

Comparative Analysis of Customer Satisfaction Using The Bandwidth Method Between Coaxial Cables and Fiber Optic Cables PT. Tbk Linknet

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Abstract

This research aims to analyze the comparison of customer satisfaction between the use of coaxial cables and fiber optic cables in PT.LinkNet using the Bandwidth method. The Bandwidth method was used to evaluate network performance and the quality of service received by customers. Data was collected through customer satisfaction surveys covering aspects of service reliability, speed, stability and price. The analysis results indicate a notable difference in customer satisfaction levels between the two types of cable. Fiber optic cables received higher satisfaction ratings compared to coaxial cables. The results shows that the average satisfaction score for fiber optic cables was 4.7 out of 5, whereas coaxial cables received an average score of 3.9 out of 5. This difference is significant since evidenced by a p-value of less than 0.01, confirming that the higher satisfaction with fiber optic cables is not an outcome of random variation. These findings can provide input for PT Link Net in improving service quality and choosing the right technology to meet customer needs.

Keywords: Bandwidth Method, Coaxial Cable, Customer Satisfaction, Fiber Optic Cable, PT.LinkNet

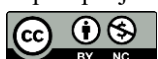
1. Introduction

PT.LinkNet, founded in 1996 as PT Seruling Indah Permai and changed name in 2000, has develop fast in the field technology information and internet services. Initially engaged in trade goods and services, companies switch to technology information in 2000, and expand business in 2011 and 2019 to communication cable, multimedia services, internet provision, trade, and consulting business. Now, PT Link Net is provider high-speed broadband internet service high in Indonesia, and similar with PT First Media Television for service television contracts and data. Both companies were operate advanced HFC and FTTH systems supporting 870 MHz broadband service direction serve various city big in Indonesia with quality internet tall (<https://www.linknet.co.id/> 2000).

The objective of this study to analyze comparison between speed transmission coaxial and fiber optic cables in order to increase customer satisfaction for using service from PT.LinkNet. The study also involving problem identification, data

collection, analysis results, and testing study previously relevant For produce comprehensive insight. Several number of previous studies also used for comparison between coaxial cable and cable fiber optics for speed communication (Silalahi 2023).

PT.LinkNet. curenly replace network access copper local with fiber optics due to the network access copper only capable transmit up to 4 Mbit/s and requires modernization. The purpose is to distributes bandwidth up to 100 Mbit/s using Gigabit Passive Optical Network (GPON) technology (Maulana et al., 2023), (Adiati, Kusumawardhani, and Setijono 2022). Optical Line Terminal (OLT) which is a sub system from Optical Access Network based Passive Optical Network (PON) technology, works as between advance central with connected network to One or more network distribution optics. In principle, Passive Optical Network (PON) is one type fiber optic technology that uses configuration point to



multipoint system (Fariky and Hartono 2023), (Satriadi and Pramudita 2021).

2. Methodology

The analysis of fiber optic cables and coaxial cables is detailed in the flow chart below. This includes the standardization of QoS (Quality of Service) parameters to strengthen the ongoing research. Regarding the study stages, the analysis of fiber optic cables and coaxial cables is depicted in the following flow chart. Thus, incorporating standardized QoS (Quality of Service) parameters to enhance the ongoing research efforts (Wenas Ongkowinoto 2020), (Wismiana et al. 2021), (Musmuharam and Eko Suharyanto 2020).

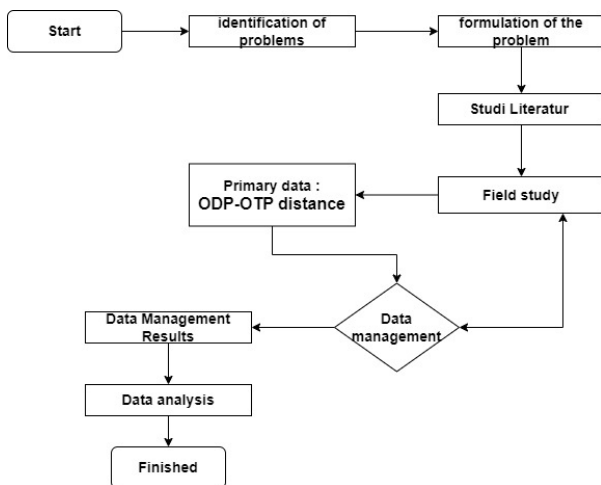


Figure 1. Flowchart

- 1) In the identification process problems with assignments end this obtained from various reference in the form of a number of journal that discusses about fiber optic cables and coaxial cables. Especially on service internet users who with prover PT.LinkNet. This serves as the initial basis to formulate relevant and acceptable titles for the final assignment, which will be discussed in the assignment end this.
- 2) At stage furthermore will done studies literature For get Suite activity search and study from relevant sources and as well become reference in writing task end this is so you can produce complete and reliable information.
- 3) Stage furthermore that is studies field carried out For obtain research data in a way direct Where writer do a number of activity For get the expected data For strengthen study this, with method look for a number of reference

journals, interviews and taking application data ticket from that used by PT.LinkNet For respond obstacles experienced by users internet service for as material study .

- 4) After some reference got from a number of source obtained from journal researcher continue to processing of the data obtained from PT. LinkNet as base The result will be discussed in the end of assignment.
- 5) Analysis was carried out to find out which cables are frequently disturbance to customer.
- 6) Data management results: The data obtained will be used determined the best analysis

2.1 Bandwidth Testing

Method research used method bandwidth testing direct with monitor chart internet speed used from two different cables that is fiber optic cables and coaxial cables. From this data is taken between speed download and upload of each will get the average value of bandwidth usage used by users (Prihantoro, Hidayah, and Fernandez 2021), (Hidayatulloh and Rifa'i 2020), (Sufandi et al. 2023).

This is example of internet speed from PT.LinkNet as comparison between internet speed coaxial and optical cables.



Figure 2. The result of Coaxial Cable internet speed

From Figure 2 you can seen result check Internet speed in Mbps. that can We know resulting speed that is for DOWNLOAD 29.2 Mbps and UPLOAD 35.0 Mbps. from the data obtained We can know internet speed with use coaxial cable (Nurcahyo, Forgia, and Mustaqim 2021), (Prayoga 2021).



Figure 3. Optical Cable internet speed results

From Figure 3 it can be seen that Internet speed in Mbps. the results obtained are great Far with those who use it cable coaxial from results We can know DOWNLOAD results are 62.3 Mbps and for UPLOAD 64.6 Mbps from here We can see quite a difference Far (Ponco et al. 2021), (Eriyadi 2023).

2.2 Table Application Tickets

The application ticket was used is used for data collection used by Linknet. The data was needed in order to obtained about 10,000 records. Due to large data, the study only can present 10 data for analysis (Wildan 2022), (Fauzi and Suryadi 2020).

Table 1. Application Table Tickets Pt.LinkNet

Tickets	Trouble	Problem	Cable	Setatus Tickets	Time
10746827	Dead	Tv+Inter net	HFC	Closed	1 hour
10746821	connections	Internet	HFC	Closed	58 Minutes
10746802	Amplifier	Tv+Inter net	FTTH	Closed	48 Minutes
10746800	Lost Service	Tv+Inter net	HFC	Closed	45 minutes
10746775	MCB	Tv+Inter net	HFC	Closed	1:24Minutes
10746768	MCB	Tv+Inter net	HFC	Closed	2:15 Min
10746762	MCB	Tv+Inter net	FTTH	Closed	1:04 Min
10746749	PowerSPY	Internet	FTTH	Closed	2:45 Min
10746746	PowerSPY	Internet	FTTH	Closed	1:06 Min
10746742	Fiber Cable	Internet	HFC	Closed	4::28 Min

3. Results and Discussion

table 1 shows that, there is data regarding ticket service related problem cable HFC and FTTH networks (Sutrisno and Peby Wahyu Purnawan 2020). Most of the ticket show problems with TV and internet, with various type problem

like totally dead, problem connections, amplifiers, and losses service. There are also some related problems with MCB and PowerSPY. Tickets This part big has resolved with status "Closed", shows that all problem has been handled. Completion time problem varies, starting of 45 minutes until more from 4 hours, with most ticket resolved in time not enough from 2 hours. Problem with time solution longest is related with fiber cables on HFC networks, which consumes time 4 hours and 28 minutes. Overall the efficiency team in handle various problem TV and internet services with time relative solution can be seen fast (Utami, Rahmayanti, and Azyati 2022), (Maria et al. 2022). The analyze of optical dan oaxial cables as follows

a. Analysis Fiber optic network

Problem Slow Fiber Network: One frequent problem complained by customers is internet speed is not stable or slow, especially during rush hour. This matter can caused by many factors, incl burden high traffic and poor infrastructure adequate. Frequent Errors Apart problem speed, customers are also frequent complained an error occurred in the fiber network. Problem This Can in the form of a sudden disconnect or other disturbances that result internet connection lost.

Many Complaints: The height amount complain from customer show exists dissatisfaction to services provided. Complaint This usually related with speed, stability, and response to disturbance.

Fiber Network Conditions and Schemes Fiber optic networks on LinkNet generally consists from structure FTTH (Fiber to the Home) (Maria et al. 2022). Topology which allows data transfer with speed tall. Infrastructure This includes the network backbone main link various distribution nodes to customer end.

Satisfaction Customer to Based Fiber Network survey, satisfaction customer to fiber network on LinkNet show varying results. Temporary Lots customer appreciate speed and capacity fiber network, there are also those who complain stability and frequent interruptions happen.

b. Analysis Coaxial Network

Problem Slow Coaxial Network: Problem speed also occurs on coaxial networks, though Possible No common on fiber networks. However, the speed is more low compared to fiber become complaint main. Frequent Errors Coaxial networks also experience error

problem, though with type different disorders, such as interference more signal tall. Lots of Complaints: Same as fiber network, coaxial network also accepts Lots complaints, esp related with quality signal and stability connection.

Analysis Coaxial Networks on LinkNet Coaxial Network Conditions and Schemes Coaxial networks on LinkNet use combined HFC (Hybrid Fiber-Coaxial) (Arifianti, Isnomo, and Koesmarijanto 2020). infrastructure fiber optic and coaxial cables. Although technology This more old compared to fiber optics pure, still HFC Lots used Because his abilities For accommodate technology upgrades.

Satisfaction Customer to Coaxial network. Customer Inclined coaxial network provide more feedback negative compared to customer fiber networks, especially related with speed and stability connection. However, some customer still feel satisfied with service This Because wide coverage and more price affordable.

The comparison table between fiber optic and coaxial networks is shows as follows : (JOKO MAULANA IBRAHIM 2023)

Table 2. Comparison Table Network cable

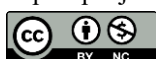
Aspect	Optical Fiber	Coaxial
Speed	Fast	Relatively Fast
Stability	Stable	Less Stable
Infrastructure	FTTH	HFC
Satisfaction	Very satisfied	Satisfied
Cost	More expensive	Affordable

4. Conclusion

From the results analysis above, can concluded that although fiber network offers more speed and stability, there are many complaints related to frequent interruptions. Specifically, the average download speed on the fiber network was measured at 100 Mbps with a stability rate of 95%. However, users reported interruptions occurring 2-3 times per week. On the other hand, coaxial networks, though more affordable and covering a broader scope, face more frequent issues with stability and signal quality. The average download speed on the coaxial network was measured at 50 Mbps, but the stability rate was only 80%, with interruptions occurring 5-6 times per week. PT.LinkNet need increase quality service on both type network This For increase satisfaction customer.

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