Hierarchical Clustering Method to Determine Admission Promotion Strategy of New Students

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Abstract : ***This study aims to determine the promotion strategyon the admission of new students at the Department of Computational Sciences in university. Department need appropriate promotion strategies to increase the number of new students enrolled in subsequent years and to fulfill the equal distribution of new students in each region and study programs atthe University. Classification of new student data reception at the University in 2022/2023 uses the WEKA data mining application using the Hierarchical Clustering method. Research data using primary and secondary data. The population and sample of the study were 180 students using 10 (Ten) attributes in this study, namely the Student Code, Year, Name, Country, State, District, Emailid, Undergraduate Degree, University of UG, Mode of Admission(Direct, Reference, Alumni, Media,Others). This test is carried out with the Waikato Environment forKnowledge Analysis (WEKA) 3.9.6 tool. The results of this study indicate that the direct visit and Alumni strategy is the most appropriate in the admission of new students at University, many new students from Hoogly, Kolkata Districs, Many of the Students from BCA/B.Sc degree from thei Undergraduate Degree. The results shows that many of the students have done their undergraduate degree in the same university.***

Keywords : ***Promotion strategy, data mining, Hierarchical clustering, new students' admission***

I. INTRODUCTION

Modern and sophisticated information technology in all fields has developed very fast and advanced in the fields of economy, industry, education, communication and information and promotion.

Application of information technology in the field of Promotion can help manage valuable and useful information so that it has its own added value to be achieved with what is desired both for Universities that are facing competition in the business world. promotion is the main tool for the success of an organization / university in attracting the attention of consumers. (Adefulu, 2015). Promotion requires the right plan so that everyone who is a target or promotion target of the University is realized so that competitiveness can also be increased in each region where there is an equal distribution of students. Promotion strategies are based on consumer behavior, in the form of desires for what is offered by organizations / universities in the form of products or services. (Chaharsoughi and Yasory, 2012) University is the largest private tertiary institution in West Bengal which has 9 Schools. Each Schools having study program that can be an option for new students New Student Admission Activities at University are activities that are held regularly for new students. University continues to improve the quality of facilities, lecturers, employees, administration, buildings, facilities, etc., but some obstacles are not related to the number of new student admissions so that the emergence of private universities and other high schools around the West Bengal region so that the very tight competition made the University recruit new students to continue to plan the right strategy to determine the promotion strategy so that the number of new students enrolled in each year is obtained. Collection of student data obtained from historical data, so the data is obtained every year continuously. Large data will extend the search for information from several groups based on the characteristics of the data at the University, forming some grouping of student data so that it can determine an effective and efficient promotion strategy for the University.

Large data can be implemented using data mining. Data Mining is designed to discuss data (usually large amounts of data - usually related to business) to find patterns that match the reinforcement pattern which is translated into a new subset. (Hajizadeh, Ardakani, and Shahrabi, 2010) Grouping of student acceptance data is grouped using Hierechical Clustering, grouping data into several clusters based on the similarity of the data so that the relevant data are also grouped by the same cluster and the same have different characteristics which are grouped in other clusters that have the same similarity. Hierarchical Clustering has the advantage of being able to make large data groups quickly and efficiently to be able to make decisions in determining a very effective promotional strategy the following year.(Kashwan and Velu, 2016), (Kusuma, 2017), (Asril, Wiza and Yunefri, 2015).

To meet the number of new student admissions in each quarter, this study is to analyze and process student data in the previous year from the department, in determining the results of the information on promotion strategies in the following year. The data attributes that will be used in this study are the name of the student, promotion strategies that include media, direct visits, brochures/banners/banners, References, and coming directly, from the area of students and study programs that are expected to help and help increase the promotion team University in conducting research New students from various regions in west bengal specifically. Processing these data attributes using the WEKA (Waikato Environment for Knowledge Analysis) application tool for determining promotional strategies at the Department. (Tiwari, Jha and

Yadav, 2012). The problem that can be formulated in this background is the title of this research is the Implementation of Data Mining for Promotion Strategy for Admission of New Students using the Hierarchical Clustering Algorithm.

II. METHODOLOGY

This study uses a qualitative method. In this study, the population and study sample were all New Student Admissions at the one department in University 2022/2023, totaling 180 students.

Research data using secondary data collected from dataon the admission of First year and second year students who have registered at Department in University.

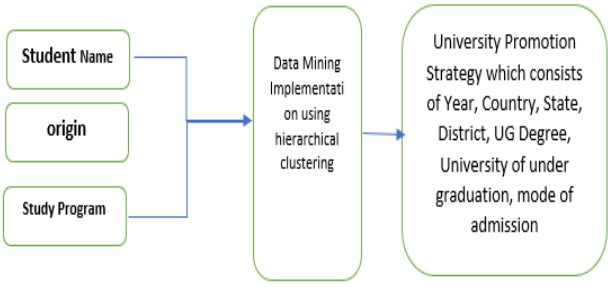

Fig. 1 Research Thinking Framework

III. ANALYSIS RESULTS

Determining the Purpose of a Business (Research) Determination of the business The study was based on data on prospective students in 2022/2023 who requested the number of new students in 2024/2025 at Department. Processed data improves the quality of service in the promotion section as preliminary information obtained as one of the bases in taking results in determining an effective promotion strategy for the admission of new students the following year at the department.

At the data reception hearing, there will be an initial (raw) admission of new students in 2024/2025 at Department. Data is collected from the 2 years of students in particular department. The data used in this study are prospective students from MCA around 180 students. Preliminary data for admission of new students come from the names of students, UG , District, State ,country and Mode of admission.

To produce data sources carried out through the data mining process, using a database of new student admissions for the 2023/2024 and last year students 2022/2023 year.The new student admission dataset in 2023/2024 and last year students 2022/2023 after assessing the quality of the data, the selection of attributes of this study consisted of the attribute number of new student admission data for the 2022 and 2023 year admission of 180 students.

Data Preprocessing

This study has selected only 7 attributes like year, country, state, district, under graduation degree, university of UG, Mode of admission. From secondary data having 10 parameters, but this research has taken only 7.

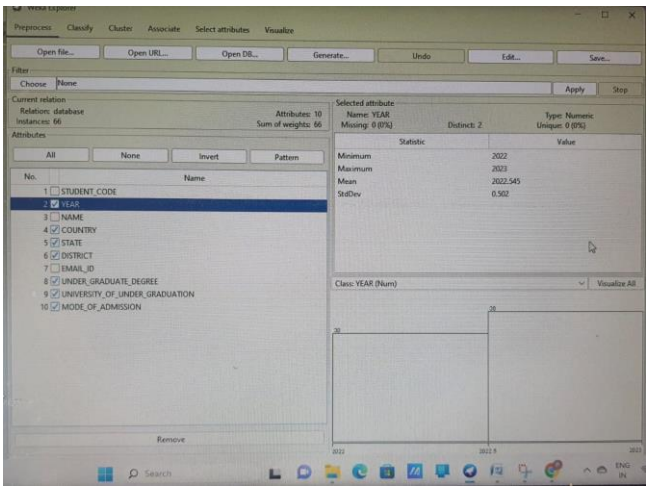

Fig. 2 Data Preprocessing With WEKA Tool

After importing dataset in to WEKA tool, Selected Hierarchical clustering algorithm from Cluster tab and selecting mode of admission as class name. The results shown that many of the students from alumni members of the same university.

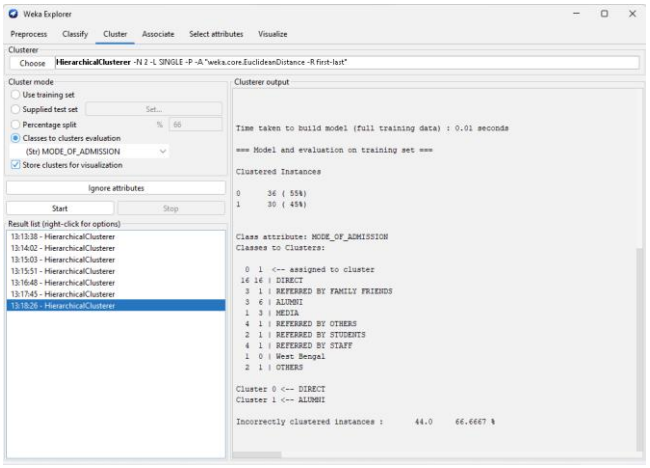

Fig. 3 Mode of admission with the WEKA Tool

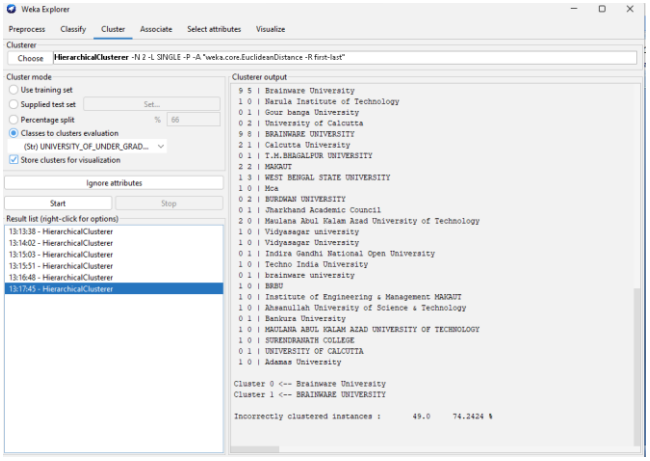

Fig. 4 University of Under Graduation with the WEKA Tool

The following Results shows that many of the students were admitting their Master degree from BCA/B.Sc only. In the dataset having the Under Graduation degree like BBA/B.Com-CA. But The results told that many new students from BCA/B.Sc only.

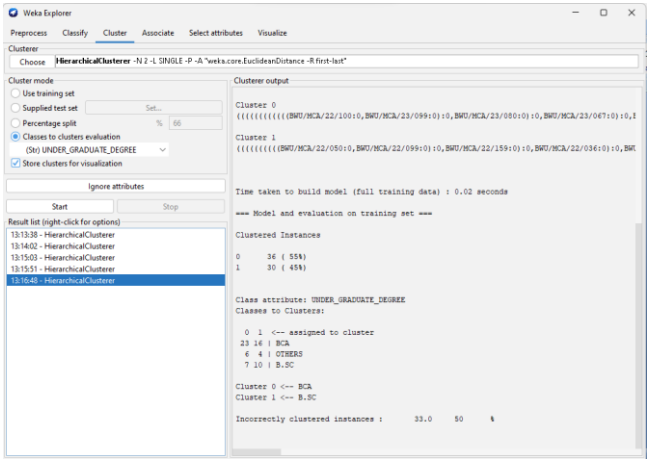

Fig. 5 Test iteration with the WEKA Tool

IV. CONCLUSIONS AND SUGGESTION

A.Conclusions

From the research that has been conducted the grouping of student data for the 2022/2023 year through the distribution of regional origin and Study Programs based on promotion strategies using Hierarchical clustering. Dataset contains the 180 students information with 10 attributes.

The promotion strategy for the admission of new students at the department in University is based on the cluster formed in the 2022/2023 new admissions dataset which is a direct visit and Alumni of the same institution . Many students have come from Hoogly and Kolkata. New students have been comlted their Under Graduation Degree form BCA/B.Sc.

B. Suggestion

- Grouping of student data 2022/2023 should be done routinely the following year to improve the quality of promotional data so that it becomes the right decision for the next year's promotion strategy.

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