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Community Detection for Customer Segmentation in Music Streaming Platform

Dr Simone Santoni wrote this case to provide material for class discussion. The author does not intend to illustrate either effective or ineffective handling of a managerial situation.

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The Decision

Elena Martinez, Chief Data Scientist at a major European music streaming platform, stared at the clustering visualization on her screen. It was November 2024, and the company's marketing team needed a better way to segment their 6 million active listeners across Croatia, Romania, and Hungary. The traditional demographic approach—segmenting by age, location, and subscription tier—had proven inadequate for targeting music recommendations and advertising.

"We need to move beyond demographics," said Marcus Chen, the VP of Product, entering Elena's office in Zagreb. "Our users care about music genres, not just their age group. But how do we organize 40 different genres into meaningful customer segments?"

The Challenge of Music Segmentation

Music streaming platforms face a unique segmentation challenge. Unlike e-commerce or social media, where behavioral patterns align relatively well with demographics, music preference transcends traditional boundaries. A 45-year-old executive might share the same taste in electronic music as a 22-year-old student. Geographic location provides limited insight when genres like Hip-Hop and Electronic Dance Music have global appeal.

Traditional market segmentation approaches had failed to capture these nuances. The platform's previous strategy segmented users into six demographic groups based on age ranges and subscription types. While this approach worked for price setting choices, it proved ineffective for content recommendation and targeted marketing campaigns. Users within the same demographic segment often had wildly divergent musical tastes, leading to poor recommendation accuracy and low engagement rates with personalized playlists.

Elena's team recognized that the fundamental unit of similarity in music streaming was not demographic characteristics—it was *genre preference*. If they could understand how genres relate to each other through their shared audiences, they could build a more meaningful segmentation strategy.

The Network Approach

Elena is considering addressing this technical challenge by using network analysis techniques. Her intuition is that music genres cluster naturally based on *audience similarity*—genres that share overlapping listener bases tend to form communities.

The question was: should the company adopt a network-based approach to customer segmentation? If so, how?

Discussion Points

You have been provided with sample data regarding 54,573 platform users' genre preferences[1] and their social connections within the platform, called 'friendship'.[2].

1. If you are Elena, how would you analyze this data in order to persuade the advisory board to fund the innovative, network-based approach to customer segmentation?

2. What are the expected advantages of genre-based segmentation over demographic segmentation for a music streaming platform?

3. How might the identified communities change if we included social network data (i.e., friendship connections between users)?

4. How could the platform validate whether these communities lead to better business outcomes (engagement, retention, revenue)?

[1] `https://github.com/simoneSantoni/net-analysis-smm638/blob/master/data/deezer/HR_genres.json`

[2] `https://github.com/simoneSantoni/net-analysis-smm638/blob/master/data/deezer/HR_edges.csv`