

THE CLASSIFICATION OF PROMOTION MEDIA OF A COLLEGE TO IMPROVE THE MANAGEMENT OF PROMOTION FOR A PRIVATE COLLEGE IN THE EAST OGAN KOMERING ULU DISTRICT

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Abstract

Educational institutions are strategic sectors that can produce quality human resources where educational institutions take place quickly and dynamically. The development and progress of an educational institution are very dependent on the human resources that manage the institution. Promotion media is very important for the progress of an educational institution. Promotion media is means used to introduce and communicate a product or brand to be known to the wider public. There are three categories of promotional media namely print media, electronic media, and online media. Based on the 2018 BPS, those interested in print and electronic media as a source of information were 25.53% while for online media in 2019 there were 64.8%. So that promotions can be carried out appropriately according to regional conditions, it is necessary to classify promotional media by region. This study aims to classify promotional media according to the region using the C45 algorithm method. The C45 algorithm is used as a decision tree classification model to predict promotional media that is suitable for the promotional target area. To form a decision tree, attributes needed are used as a reference for classification, in this study six attributes are used, namely the availability of internet services, the availability of electricity services, community work, community income, education, and access from the region to the district government.

1. INTRODUCTION

The need for formal education for the community is very high, it makes the college as a strategic sector that can produce quality human resources. Educational institutions are a form of Service Company where service quality is preferred. This is because the quality of service is one of the main highlights of students as users of educational institutions. Educational institutions play an important role in the quality of human resources, besides that education is also a key to the progress of a civilization, where civilization is a measure of the progress of a country.

In the era of globalization, educational institutions face a lot of competition, where educational institutions take place quickly and dynamically. Private college educational institutions are in a global competition where each institution is faced with choices to create various advantages both in the fields of facilities, infrastructure, teaching staff, and study programs that can attract attention. The development and progress of an educational institution are very dependent on the human resources that manage the institution. In addition to facilities, infrastructure, and quality human resources, promotion media also play an important role in the progress of an educational institution.

Promotion media is a means of communicating a service, brand or product to be better known by the wider community. Several media can be used as a means of promotion, namely print media, electronic media, and online media.

Based on BPS 2018, those interested in print and electronic media as sources of information were 25.53, then for urban enthusiasts 11.41, the number of interested people in rural areas was higher, reaching 19.24. According to data from the Indonesian Internet Service Providers Association (AJPII), internet user penetration in Indonesia has increased rapidly from 51.4% (around 132.7 million users) in 2016 to 64.8% (around 171.17 million users) in the year 2019.[1][2]

Based on the research of Dine Tiara Kusuma and Nazori Agani (2015), this study used a prototype clustering model comparison with the K-Means method as a determination of the high school promotion strategy. The results of the study are in the form of a system that can assist the team in analyzing the results of data clustering.[3]. the research conducted by Yustian Servanda (2018), the study uses two methods, namely the TOPSIS and AHP methods as a decision support method that can help analyze the effectiveness of the promotional media used[4]. then research conducted by Ninanesa

Rusdiana, Heri Susanto and Jamal (2018), the study applied cyber marketing as a solution to improve quality and effectiveness in overcoming promotion problems[5]. Furthermore, the research conducted by Eka Umi Kalsum (2012) simultaneously obtained that products, prices, promotions, places, people, processes, and services, together have a highly significant effect on the decision of students to choose at the Faculty of Economics at Al-Azhar University, Medan. The results of the second hypothesis testing using the Simple Linear Regression test obtained that the accreditation status has a very close relationship with the decision of students to choose at the Faculty of Economics, Al-Azhar University, Medan[6]. Garaika and Winda Feriyan (2018), conducted research on the influence of promotional media in increasing the interest of prospective new students where the results of the study were the potential and excellence of higher education institutions to be mobilized as much as possible to face competition, so it was very important for universities to do branding to introduce their campuses, therefore, universities must have branding [7][8]–[10].

Promotion is an attempt by private college institutions to attract prospective new students. In previous studies, decision support methods, cyber marketing methods, and K-Means methods have been used with the results of the analysis that can help analyze the effectiveness of a promotional media, so in this study, researchers tried to classify promotional media based on promotional areas using the C45 algorithm method. This study aims to help private colleges classify appropriate promotional media according to the conditions of the promotion area. The existence of this research is expected to be able to help private colleges in using promotional media following the objectives of the promotion area.

II. LITERATURE

2.1 Data Mining

Turban (2015) Data mining is a process that uses statistical techniques, mathematics, artificial intelligence, and machine learning to extract and identify useful information and related knowledge from various large databases[11].

Data mining is a series of processes to explore the added value of a data set, in the form of knowledge that has not been known manually [12].

Larose (2005) Data mining is divided into several groups based on the tasks that can be done, by namely:

1. Description
Describing simply about the data and trends contained in the data.
2. Estimation
Estimates are almost the same as classifications, only with different target

variables, where estimation variables are more numerical than categories.

3. Predictions
Prediction is almost the same as classification, except that in the prediction the value of the results will be in the future.
4. Classification
The classification is almost the same as the estimation, only in the classification; there is a target variable category.
5. Clustering
Clustering is a record, observation or pay attention and form a class of objects that have similarities. Clustering is different from the classification where there is no target clustering variable.
6. Association
The task of association in data mining is to find the attributes that appear in time.[13]

2.2 Promotion media

Media promotion is a means used to communicate a product, service, brand or company and others to be known to the wider community. The oldest promotional media is word of mouth, followed by conventional promotional media in the form of print media such as brochures, posters, catalogs, pamphlets, booklets, banners, billboards, banners, flyers, billboards, business cards, newspapers, magazines, and through electronic media like TV ads, radio and so on. because of the development of technology, promotional media has also undergone development, in which the promotion media are developing with the rise of the digital sphere such as promotion through social networks and social media such as Instagram, Blogs, Websites, Facebook and Twitter, etc. The development of print media technology such as newspapers and magazines, where newspapers and magazines can not only be read through print media but can be read or accessed through online media. However, none of the media is categorized absolutely in terms of accuracy and effectiveness.

2.3. Types of Promotion Media

Sri Ipinuwati (2016), various promotional media that can be used in promoting a product or service being marketed. Promotional media that can be used in promoting are as follows:[14];

1. **Brochure**
It is a non-periodical issue that is not hardbound, complete (in one issue), The form and contents of a brochure or pamphlet are generally printed on both sides, and folded with certain fold patterns to form several separate panels
2. **Catalog**

This media usually contains more complete information than flyers or brochures, it is very appropriate to promote a large number of products. The catalog contains more complete information, from information about product specifications, product images, advantages and advantages, even every time the product price is also informed.

3. **Pamphlet**

Pamphlet is a kind of non-bound booklet. It may consist of only one sheet printed on both surfaces. The use of pamphlets or leaflets is generally done for the marketing of various products and also for the dissemination of political information.

4. **Booklet**

Is a mass communication media that aims to convey promotional messages, recommended, prohibited to the mass audience and in the form of print. So the end of the goal is that the people who as objects understand and obey the message contained in the mass communication media. The messenger is not direct (delayed). It requires a lot of energy in its spread.

5. **Banners**

Banners are a media of information and promotion that are often used by companies in marketing a product, usually banners are found on the edge of the highway or stalls.

6. **Billboards**

Billboard is a form of promotion of outdoor advertising with large sizes. It can also be said that billboards are larger poster shapes that are placed high in certain places where people are busy.

7. **Banner**

The development of digital printing technology makes X-Banner quite popular in use today. It is produced with a Flexi engine, the X-Banner produces pretty good quality but at an affordable price.

8. **Flyer**

A flyer is another designation for brochure, pamphlet, or booklet. It is an intermittent publication that can consist of one to a small number of pages, is not related to other issues and is finished in one issue.

9. **Business Card**

Business cards can be considered important when we will highlight our profile or our work, which sometimes cannot be presented in detail through a cell phone, Smartphone.

10. **Print media**

Print media are mass media in the form of printing which can be enjoyed by reading and static media forms. That is this media with a printed form in which, generally, the fastest publishing once a day with the writing system

in dept (more in-depth and complete). Types of Print Media, namely:

11. **Ambient**

Art Ambient media or Ambient Art is one form of new media in advertising. Ambient media tries to play the emotions of the target audience by utilizing the atmosphere and elements of the public space around the media displayed.

12. **Flash mob**

Flash mob is a movement that is done by a group of strangers who suddenly gather in a public place, do something unusual for a few minutes, and then just disperse. This activity is usually organized only through social media sites, email or other media.

13. **Social Media**

Social media is an online media, with users, can easily participate, share, and create content including blogs, social networks, wikis, forums, and the virtual world. Blogs, social networks, and wikis are the most common forms of social media used by people all over the world.

2.4. Marketing Strategy Management

Kotler and Armstrong (2009) Marketing Management is the analysis, planning, implementation, and control of programs designed to create, build, and maintain profitable exchanges with targeted buyers, to achieve company goals. Kotler also explained marketing is a social process, where individuals and groups get what they need, and they want by creating and maintaining products and values with other individuals and groups.[15].

III. RESEARCH METHODS

3.1 Method of collecting data

a. Observation

Observation is a method of collecting data through direct observation or careful in the field or research location. In this case, researchers guided by the research design need to visit the research location to directly observe various things or conditions that exist in the field. Through observation, the writer can see and observe directly and can gather the information that might not be obtained during the interview. By making observations also the author can see the conditions and problems that exist in the environment.

b. Literature Review

It is a stage of data collection by collecting and studying various references from previous journals concerned with the problem to be examined.

3.2. C45 algorithm

C45 algorithm is an algorithm that is widely known and used for data classification that has numerical and categorical attributes. The results of the classification process in the form of rules can be used to predict the value of the discrete type attribute of the new record. C45 algorithm itself is a development of the ID3 algorithm, where the development is done in terms of being able to overcome missing data, continuous data, and pruning.[16]

In general, the C45 algorithm for building decision trees is as follows:

1. Select the attribute as the root
2. Create a branch for each value
3. Divide cases in branches
4. Repeat the process for each branch until all cases in the branch have the same class

To select the root attribute based on the highest gain value of the existing attributes. To calculate the gain use the formula as stated below:

$$Gain(S, A) = Entropy(S) - \sum_{i=1}^n \frac{|S_i|}{|S|} * Entropy(S_i)$$

Information:

- S : Case set
- A : Attribute
- n : Number of attribute A partition
- |S_i| : Number of cases on partition - i
- |S| : Number of cases in S

Meanwhile, the entropy value calculation can be seen in the following equation:

$$Entropy(S) = -\sum_{i=1}^n p_i * \log_2 p_i$$

Information

- S : Case set
- A : Attribute
- n : number of partitions S
- p_i : the proportion of S_i to S

This study uses six criteria that serve as benchmarks in the classification of promotional media in the Ogan Komering Ulu Timur district, following a table of criteria used:

Table 1. Criteria

Code	Criteria
C1	Internet Service Availability
C2	Availability of Electric Service
C3	Community Work
C4	Community Income
C5	Community Education
C6	District Government Access

IV. RESULTS

After determining the criteria that will be used as a benchmark in the classification of promotional media, the next step is to form a prediction decision table, the following is a prediction table for the classification of promotional media.

Table2. Prediction of Promotion Media Classification

Internet Service Availability	Availability of electrical Services	Community work	Community Income	Education	District Government Access	Target
Less available	Available	Labor	Low	Primary/Secondary School	Much	Print
Highly Available	Available	Self employed	Are	High School	Near	Media Online
Less available	Available	Honorary Officer	Are	Diploma/Bachelor	far	Media Electronics
Available	Less available	Labor	High	High School	Very far	Media Online
Less available	Less available	Honorary Officer	Are	Diploma/Bachelor	Much	Print Media
Available	Highly Available	Honorary Officer	Are	Diploma/Bachelor	Near	Media Online
Less available	Available	Labor	Are	Primary/Secondary School	Much	Media Electronics
Available	Available	Labor	Low	High School	Much	Print
Less available	Available	Self employed	Low	High School	Very far	Print
Available	Available	Self employed	High	Primary/Secondary School	Very far	Media Online

Furthermore, the formation of the decision tree, the decision tree is formed after the node is calculated to determine the *Entropy* value of each attribute and the gain value. This can be seen in the node table below:

Table3. Node 1

	Amount (S)	Print (S1)	Media Electronics (S2)	Media Online (S3)	Entropy	Gain
Total	10	4	2	4	1.521928095	

Internet Service Availability						0.687877451
Highly Available	1	0	0	1	0	
Available	4	1	0	3	0.853282488	
Less available	5	3	2	0	0.985475297	
Availability of electrical Services						0.37414833
Highly Available	1	0	0	1	0	
Available	7	3	2	2	1.449860916	
Less available	2	1	0	1	0.664385619	
Community work						0.532472543
Honorary Officer	3	1	1	1	0.996578428	
Self employed	3	1	0	2	0.796578428	
Labor	4	2	1	1	1.128771238	
Community income						0.891446071
High	2	0	0	2	0	
Are	5	1	2	2	1.260964047	
Low	3	3	0	0	0	
Education						0.552472543
Diploma/Bachelor	3	1	1	1	0.996578428	
High School	4	2	0	2	0.928771238	
Primary/Secondary School	3	1	1	1	0.996578428	
District government Access						0.790216918
Near	2	0	0	2	0	
Much	5	3	2	0	0.985475297	
Very far	3	1	0	2	0.796578428	

After calculating the node 1 and knowing the value of each attribute and the highest gain, then node 1.1 is calculated as a branch node. After calculating node 1.1 and knowing the value of each attribute and the highest gain, then the node 1.1.2 is calculated as a branch node. After the node calculation is complete, the decision tree is formed based on the results of the node calculation. The following decision tree is formed from the results of the node calculation above.

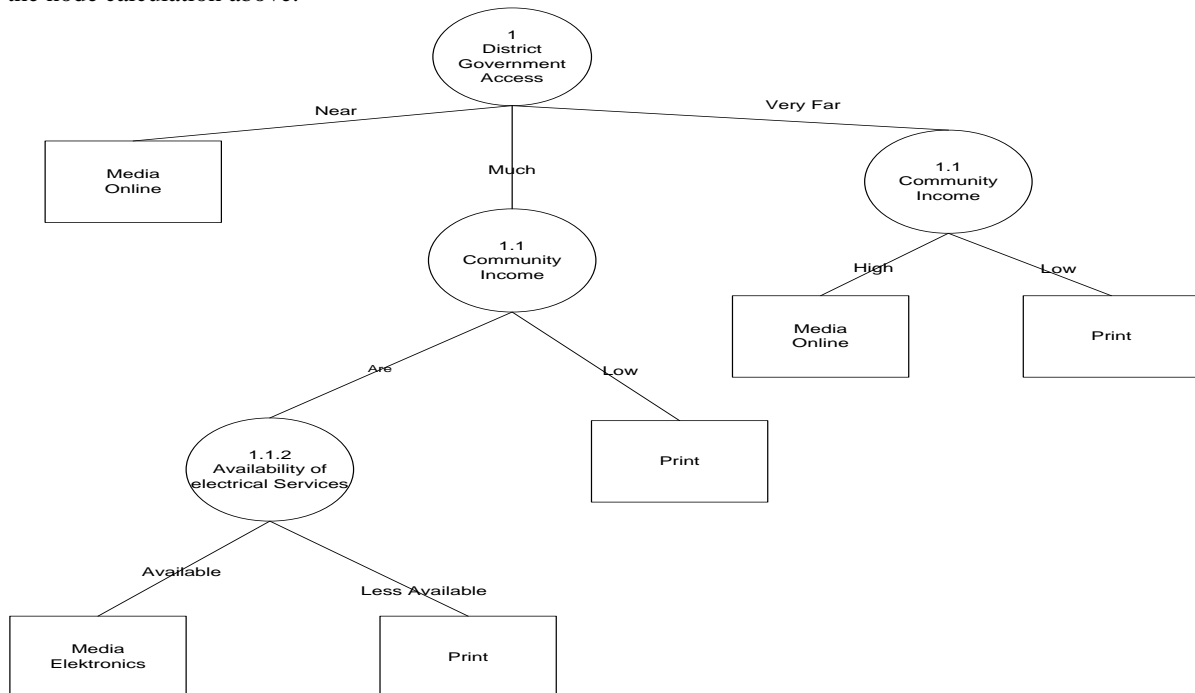


Figure1. Decision Tree Results

Based on the calculation of the node, it is obtained that the decision tree of the classification results of tertiary media promotion media is strongly affected by the district government access as follows:

1. If the government access is close then the promotional media used is online media
2. If the government access is very far, then it can be seen from the people's income
3. If the community income is high then the promotional media used is online media
4. If the income is low, the promotional media used is print media
5. If the government access is far and the income of the community is medium, then the electricity service can be seen
6. If the government access is far, the income of the community is medium and electricity services are available then the promotional media used is electronic medias
7. If the government access is far, the income of the community is medium, and the electricity service is not available then the promotional media used is print media

V. Conclusion

5.1 Conclusion

Based on research conducted using the C45 Algorithm method to classify media promotion of private college institutions can be used as a solution in solving the problem of classification of promotional media according to the target area of promotion appropriately. By applying the six criteria that serve as a reference benchmark for existing classifications such as the availability of internet services, the availability of electricity services, community work, community income, education, and access from the territory to the District Government. The process of classifying promotional media can be done appropriately.

5.2 Suggestion

In this study researchers only used six criteria. As for suggestions for future researchers, this research can still be developed further by adding attributes or using other methods.

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