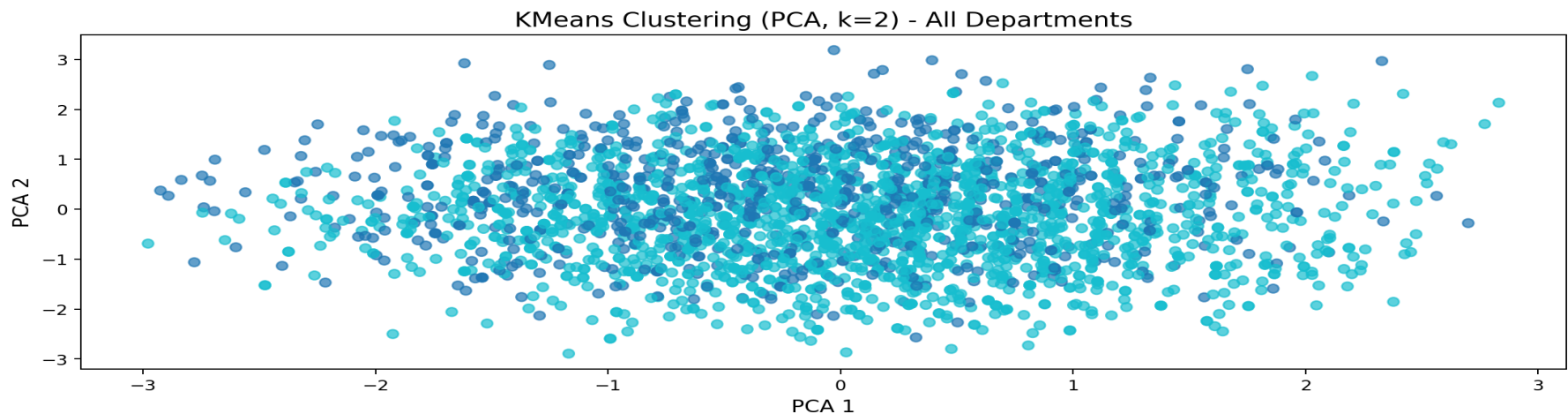# Clustering & Association Rule Mining Report

Department: All Departments

Dataset: C:/Users/juliu/Documents/analysis/paskuhan 2023.csv

Clustering (PCA)

Cluster Interpretation

Based on the KMeans clustering results, we can interpret the two clusters as follows:
Cluster 1: "Positive Experience"
This cluster represents a group where participants had a generally positive experience. The feature means for this cluster indicate:
- Objectives were slightly met (0.03)
- Venue ratings were above average (1.32)
- Schedule and Allowance ratings were slightly positive (0.04 and -0.01, respectively)
- Speaker and Facilitator ratings were slightly below average (-0.03 and 0.02, respectively)
- Participant ratings were slightly below average (-0.01)
Overall, this cluster suggests that participants had a slightly positive experience, with high venue ratings being a key factor.

Cluster 2: "Neutral to Negative Experience"

This cluster represents a group where participants had a more neutral to negative experience. The feature means for this cluster indicate:
- Objectives were not met (-0.01)
- Venue ratings were below average (-0.58)
- Schedule and Allowance ratings were neutral (0.00 and -0.02, respectively)
- Speaker and Facilitator ratings were slightly above and below average (0.01 and -0.01, respectively)
- Participant ratings were slightly above average (0.01)

Overall, this cluster suggests that participants had a more neutral to negative experience, with low venue ratings being a key factor.

The choice of k=2 using the elbow and silhouette methods suggests that these two clusters capture the main patterns in the data, and that further clustering would not reveal significantly more distinct groups.

Elbow & Silhouette Plots for k Selection
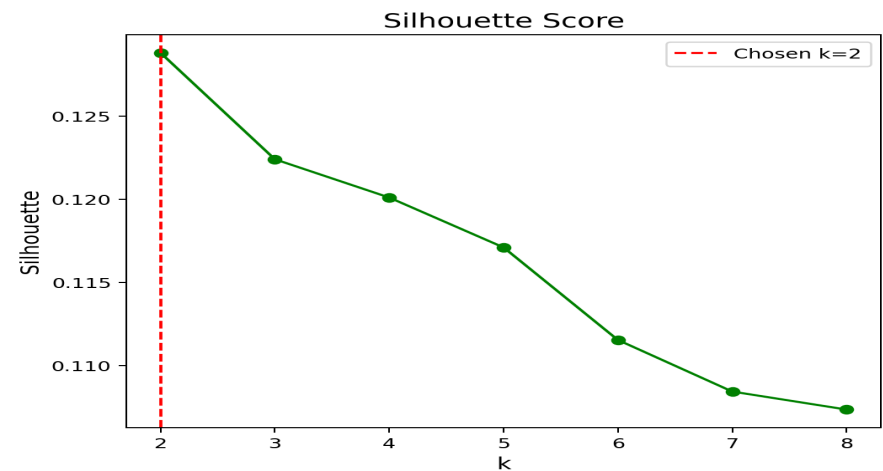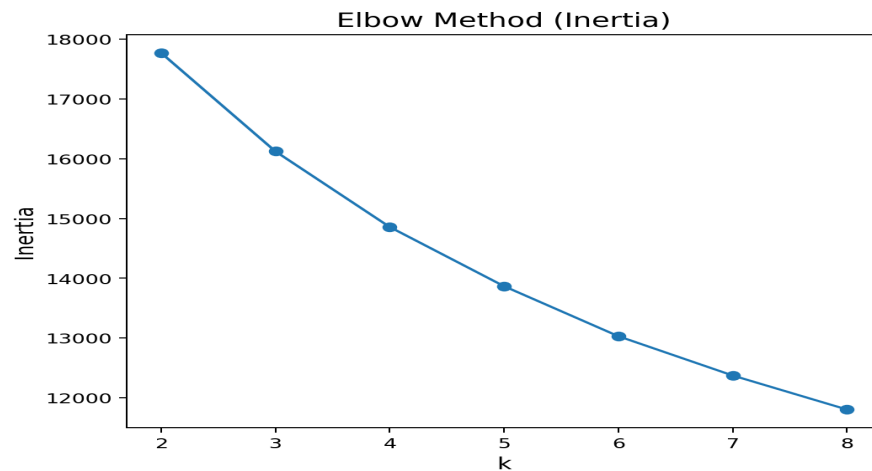
Association Rule Network

Association Rule Network

Association Rule Network

No association rules found

ARM Results Table

Antecedents	Consequents	Support	Confidence	Lift
No association rules found.				

Descriptive Analysis Table

Descriptive Analysis Table

Feature	Mean	Rating
Objectives_Met	1.98	satisfactory
Venue_Rating	1.00	moderately_satisfactory
Schedule_Rating	2.01	satisfactory
Allowance_Rating	1.00	moderately_satisfactory
Speaker_Rating	1.04	moderately_satisfactory
Facilitator_Rating	2.02	satisfactory
Participant_Rating	2.03	satisfactory

Descriptive Analysis (Categorical)

Descriptive Analysis for: All Departments
Categorical Columns Value Counts:
department_name value counts:
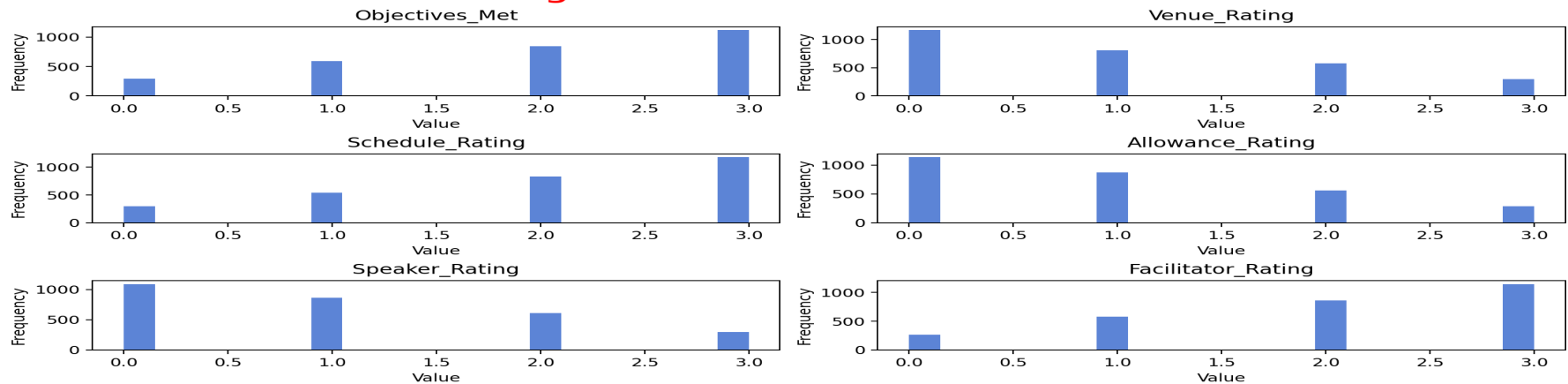department_name
SITE   623
SNAHS   579
SOM   561
BEU   558
SBAHM   533

Histograms

Histograms

Showing first 6 of 7 numeric columns

Recommendations

Recommendations for Improvement:
1. **Venue Management**: With a mean rating of 1.00, categorized as moderately satisfactory, there's an
 opportunity to enhance the venue experience. Consider conducting a thorough review of the venue select
ion process to identify areas for improvement, such as amenities, accessibility, and ambiance.
2. **Allowance**: Similar to the venue, the allowance rating of 1.00 suggests that participants might f
ind the current allowance insufficient or not entirely satisfactory. Reviewing and potentially adjustin
g the allowance structure could lead to higher participant satisfaction.
3. **Speaker Quality**: While the speaker rating is moderately satisfactory (mean=1.04), investing in s
peaker development or selection could further enhance the participant experience. This might include tr
aining for current speakers or seeking out new, highly-rated speakers.
Strengths to Maintain:
1. **Objectives Met**: With a satisfactory rating (mean=1.98), the event is generally successful in mee
ting its objectives. Continued focus on clear goal-setting and achievement will be crucial.
2. **Schedule Management**: The satisfactory rating (mean=2.01) for schedule indicates that the timing
and organization of the event are well-handled. Maintaining this level of organization will be importan
t for future events.

3. **Facilitator and Participant Engagement**: Both facilitators and participants have satisfactory ratings (mean=2.02 and mean=2.03, respectively), showing strong engagement and interaction. Efforts to maintain or enhance these aspects, such as through feedback mechanisms or social activities, should continue.

Actionable Insights:

1. **Balance Between Satisfaction and Improvement**: While many aspects of the event are satisfactory, there's a clear distinction between "satisfactory" and "moderately satisfactory" ratings. Focusing on elevating the "moderately satisfactory" areas to "satisfactory" or higher could significantly enhance overall participant experience.

2. ** participant Feedback Mechanism**: Implementing or enhancing a feedback mechanism during or after the event could provide more detailed insights into what works well and what needs improvement. This could include surveys, focus groups, or one-on-one interviews.

3. **Continuous Evaluation and Adjustment**: Regularly reviewing and adjusting strategies based on feedback and ratings will be key to sustaining strengths and addressing weaknesses. This might involve setting aside time after each event for a thorough review and planning session.

By addressing areas for improvement, maintaining current strengths, and leveraging actionable insights, the event can move towards achieving higher satisfaction ratings across all departments.

Trends

Feature Means Across Years (Baseline: Oldest Year)
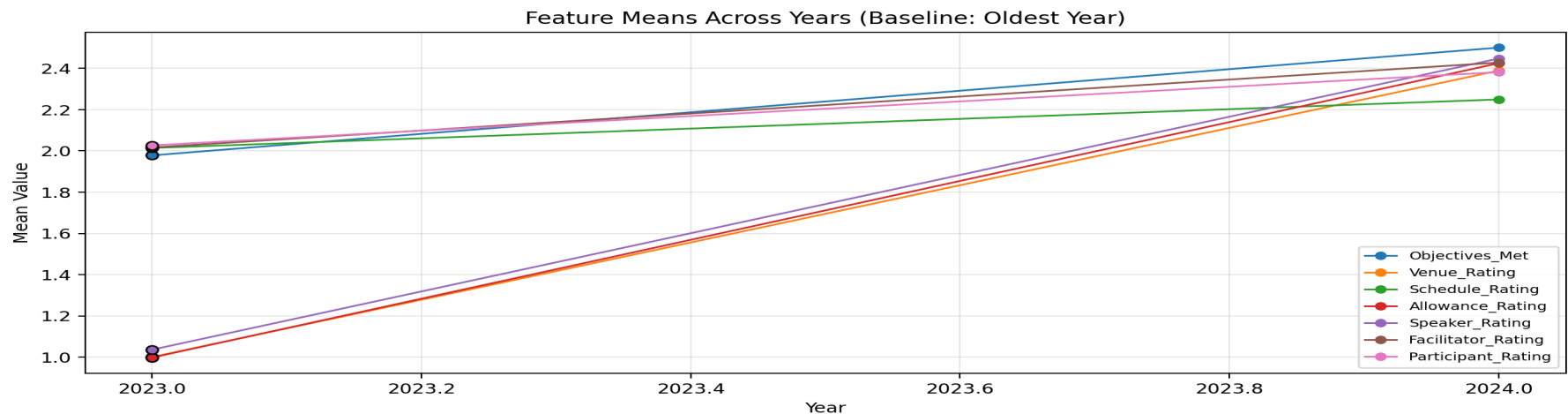
Trends Analysis

To analyze the trends in feature means across years, we need to compare the values of each feature betw

een 2023 and 2024.
1. **Objectives_Met**: Increased from 1.98 to 2.50, which is a significant improvement of 26.3%. **Improving**
2. **Venue_Rating**: Increased from 1.00 to 2.39, which is a substantial improvement of 139%. **Improving**
3. **Schedule_Rating**: Increased from 2.01 to 2.25, which is a modest improvement of 11.9%. **Improving**
4. **Allowance_Rating**: Increased from 1.00 to 2.42, which is a significant improvement of 142%. **Improving**
5. **Speaker_Rating**: Increased from 1.04 to 2.45, which is a substantial improvement of 135.6%. **Improving**
6. **Facilitator_Rating**: Increased from 2.02 to 2.43, which is a modest improvement of 20.3%. **Improving**
7. **Participant_Rating**: Increased from 2.03 to 2.38, which is a modest improvement of 17.2%. **Improving**

All features are showing improvement, with **Allowance_Rating**, **Speaker_Rating**, and **Venue_Rating** having the most significant increases. This suggests that the overall quality of the event or program has improved significantly from 2023 to 2024.

Actionable Insights:
1. **Continue to build on the strengths**: Identify the factors contributing to the improvement in **Allowance_Rating**, **Speaker_Rating**, and **Venue_Rating**, and reinforce these strengths to sustain the growth.
2. **Monitor and adjust**: Keep a close eye on the features that showed more modest improvements, such as **Schedule_Rating**, **Facilitator_Rating**, and **Participant_Rating**, to ensure they continue to improve.
3. **Analyze the causes of improvement**: Investigate the reasons behind the significant improvements in **Allowance_Rating**, **Speaker_Rating**, and **Venue_Rating** to apply similar strategies to other areas.
4. **Set new targets**: With all features improving, set new, more ambitious targets for 2025 to continue driving growth and excellence.

By following these insights, you can capitalize on the strengths, address areas that need more attention, and continue to improve the overall quality of the event or program.