

SR01 - FitFam Data Analysis Lab Project

International Innovation Literacy - Master Level (UTSEUS)

Project Description

This project aims to conduct a **complete data analysis of the FitFam fitness community** in order to understand and strengthen the dynamics of participation, leadership, and engagement within its network in China. FitFam is a community-driven, volunteer-led organization offering free group workouts across multiple cities. Its sustainability and growth rely on the quality and motivation of its leaders, the consistency of participants, and the expansion of its community base.

The lab will approach this case as a **real-world data science study**, applying engineering-level analytical rigor and research methodology to extract actionable insights from anonymized community data. Students will use data cleaning, visualization, and statistical analysis techniques to uncover patterns, validate hypotheses, and propose evidence-based recommendations for community management and growth.

Key Research Questions

1. Leadership Quality and Pipeline

- Who are the most dedicated and consistent leaders within the FitFam community?
- How can we identify patterns of leadership excellence or fatigue (e.g., burnout, declining engagement)?
- What skills or training could strengthen weaker leadership groups?
- Which participants are approaching the 50-workout milestone that qualifies them for leadership?

2. Participation Stability and Growth in China

- How stable is participation across cities and locations in China?

- Which cities show growth or decline, and what factors influence these trends (events, leaders, seasonality)?
- How do participation rates correlate with community visibility, morale, and event activity?
- What indicators could be used to anticipate community expansion or decline?

3. **Participation Consistency and Loyalty**

- How often do members participate—weekly, monthly, and over the long term?
- What proportion of participants attend regularly, drop out, or return after inactivity?
- What are the main factors that drive consistency in attendance?
- How does repeated participation relate to loyalty indicators such as apparel purchases, event engagement, or leadership progression?

Outline of the Scientific Work

1. **Data Understanding and Cleaning**

- Explore the structure of available data (participants, sessions, leaders, attendance, feedback, events).
- Conduct systematic data cleaning: handle duplicates, normalize formats, address missing values, and ensure consistency across time and locations.
- Document all transformations and assumptions in a reproducible manner.

2. **Data Representation and Descriptive Analysis**

- Generate descriptive statistics and visual representations of participation, leadership, and events.

- Develop time series and distribution analyses (weekly and monthly activity, growth trends).
- Build a structural overview of community networks (leaders-participants-locations).

3. Exploratory and Inferential Analysis

- Identify patterns in leadership activity and their correlation with participation stability.
- Study retention and consistency through cohort analysis and participant segmentation.
- Evaluate the effect of events, leader quality, and frequency on engagement metrics.

4. KPI Design and Quantitative Modeling

- Define measurable indicators (Leadership Quality Index, Participant Retention Rate, Growth Index).
- Apply appropriate statistical or machine learning methods (e.g., regression, clustering) to explain participation trends.
- Validate findings with confidence intervals and data visualization.

5. Interpretation and Recommendations

- Translate analytical results into insights supporting FitFam's strategic goals.
- Formulate recommendations for leadership development, community engagement, and operational stability.
- Emphasize ethical handling of community data and respect for privacy and inclusivity.

Expected Output:

A comprehensive analytical report and scientific summary detailing methodology, key findings, and recommendations to enhance leadership quality, participation stability, and engagement consistency within FitFam's community ecosystem.