Cross-Modular Assignment:
Group Market Research Assignment

MS Teams Market Research Report

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Introduction

In today's globalized and fast-paced business environment, effective communication and seamless collaboration are crucial for the success of any organization. The progress of technology, also driven by the outbreak of Covid-19, has revolutionized the way people interact with each other. One tool that has gained immense popularity is Microsoft Teams. As a communication and collaboration platform, Microsoft Teams has emerged as a game-changer, empowering teams, students, or individuals to communicate, share files, and collaborate in real time. Albeit recently slowed down growth, Microsoft reported 280 million users in January 2023 compared to just 13 million in 2019[1].

Microsoft Teams is part of the Microsoft 365 suite and combines chat, video meetings, file storage, and application integration into a single platform. Whether it's a small startup or a multinational corporation, organizations of all sizes have embraced Microsoft Teams as an indispensable tool for their day-to-day operations. Schools and universities also adapted to a more hybrid way of teaching and collaboration between teachers and students.

Microsoft Teams operates in a highly competitive market, where several communication and collaboration platforms fight for market share[2]. To assess how Microsoft Teams can continue to be the pioneer in the market of communication and collaboration platforms we surveyed professionals and individuals who have used Microsoft Teams as well as other competing platforms and analyzed the obtained data using factor and cluster analysis techniques.

The survey aimed to gather insights into the benefits experienced and overall satisfaction with Microsoft Teams as a collaboration tool. By analyzing the survey results, we gain a comprehensive understanding of the platform's influence on its consumers and their preferences. Overall, we found that personalizing strategies for each user segment could significantly increase satisfaction rates. As the digital collaboration landscape evolves rapidly, Teams must also continue to adapt.

Data Collection and Analysis

In this analysis, our objective is to explore the factors that impact user satisfaction with Microsoft Teams in order to gain insights into customer perceptions and overall experience. To achieve this, we conducted a survey among 111 users between the 20th and 25th of June 2023. We performed 3 major

[1] https://office365itpros.com/2023/01/26/teams-user-numbers-280million/
[2] Compare https://www.gartner.com/reviews/market/meeting-solutions/vendor/microsoft/alternatives

steps to derive our conclusion: First, we explored the data and possible correlations and relationships. Secondly, we performed a factor analysis to identify underlying dimensions related to customer behavior and preferences, and thirdly a cluster analysis to segment each group based on the attributes discovered before.

The dataset contains variables such as age, gender, residence area, preferences for video call tools, purpose of use (business or non-business), and favorite business communication tools. Participants also rated their satisfaction levels with various aspects of Microsoft Teams, including overall satisfaction, ease of use, features, security, performance, and accessibility (See Appendix 1 and 2).

During exploratory data analysis, we cleaned the dataset using Python code in Jupyter Notebook[3] and scaled the variables to ensure comparability. The correlation matrix allowed us to understand the relationships between respondent attributes, satisfaction, and importance and identify potential multicollinearity issues to ensure the validity of the regression models. The analysis revealed that usability and the range of features were moderately correlated with overall satisfaction (target variable) and there is no need to extract variables that can produce multicollinearity (See Appendix 3). In addition, we conducted a Principal Component Analysis (PCA) and a Factor Analysis to improve our understanding of customer needs and preferences. This allowed us to gain a deeper understanding of the underlying dimensions of customer perceptions and evaluate the need for dimensionality reduction.

Using a scree plot (Appendix 4), we analyzed the eigenvalues of each dimension to identify the most influential components. We found that the eigenvalues of the first five dimensions exceeded the threshold of one and captured a substantial amount of variance in the data (Appendix 5). We conclude that these five dimensions are sufficient for understanding customer perceptions, and explain together almost 60% of the total variance in the data. In our marketing analysis, we utilized Principal Component Analysis (See Appendix 6) to maintain the first five factors or components from the correlation matrix. By condensing the information from the original variables, PCA enables us to capture the most significant patterns in the data and assess the need for data reduction. By examining the Loadings Matrix and Factor Scores[4], we identified the variables with the highest loadings for each factor, emphasizing the key variables contributing to each latent dimension (loadings greater than 0.35 were sorted and displayed). The specific variables/attributes with the highest loadings for each factor can be found in Appendix 7. Based on the two regression analyses outlined in Appendix 8, we are now able to interpret the factors that reveal valuable insights and patterns in the data:

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3 The GitHub repository link with the analytical results of the Market Research.

4 The GitHub Link (Code in line 18).

Factor Label[5]	Factor Description	Highly Loaded Variables by Factor
Factor 1: Overall Satisfaction and Functionality	This factor represents overall satisfaction and captures elements related to ease of navigation, range of features, accessibility, reliability, and usability. Customers who score high on this factor have a positive perception of Microsoft Teams' functionality and exhibit higher satisfaction levels.	How satisfied are you with Microsoft Teams in meeting your overall needs?, How important do you feel about the Functionality in using Microsoft Teams?, How important do you feel about the Accessibility in using Microsoft Teams?
Factor 2: Usability and Functionality Focus	This factor emphasizes the importance of usability and functionality. Users who score high on this factor value the ease of navigation and the range of features offered by Microsoft Teams. Strengthening these aspects can further enhance their satisfaction.	How important do you feel about the Stability in using Microsoft Teams?, How satisfied are you with Microsoft Teams in meeting your overall needs?, How important do you feel about the Usability of using Microsoft Teams?
Factor 3: Communication Preferences and Tool Usage	This factor focuses on users' preferred communication tools and methods, especially for business communication. It encompasses variables such as preferred business communication tools and preferred video call tools.	Gender, Favorite Business Communication Tool, Favorite Video Call Tool
Factor 5: Security and Usage Purpose	This factor represents users' perceptions of the security measures implemented in Microsoft Teams and the main purposes for which they use the platform. It highlights the importance customers place on security and their specific usage purposes.	How important do you feel about the Security in using Microsoft Teams?, Main purpose of Use, Favorite Video Call Tool

After discovering the latent dimensions in our data through factor analysis, we proceeded to perform cluster analysis using data analytics techniques. The goal was to gain further insights into customer segmentation based on their preferences and characteristics related to Microsoft Teams. To determine the optimal number of clusters, we used the Elbow Method and examined the Dendrogram (Appendix 9). Running the K-means algorithm with 1 to 10 clusters, we calculated the within-cluster sum of squares (WCSS) values, indicating 3 clusters as the optimal choice for meaningful segmentation. Additionally, to better understand our customer base from a marketing perspective, we utilized the K-means clustering algorithm with our three distinct groups (see Appendix 10). This allowed us to effectively segment our customers and gain valuable information about their preferences and

5 Factor 4 not Significant (Refer to Appendix 8).

characteristics. By performing a comprehensive cluster analysis using the factor scores obtained earlier (see Appendix 7) and incorporating demographic variables (Appendix 12), we were able to draw a more complete picture of each cluster.

These results provided us with a solid foundation for developing targeted marketing strategies that respond to the unique needs and desires of each customer segment (see Appendix 13 for a detailed breakdown of the cluster profiles). The following table provides a comprehensive overview of each cluster group:

Cluster	Factor Description	Demographic Description
Cluster 0: **'Moderately Satisfied Collaborators'**	Cluster 0 shows a moderate level of satisfaction with MS Teams in meeting their overall needs (Factor 1) but places relatively lower importance on stability (Factor 2). They value communication tools and methods, especially for business communication (Factor 3).	The largest cluster has 57 individuals, with an average age of around 31 years old and a higher proportion of males (Gender value of 1). They are mainly located in Asia, with a residence area value of around 2.80.
Cluster 1: **'Highly Satisfied Feature Enthusiasts'**	Cluster 1 exhibits a higher importance placed on overall satisfaction and captures elements related to ease of navigation, range of features, accessibility, reliability, and usability (Factor 1) but places relatively lower importance on Factor 3 (which includes favorite business communication tool and favorite video call tool).	This cluster has 22 users, with an average age of around 35 years old and a slightly higher proportion of females (Gender value of around 1.9). They are predominantly located in Asia, with a residence area value of around 3.28.
Cluster 2: **'Security-conscious Users with Lower Satisfaction'**	Cluster 2 values security (Factor 5) and shows a high importance placed on usability (Factor 2) and moderate importance on Factor 3 (which includes favorite business communication tool and favorite video call tool). However, they have the lowest satisfaction level with MS Teams (Factor 1).	This cluster has 32 individuals, with an average age of around 39 years old and a slightly higher proportion of females (Gender value of around 1.6). They, like the other clusters, are mainly located in Asia, with a residence area value of around 3.29.

Conclusion

Our market research study has led to several significant insights regarding user satisfaction and functionality of Microsoft Teams. Users reported a high level of satisfaction with Teams' accessibility,

reliability, and user-friendly interface, highlighting a positive correlation between these elements and overall user satisfaction. They emphasized the desire for tools that are easy to use and functional, suggesting that improvements in navigation and feature availability could further enhance satisfaction scores. User preferences for business communication tools are diverse. To optimize Teams into a more user-centric platform, these preferences must be taken into account. Security considerations are also integral to user decisions to adopt Teams. Strengthening this area is likely to enhance user trust and satisfaction.

Our research identified three key user groups, each representing unique challenges and opportunities for enhancing the user experience. Moderately Satisfied Collaborators value Teams for its collaborative features but believe there is room for improvement, especially in advanced features and integration with other tools. Highly Satisfied Feature Enthusiasts have deeply integrated Teams into their workflow and desire even more features and integrations. Security-Conscious Users, while satisfied overall, have specific security needs not completely met by Teams. They may require strengthened data protection measures and more control over their data.

The following recommendations are based on these findings:

- Enhancement of Usability and Functionality: Improving user experience should be a top priority, making Teams more user-friendly and functional.
- Understanding Communication Preferences: Understanding users' communication preferences could facilitate customization of the platform to meet their needs.
- Boosting Security Measures: Enhancing security measures and creating transparency about such improvements could build user confidence.
- Strategizing for Each User Segment: Developing unique strategies to address the needs of each user segment could lead to personalized experiences and higher satisfaction rates.
- Investing in R&D: Keeping up with the rapidly changing digital collaboration landscape requires continued investment in research and development to meet evolving user needs.

In conclusion, Microsoft Teams can rise to the top by focusing on usability, functionality, security, and understanding user communication preferences. Personalizing strategies for each user segment could significantly increase satisfaction rates. As the digital collaboration landscape evolves rapidly, Teams must also continue to adapt. Teams' standard deployment with Office 365 provides it a significant competitive advantage, potentially reducing the pressure to innovate but shouldn't deter from the path of continuous improvement.

Capitalizing on our insights from Business Economics and Customer Analytics

We've incorporated several economic theories and principles in this market research paper.

We begin with the concept of Market Structure and Competition. Our findings emphasize the intense competition in the communication and collaboration platform sector, where big players like Slack, Google Workspace, and Zoom stand as significant competitors to Microsoft Teams. This competitive environment motivates Microsoft Teams to consistently enhance their services to maintain existing customers and attract new ones. At the same time, it could be explored whether Microsoft's deployment of Microsoft Teams together with Office 365 gives it a significant competitive advantage.

We can also say that we used Consumer Behavior Theory as our report heavily on this theory, which states that consumers make purchasing decisions based on the perceived value they get from different goods and services. In this scenario, Microsoft Teams' unique features and capabilities, such as functionality, security, and usability, play a crucial role in customer satisfaction and thus, their decision to continue using the platform.

Considering recommendations, we also suggest looking into Game Theory and Behavioral Economics. With Game Theory, by predicting competitors' moves, Microsoft Teams can innovate proactively to stay ahead. With Behavioral Economics, by understanding the biases and decision-making patterns that can influence user perceptions and actions, Microsoft Teams can design its platform to subtly influence users towards desired behaviors.

Business Economics can offer another viewpoint. By using concepts like Cost-Benefit Analysis, the company can make educated decisions about whether to develop new features or enhance existing ones. For example, our report implies the potential need for additional functions. Here, Business Economics can help evaluate the probable benefits against the projected costs of such enhancements.

Similarly, Demand Forecasting can offer insights into how modifications in price or product attributes might affect the demand for Microsoft Teams. Taking into account the price elasticity of demand can assist Microsoft Teams in making strategic pricing decisions to maximize revenue.

Moving to the methods from Customer Analytics, our report utilized techniques such as correlation analysis, regression analysis, principal component analysis (PCA), factor analysis, and cluster analysis. These are potent statistical methods that identify patterns, relationships, and groupings within the data.

In addition to these techniques, methods like Conjoint Analysis or Choice Modeling could have enriched the analysis. These methods provide a deeper understanding of how customers evaluate different features of a product or service and make trade-offs between them. Regrettably, we did not cover these in our classes, so we leave this for more advanced studies when we do our doctorates.

Sentiment Analysis could also be beneficial, especially when dealing with qualitative feedback from users. By examining the sentiments in user comments, Microsoft Teams could gain deeper insights into users' attitudes, emotions, and opinions about the platform. But once again, this is beyond the scope of this report.

In conclusion, blending economic theories with robust customer analytics methods can greatly improve market research. It not only provides insights into current customer perceptions and behavior but also enables companies to make strategic future decisions based on economic principles.

Appendices

Appendix1. Column details & Number of respondents

1. **Age**:
    - 1: 16 to 25 years
    - 2: 26 to 35 years
    - 3: 36 to 45 years
    - 4: 45 to 55 years
    - 5: 56 years to 65 years
    - 6: More than 66 years old
2. **Gender**:
    - 1: Male
    - 2: Female
    - 3: Other
3. **Residence Area**:
    - 1: Africa
    - 2: Antarctica
    - 3: Asia
    - 4: Europe
    - 5: North America
    - 6: Oceania
    - 7: South America
4. **Favorite Video Call Tool**:
    - 1: Microsoft Teams
    - 2: Zoom
    - 3: FaceTime
    - 4: Google Meet
    - 5: Skype
    - 6: Other
    - 7: Don't use any
5. **For Business or Non-Business**:
    - 1: For Business
    - 2: Non-Business
6. **Favorite Business Communication Tool**:
    - 1: Microsoft Teams
    - 2: Slack
    - 3: Zoom

- 4: Google Meet
- 5: Cisco
- 6: Other
- 7: Don't Use any

7. **Main purpose of Use**:
    - 1: Video Call
    - 2: Chat/Messaging
    - 3: Sharing Files
    - 4: Other

8-13. **Satisfactions Columns**:

- These columns contain ratings on a scale of 1 to 5, indicating satisfaction levels with various aspects of Microsoft Teams.
- Column 8: Overall satisfaction with Microsoft Teams in meeting your needs
- Column 9: Ease of navigating and using Microsoft Teams
- Column 10: Satisfaction with the range of features and capabilities offered by Microsoft Teams
- Column 11: Confidence in the security measures implemented in Microsoft Teams
- Column 12: Reliability of the performance of Microsoft Teams in terms of audio and video quality
- Column 13: Accessibility of Microsoft Teams across different devices and platforms

14-18. **Importance ratings for Microsoft Teams feature**:

- These columns contain ratings on a scale of 1 to 5, indicating the importance of specific features in using Microsoft Teams.
- Column 14: Usability (simplicity to use)
- Column 15: Functionality
- Column 16: Security
- Column 17: Stability
- Column 18: Accessibility

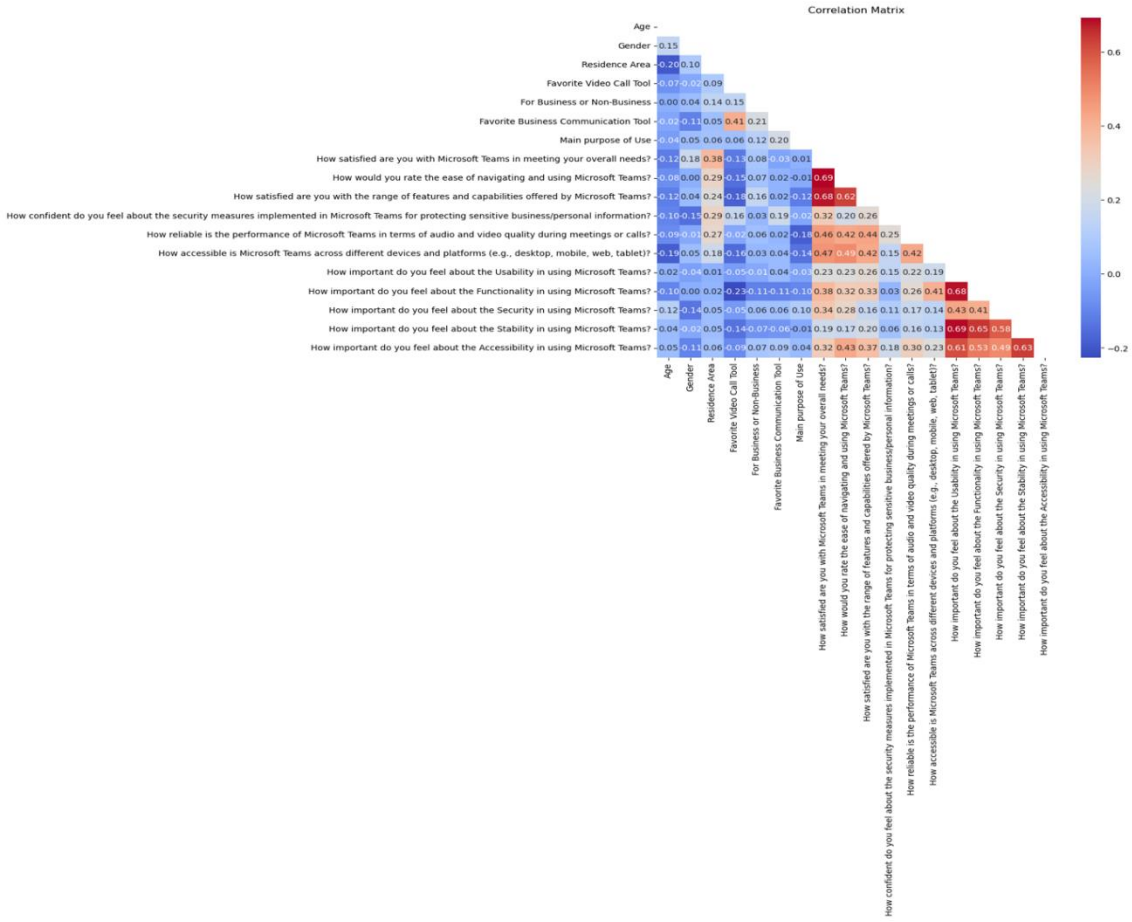
Appendix 2: Questionnaire Overview

Attributes: Age, Gender, Residence area, Favorite video call tool, Business use or Non-business use, Favorite business communication tool, Main purpose of using MS Teams

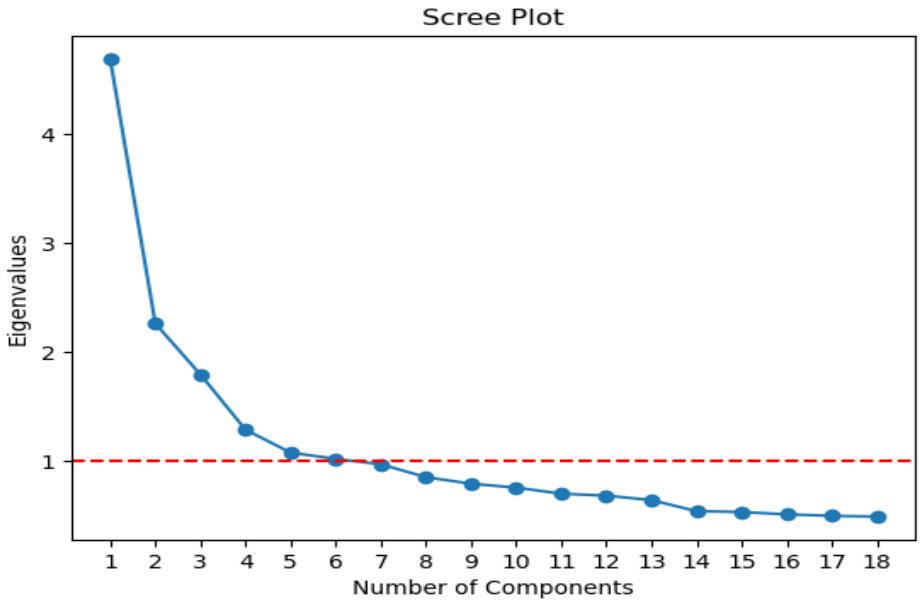
Satisfaction levels with various aspects of Microsoft Teams (Rating on a scale of 1 to 5): “Overall satisfaction”,” Ease of navigating and usage”, “The range of features and capabilities offered by MS Teams”,” Confidence in the security Measures”, “Reliability of the performance in terms of audio and video quality”,” Accessibility across different devices and platforms”

Importance ratings for Microsoft Teams feature (Rating on a scale of 1 to 5) : “Usability(simplicity to use)”,” Functionality”,” Security”,” Stability” ,” Accessibility”

Appendix 3: Correlation Matrix

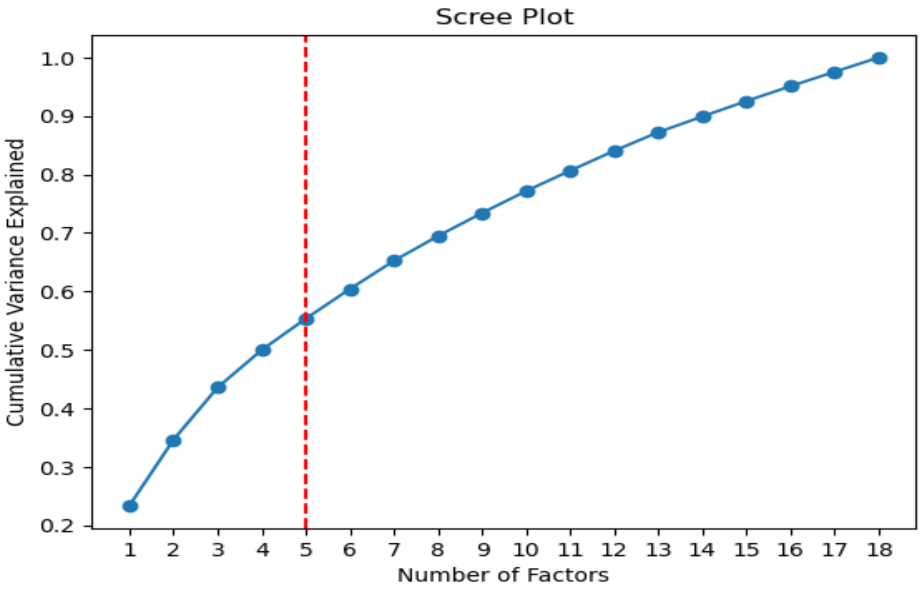


Appendix 4: Scree Plot/Eigenvalues



To determine the most significant components, we employed a scree plot, which plots the eigenvalues against the number of factors. Eigenvalues represent the amount of variance explained by each dimension or component in the analysis. In this case, the graph shows that the eigenvalues for the first five dimensions are above the threshold of one, indicating that they capture a substantial amount of variance in the data.

Appendix 5.Scree Plot/Cumulative Variance Explained



Based on the second scree plot, five eigenvalues collectively explain 57% (cumulative variance) of the total variance from the correlation matrix.

Appendix 6: Principal Component Analysis (PCA) and Factor Analysis Loadings

Principal Component Analysis (PCA):

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Standardized loadings (pattern matrix) based upon correlation matrix:
   Factor 1 Factor 2 Factor 3 Factor 4 Factor 5
1                                0.411    0.642
2                                0.588
3              0.337
4                        0.489
5                                 0.35
6                         0.54
7                        0.312    0.404   -0.588
8    -0.343
9     -0.33
10   -0.321
11
12
13
14   -0.304   -0.322
15   -0.333
16
17             -0.398
18   -0.333
```

Based on the matrix, it appears that there may not be a need to reduce dimensionality using PCA. The loadings matrix already contains the original variables without any significant reduction in dimensionality. Each variable is represented by a factor, and the loadings indicate the relationship between the variables and the factors.

Factor Analysis: SS Loadings, Variance, and dimensions

	Factor1	Factor2	Factor3	Factor4	Factor5
SS Loadings	4.305	1.831	1.261	0.975	0.507
Proportion of Variance	26.05%	12.55%	9.93%	7.10%	5.89%
Cumulative Variance Explained	26.05%	38.60%	48.54%	55.63%	61.53%

SS Loadings: This section shows the sum of squared loadings for each factor/component. The SS Loadings indicate the amount of variance in the original variables that is accounted for by each factor. For example, Factor 1 has an SS Loading of 4.305, which means it explains a significant amount of variance in the data. Similarly, Factor 2 has an SS Loading of 1.831, Factor 3 has 1.261, Factor 4 has 0.975, and Factor 5 has 0.507.

The proportion of Variance: This section represents the proportion of total variance explained by each factor. The values are expressed as percentages. For instance, Factor 1 explains 26.05% of the total

variance, Factor 2 explains 12.55%, Factor 3 explains 9.93%, Factor 4 explains 7.10%, and Factor 5 explains 5.89%. Collectively, these five factors account for a significant portion of the total variance in the data.

Cumulative Variance Explained: This section shows the cumulative proportion of variance explained by each factor. It represents the accumulated proportion of variance explained up to each factor. For example, Factor 1 alone explains 26.05% of the variance, Factors 1 and 2 combined explain 38.60%, Factors 1 to 3 explain 48.54%, Factors 1 to 4 explain 55.63%, and all five factors combined explain 61.53% of the variance.

Appendix 7: Factor Score/Highest loading on each factor

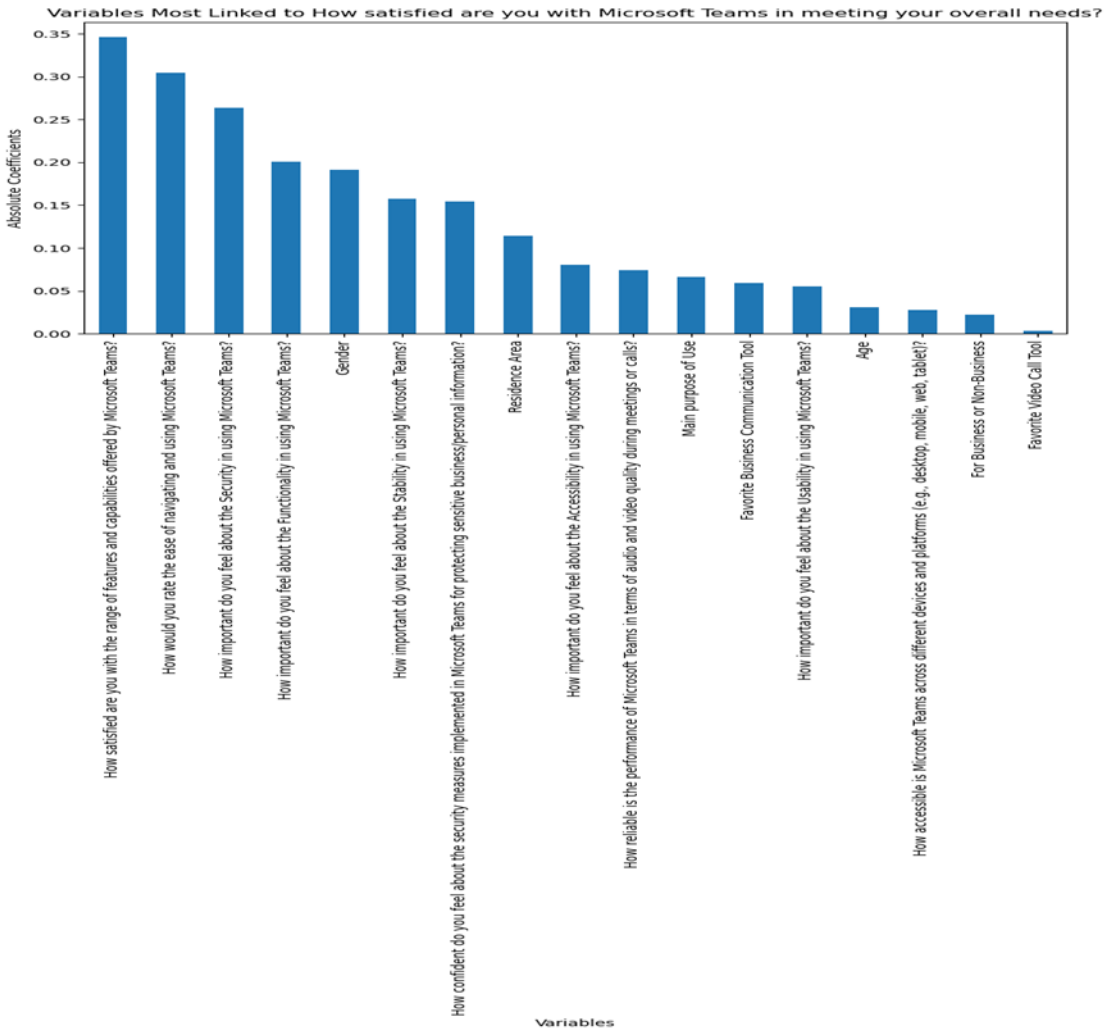
Factor 1: ['How satisfied are you with Microsoft Teams in meeting your overall needs?', 'How important do you feel about the Functionality in using Microsoft Teams?', 'How important do you feel about the Accessibility in using Microsoft Teams?']
Factor 2: ['How important do you feel about the Stability in using Microsoft Teams?', 'How satisfied are you with Microsoft Teams in meeting your overall needs?', 'How important do you feel about the Usability of using Microsoft Teams?']
Factor 3: ['Gender', 'Favorite Business Communication Tool', 'Favorite Video Call Tool']
Factor 4: ['Gender', 'Favorite Video Call Tool', 'Favorite Business Communication Tool']
Factor 5: ['How important do you feel about the Security in using Microsoft Teams?', 'Main purpose of Use', 'Favorite Video Call Tool']

Appendix 8: Regression Analysis

All Variables: The first regression analysis considered all the variables in the dataset to assess their collective influence on user satisfaction. The results revealed an R-squared value of 0.721, indicating that approximately 72.1% of the variation in satisfaction can be explained by the included variables. The adjusted R-squared of 0.670 suggests high goodness of fit even after considering the number of predictors.
The regression results for all variables analysis indicate that several factors have a statistically significant impact on satisfaction. From the regression, we sorted the absolute coefficients in descending order and plot the variables most linked with the variable “How satisfied are you with Microsoft Teams in meeting your overall needs?”
We can see that the variables that have less impact on overall satisfaction are “Age” (-0.03), “How accessible is Microsoft Teams across different devices and platforms” (0.02), “For Business or Non-

Business” (-0.02) and “Favorite Video Call Tool” (-0.05). Among the variables with the most impact on overall satisfaction we find How satisfied are you with the range of features and capabilities offered by Microsoft Teams? (0.34), How would you rate the ease of navigating and using Microsoft Teams? (0.30), How important do you feel about the Security in using Microsoft Teams? (0.26) and How important do you feel about the Functionality in using Microsoft Teams? (0.20).

Variables Most Linked to Overall Satisfaction:



Selected Factors: In the second regression analysis, we focused on the five selected factors to explore

their individual impact on satisfaction. This analysis yielded an R-squared value of 0.875, implying that these factors account for approximately 87.5% of the variation in satisfaction. The adjusted R-squared of 0.869 further supports the model's goodness of fit.

The regression analysis reveals that satisfaction with Microsoft Teams (y) is influenced by several factors. An increase in Factor 1 corresponds to a 0.7930 increase in satisfaction, while an increase in Factor 2 leads to a 0.5439 increase. However, Factor 3 shows a decrease of 0.0903 in satisfaction with each unit increase. Conversely, Factor 4 contributes a small positive effect of 0.0435, and Factor 5 has a moderate positive effect of 0.2197 on satisfaction.

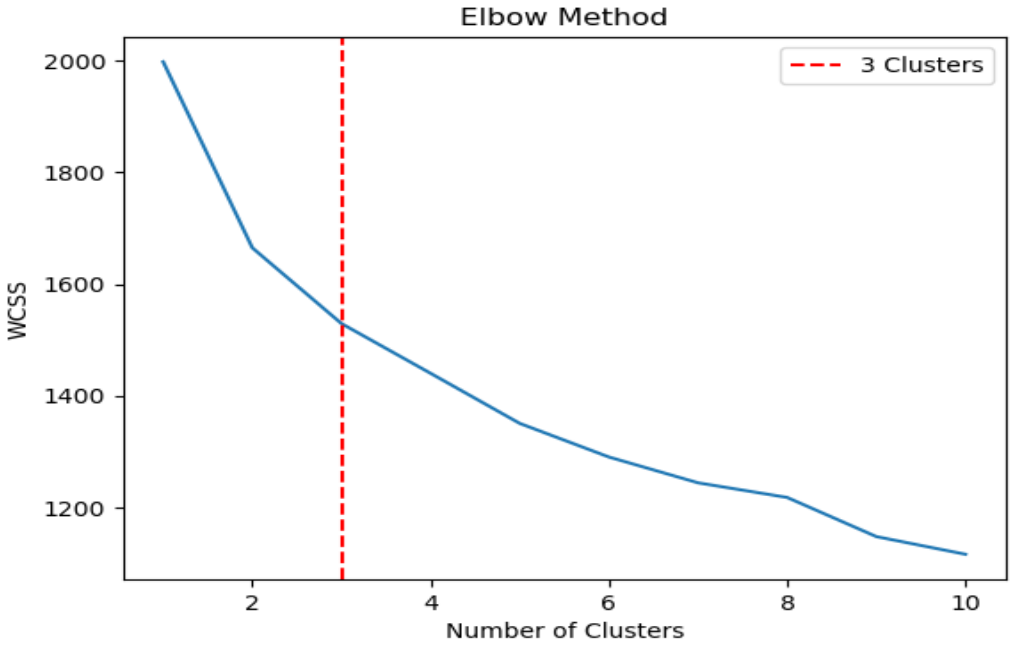
In the regression analysis, we investigated the significance of Factors 1, 2, and 5 as predictors of satisfaction with Microsoft Teams. Factors 1 and 2 demonstrated statistically significant effects on satisfaction ($p < 0.05$), indicating their importance in influencing satisfaction levels. We also considered Factor 3, although with some caution due to the wider confidence interval and a slightly higher p-value ($p = 0.023$). This implies that while Factor 3 may have a significant impact, there is some uncertainty surrounding its precise effect on satisfaction. Factor 4 was not included in the analysis.

	coef	std err	t	P>|t|	[0.025	0.975]
const	-2.368e-16	0.035	-6.86e-15	1.000	-0.068	0.068
x1	0.7930	0.036	22.133	0.000	0.722	0.864
x2	0.5439	0.038	14.412	0.000	0.469	0.619
x3	-0.0903	0.039	-2.307	0.023	-0.168	-0.013
x4	0.0435	0.038	1.145	0.255	-0.032	0.119
x5	0.2197	0.048	4.591	0.000	0.125	0.315

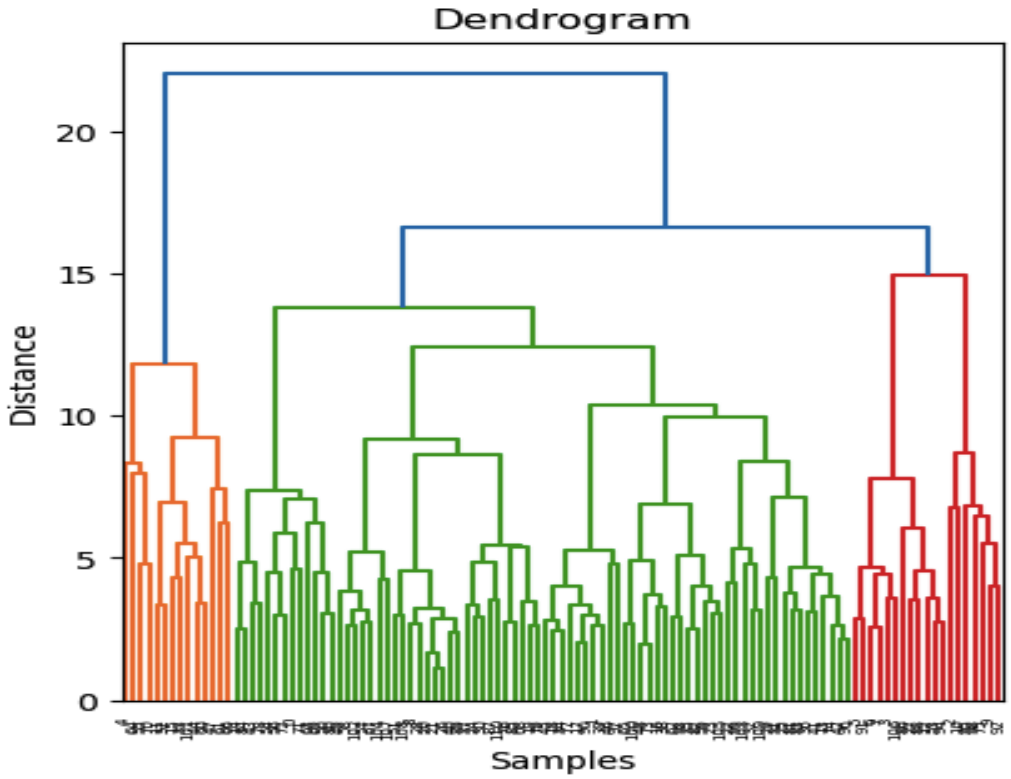
Omnibus:	1.719	Durbin-Watson:	1.835
Prob(Omnibus):	0.423	Jarque-Bera (JB):	1.232
Skew:	0.103	Prob(JB):	0.540
Kurtosis:	3.474	Cond. No.	1.40

Notes:
[1] Standard Errors assume that the covariance matrix of the errors is correctly specified.

Appendix 9: Elbow Method and Dendrogram to determine the number of clusters

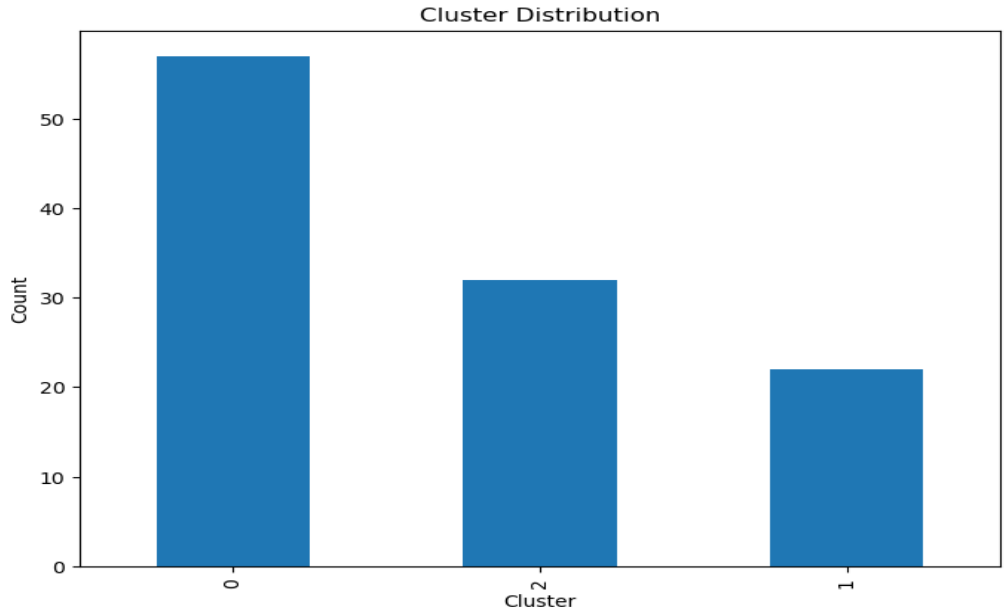


To determine the appropriate number of clusters, we employed the Elbow Method, which evaluates the within-cluster sum of squares (WCSS) for different cluster numbers. We ran the K-means algorithm with varying numbers of clusters (ranging from 1 to 10) and recorded the corresponding WCSS values. By plotting the WCSS values against the number of clusters, we identified the "elbow" point, indicating the optimal number of clusters. In this case, we selected 3 clusters as it struck a balance between minimizing WCSS and capturing meaningful segmentation.



By analyzing the Dendrogram, we considered the longest vertical distance as a potential indicator. Although we could have chosen 4 clusters based on this analysis, we decided to focus our targeting by selecting 3 clusters to capture meaningful segmentation.

Appendix 10: Cluster Distribution



Appendix 11: Cluster Analysis

Cluster	Factor1	Factor2	Factor3	Factor5
0	-0.190	-0.989	0.603	-0.129
1	0.519	0.135	-0.479	0.038
2	-0.996	0.915	0.384	0.071

Appendix12: Cluster Analysis including demographics (Age, Gender, and Residence Area)

Cluster	Factor1	Factor2	Factor3	Factor5	Age	Gender	Residence Area
0	-0.190	-0.989	0.604	-0.130	3.100	1.300	2.800
1	0.520	0.135	-0.480	0.038	3.000	1.893	3.281
2	-0.997	0.916	0.385	0.072	2.833	1.625	3.292

Appendix 13: Cluster Profiles