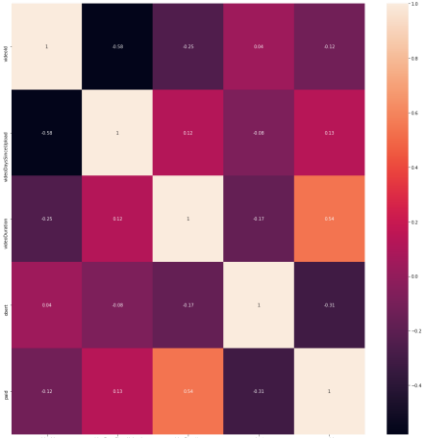
Target Variable = 1, if video played 30% or more of its total duration. Else, 0.

[1] A user registered in the digital ecosystem of F.C. Barcelona is defined by a series of demographic attributes (age, location, gender, etc.) and a set of attributes that describe its relationship with the ecosystem (date of registration, frequency of use, date of last use, type of user, etc.). Users can be occasional, registered or paid. [2] A session describes the viewing of a video by a user, also documenting the date and time of the video, the type of device, location, language, the time from and until the next game and a series of other attributes. [3] A video is defined by the type of its content (matches, players, Club, etc.), the publication date, duration, access level (paid, open), sport, etc.

APPENDIX

Examples of data treatment prior to the model:

Figure presenting the correlation matrix for videos after cleaning the attributes. The first column is the identifier and the following are the age of the video in the system in days, duration, if it is open transmission and if it is paid. It should be noted that the negative scale does not reach -0.6, so even the dark cells indicate a low correlation between the variables.



- Figure showing the result of the Mutual Information analysis of the 30 most influential variables; it can be noticed the low value of the level of influence of the attributes on the success of the visualization.

- This result led to the decision not to use the session properties as a dimension in the knowledge cube, reducing the model to two dimensions.

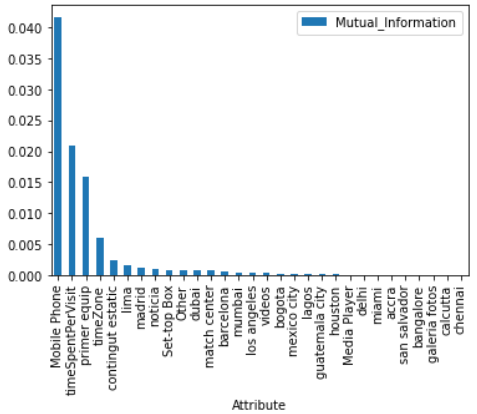
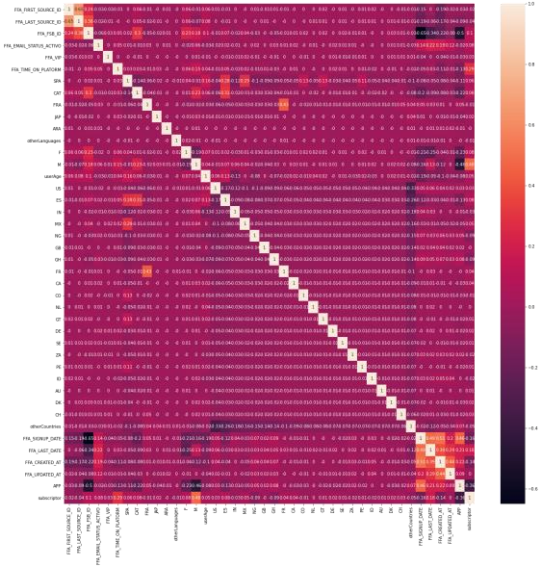


Figure presenting the correlation matrix for users after attribute cleaning. The details are not expected to be readable, it is presented to illustrate the complexity of the entity, based on the number of attributes.



3 | SOLUTION

Based on the acquired knowledge model, recommendations are made for users based on the best combinations of groups of the three variables.

Questions answered by the model

Given a **recurring user** U in a session S, what kind of video should be presented to him to increase the probability of a successful viewing?

When a **new user** enters the platform, what kind of video should be presented to him to increase the probability of a successful viewing?

Model in action

User 1 – type A
Session – type 1

User 2 – type B
Session – type 2

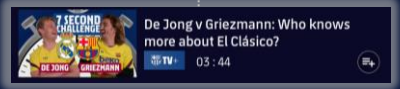
Knowledge Model

User	Video	Session	Target
A	S	1	0
B	S	2	1
C	V	3	1

NOT RECOMMENDED

RECOMMENDED

Target Variable = 1, if video played 30% or more of its total duration. Else, 0.



New Video – type S

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4 | RESULTS

With the construction of the model, we arrive at the results with the best combinations of video views by user class, which gives us the basis of the optimal recommendations for our objective...

Knowledge Model (Feb/21)

The knowledge model learned based on different combinations...

Knowledge Model

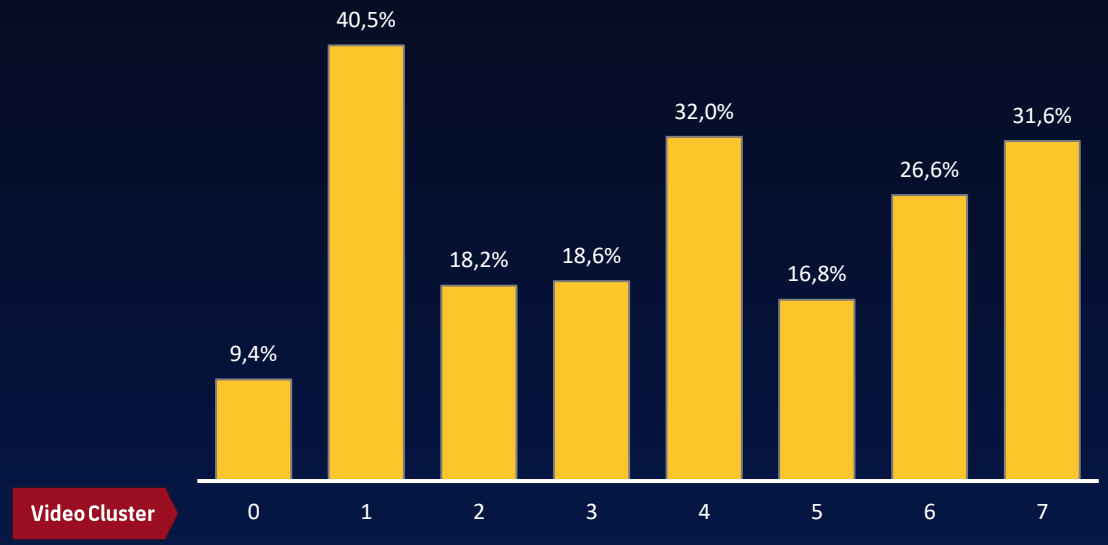
User	Video	Session	Target
A	S	1	0
B	S	2	1
C	V	3	1

Target Variable = 1, if video played 30% or more of its total duration. Else, 0.

6 User clusters
8 Video clusters

Model performance example for '0' users...

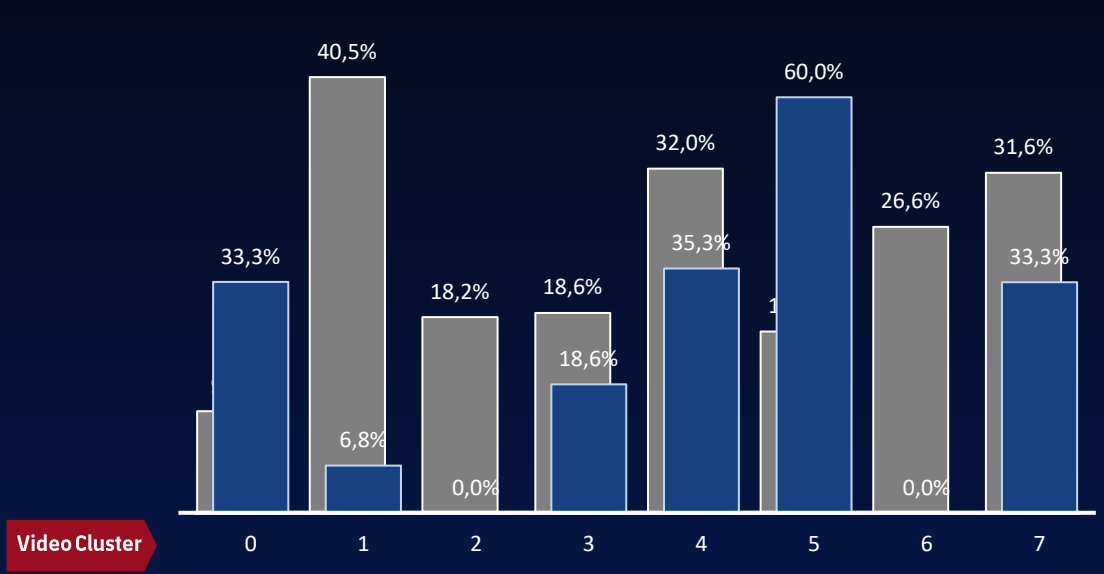
...returning which are the best recommendations based on the classes (% success)



4 | RESULTS

When the knowledge is applied to March 1st, the conclusion is that the model would not have generated better interaction results; we attribute this outcome to several possible causes.

Model Performance Example for '0' Users (March 1st/21)



Conclusions

- The conclusion in the knowledge matrix suggesting that showing class 1 videos to class 0 users would result in up to 40% successful viewing is rejected in this March dataset. The process was verified with other video and user classes and the behavior is similar.

- The reasons may be related to:
  - The period length used for the generation and validation of the knowledge.
  - Video relevancy declines in time
  - Possible high content variability that would affect the rating of the videos.
  - Uncertainty about the fact that the characteristics of the session do not contribute to the model.

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5 | FUTURE LINES OF WORK

The proposed recommendation methodology has potential for improvement. Here are some steps worth to investigate in order to improve the project's utility.

Actual Model

- Matrix Model
- Clusterization of three variables (User, Session and Video)
- Based on these groups, knowledge of the best combinations is generated.
- Based on this knowledge generated, the new videos are recommended to users

1 Data Enrichment

- Extend period lenght for knowledge generation
- Starting from the initial unsupervised classification, work should be done on the definition and documentation of classes of videos and users that allow a formal and consistent classification.

2 Business Logic

The methodology proposes a video class to be presented to a user according to his class at a given moment. The specific video to be recommended (or the order in which several videos will be recommended) will result from an algorithm that combines the videos of that class available in the library with the business rules applicable at the time, considering promotion priorities of some types of content .

3 Deeper Analysis

The study focused on the registered user and their conversion to a paid user. Converting from unregistered to registered users will require a different analysis, as there will be less data to classify and track users.

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