

# Determination of Marketing Strategies on Telecommunication Industry Using Analytic Hierarchy Process (AHP)

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**Abstract.** The community's need for telecommunications services is inseparable from everyday life. With the existing sophistication, the people of Ambon City want access to information that is diverse, easy, fast, and reliable. PT. Telkom Indonesia Tbk., Ambon is one of the state-owned companies engaged in telecommunications. To compete in the development of internet-based access and technology, PT. Telkom Indonesia Tbk., Ambon must make promotional programs that are attractive, informative, communicative, affordable, persuasive, and memorable. Using the Analytic Hierarchy Process method results in a presentation on the priority of promotional programs, namely, Promotion on Radio (17.9%), Festival (13.7%), Door To Door Marketing (12.9%), Open Table (12.7%) , Website Promotion (11.2%), Advertise “add lips” on Radio (11.1%), Install Billboards (8.8%), Promotions with Banners (6.5%), and Advertisements in Newspapers (5.2 %).

## 1. Introduction

The development of internet-based technology and network access technology in Indonesia is rapid [1]. Society nowadays need access to informations that are diverse, easy, fast, and reliable. PT. Telkom Indonesia Tbk. is an Indonesian state owned enterprise (BUMN) in the field of telecommunications with an internet product named IndiHome. The technology used by Telkom in its superior products have access speeds up to 100 Mbps and remain stable in weather disturbances [2]. In a competitive market, customer satisfaction is seen as the main differentiator and has become crucial to business strategy in competition between fixed broadband companies in Indonesia [3].

Marketing in promotion is an activity to provide information to prospective customers about the existence of a company's products [4]. Communicating with prospective customers is the best alternative in a promotion. In addition to introducing products that are sold, promotion is also a process of believing prospective customers to buy or use products offered [5]. So to attract the interest of IndiHome prospective customers in Ambon City, PT. Telkom Indonesia Tbk., Ambon must establish promotional programs that are attractive, informative, communicative, affordable, persuasive, and memorable. Based on these diverse criteria, promotional programs are carried out in various ways, such as through print media, electronic media, and directly with the help of Sales Promotion [6]. The purpose of this study is to get the priority of effective promotional programs to be run using the Analytic Hierarchy Process (AHP) method.

Analytic Hierarchy Process (AHP) is a decision-making method that was first introduced by Saaty in 1970[7]. AHP is a decision-making method to prioritize alternatives when many criteria must be considered[8]. This method is used for relative measurements which are seen from the proportions

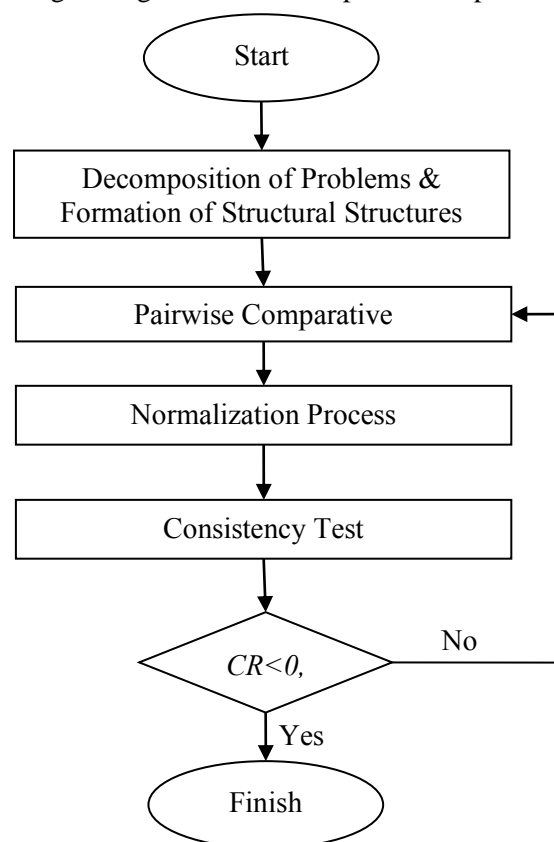


available for consideration. So to obtain decisions in solving complex unstructured problems, this method simplifies with a hierarchy (Decomposition), compare and give numerical values objectively which represent the meaning of the importance of the variable (Comparative Judgment) and test the consistency of the value (Local Consistency) [9][10].

## 2. Research Methods

This study will discuss the forming of a promotion program strategy with priority values obtained on consideration with the AHP method. The data used in this study are quantitative data obtained from the results of interviews with the Head of Promotion of PT. Telkom Indonesia Tbk., Ambon. The data is comparative assessment data paired with priority scale according to Saaty for a hierarchy of criteria and alternative hierarchy[11]. There are also stages of research used in this study are like in Fig. 1, as follows:

- 1) Decomposition of the problem and determine the solution to achieve.
- 2) Form a hierarchical structure that begins with general objectives, criteria, and alternatives.
- 3) Form a pairwise comparison assessment matrix that describes the priorities of each variable that is compared.
- 4) Normalizing the data by dividing the value of each element in the comparison matrix in pairs with the sum of the column values.
- 5) Perform consistency test by looking for the maximum eigenvector value to get the Consistency Index and Consistency Ratio values. At this stage, if it is inconsistent, the assessment of pairwise comparisons needs to be reviewed.
- 6) Repeat steps 3, 4, and 5 for all levels of the hierarchy.
- 7) Synthesize choices and prioritize elements at the lowest hierarchy level until goal attainment. This step is done by calculating the eigenvalue of each paired comparison.

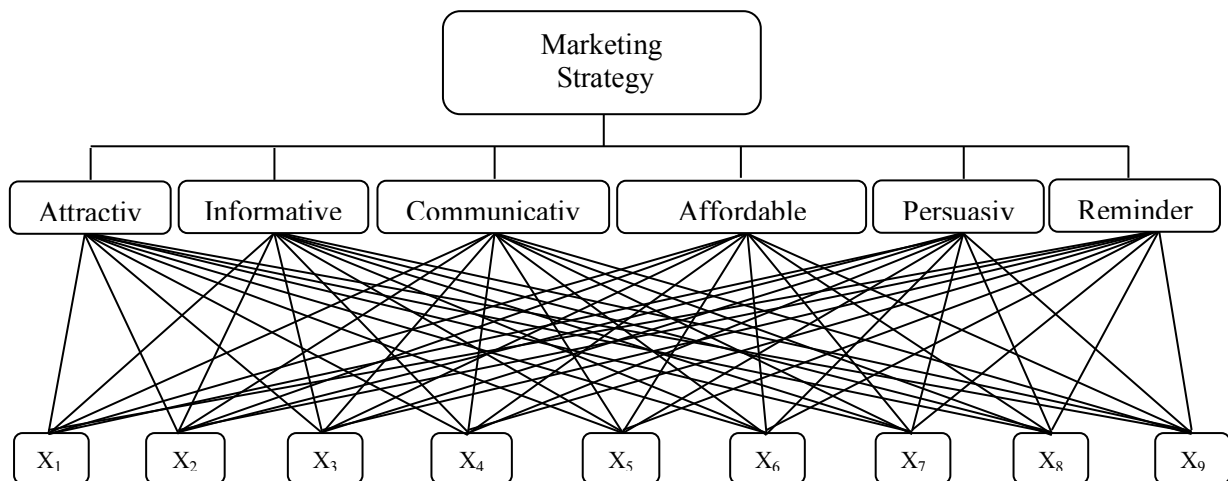


**Figure 1.** Flow Chart of Data Analysis

### 3. Results and Discussion

The solution to a problem using AHP is to arrange it in the form of a hierarchy. In this study, the strategy of the promotion program that will be formed consists of 3 levels of hierarchy, namely general goals, criteria, and alternatives. The hierarchical structure in this study can be seen in Fig. 2 with alternative promotional programs owned by PT. Telkom Indonesia Tbk Ambon is as follows:

- 1) "Add lips" advertisement on Radio ( $X_1$ )
- 2) Advertising in Newspapers ( $X_2$ )
- 3) Billboards Instalments ( $X_3$ )
- 4) Promotions with Banners ( $X_4$ )
- 5) Door To Door Marketing ( $X_5$ )
- 6) Open Table ( $X_6$ )
- 7) Festival ( $X_7$ )
- 8) Website Promotion ( $X_8$ )
- 9) Promotion on Radio ( $X_9$ )



**Figure 2.** Hierarchical Structure for Promotion Program Analysis

The hierarchical structure aims to look at the interrelationships of each level of the hierarchy for assessment of pairwise comparisons. Weighting on this method is done by the normalization process. The result of the normalization process is the Eigen vector value as the priority weight of each hierarchy relative. So that the relative priority weights generated for the criteria hierarchy like in Table 1 and alternative hierarchy like in Table 2, are as follows:

**Table 1.** Eigen Vectors of the Criteria Hierarchy

Criteria	Weight
Attractive	0.332
Informative	0.108
Communicative	0.184
Affordable	0.209
Persuasive	0.027
Memorable	0.140

**Table 2.** Eigen Vector of the Alternative Hierarchy

Alternatives	Criteria					
	Attractive	Informative	Communicative	Affordable	Persuasive	Memorable
X <sub>1</sub>	0,143	0,130	0,136	0,054	0,061	0,086
X <sub>2</sub>	0,041	0,098	0,026	0,054	0,077	0,068
X <sub>3</sub>	0,026	0,069	0,029	0,149	0,100	0,234
X <sub>4</sub>	0,039	0,081	0,042	0,054	0,100	0,150
X <sub>5</sub>	0,183	0,098	0,152	0,074	0,153	0,073
X <sub>6</sub>	0,183	0,081	0,180	0,041	0,197	0,073
X <sub>7</sub>	0,183	0,081	0,237	0,041	0,189	0,073
X <sub>8</sub>	0,039	0,098	0,039	0,288	0,060	0,136
X <sub>9</sub>	0,163	0,263	0,159	0,244	0,063	0,108

The advantage of the AHP method is the consistency test on comparative assessment data. A consistency test is carried out to check the consistency of the assessment in the given comparison matrix. Determines the tolerance of consistency deviation by 10% ( $CR < 0.1$ ) [12]. Consistency values are determined based on the value of Consistency Ratio (CR), so the results of consistency tests in each hierarchy are as follows:

- 1) Assessment for all criteria,  $CR = 0.083$
- 2) Alternative assessments based on attractive criteria,  $CR = 0.089$
- 3) Alternative assessments based on informative criteria,  $CR = 0.090$
- 4) Alternative assessments based on communicative criteria,  $CR = 0.093$
- 5) Alternative assessments based on affordable criteria,  $CR = 0.091$
- 6) Alternative assessments based on persuasive criteria,  $CR = 0.087$
- 7) Alternative assessments based on memorable criteria,  $CR = 0.093$

Because all CR values  $< 0.1$ , it can be concluded that the assessment given in the pairwise comparison matrix of each hierarchy is consistent. So, this research can be continued in the next stage.

To get a total ranking or priority for promotional programs as a marketing strategy "PT. Telkom Indonesia Tbk Ambon", the next step is multiplying eigenvectors of the alternative hierarchy with eigenvectors of the criteria hierarchy. The results of the synthesis of alternative priorities like in Table 3, are as follows:

**Table 3.** Results of Alternative Priority Synthesis

Priority	The Promotion Programs (Alternative)	Weight
1	Promotion on Radio( $X_9$ )	0,179
2	Festival ( $X_7$ )	0,137
3	Door To Door Marketing ( $X_5$ )	0,129
4	Open Table ( $X_6$ )	0,127
5	Website Promotion ( $X_8$ )	0,112
6	“Add lips”advertisement on Radio ( $X_1$ )	0,111
7	Billboards Instalments( $X_3$ )	0,088
8	Promotions with Banners ( $X_4$ )	0,065
9	Advertising in Newspapers ( $X_2$ )	0,052

#### 4. Conclusions

The Analytic Hierarchy Process method in forming a marketing strategy for "PT. Telkom Indonesia Tbk., Ambon" resulted in a presentation on the priority of promotional programs namely, Promotion on Radio (17.9%), Festival (13.7%), Door to Door Marketing (12.9 %), Open Table (12.7%), Website Promotion (11.2%), “Add lips” advertisements on Radio (11.1%), Billboards Instalments (8.8%), Promotions with Banners (6.5 %), and Advertisements in Newspapers (5.2%).

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