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Management Performance Quality Levels Volce and Data to Increase Customer Satisfaction With the Methods Drive Test

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Abstract

PT. Telkomsel ins a company engaged in telecommunication, where to keep the quality in order to keep good then PT. Telkomsel is always trying to provider a satisfactory service to its customers by way of always checking the real signal routine or drive test. The addition of 3G BTS aims to provide service that are always better and faster. Comparison of 2G coverage and 3G coverage which is can be perceived by customer is the quality value of level 3G Voice in much better compared to the value of level 2G Voice. So is on the data services access speed data 3G much better and rapid compared with access speed data 2G. The location of this 3G BTS addition on site KKO Usman Badarudin, drive test performed on the side of the Voice and Data Service. PT. Telkomsel has standards for the value of a good voice -10 dBm up to -85 dBm, for a value of 2G data access speed is 56 Kbps up to 256 Kbps while the 3G data access speeds of 380 Kbps up to 1200 Kbps. Factors affecting the best level value received signal voice good for 2G not for 3G is the distance between antenna to the measurement. That affect the value of the data access speed is good/fast and slow/bad is the duration of the access data.

Keywords : *Planning New Site, Maintenance Performance, Drive Test, Received Level Voice, Speed Data Access*

1 INTRODUCTION

Any telecommunication operators must provide services diverse and innovate and must remain regard to the signal to a regular customer feel comfortable. A factor that plays an important role in maintaining the stability and progress of the service is to continue to do the addition of 3G BASE STATIONS in order to increase capacity and expand coverage.

Based on the above issues and background can be the identification problem is due to the frequent occurrence of complaints from customers regarding the quality of performance for less the maximum quality level of voice and data access speed at the Usman Badarudin KKO on Ilir Timur 2.

Limit Problem :

Table 1: Table of Initial Condition Design Network

Generasi Kedua(2G)	**Generasi Ketiga(3G)**
Service Voice, SMS, Data	Service Voice,Video,SMS,Data
Only Support Satu Cell Layer	Support multi Cell Layer
Could do only one service alternately	can browse the phone simultaneously
Speed data 9,6 256 kbps	Speed data 144 kbps 2Mbps
Fekuensi 900-1800 Mhz	Frekuensi 1900-2100 MHz
Application data using GPRS-EDGE	Application data using WCDMA- HSDPA

1. The measurement of drive test using only TEMS Investigation 10.0.3
2. The measurement of drive test only to the operator telkomsel
3. The location of measurement only on coverage area KKO Usman Badarudin at Ilir Timur 2
4. The measurement is done at the level of the signal quality of voice and data access speed

The problem that becomes the object of research and development of this thesis is to know the level of voice signal quality and speed of data access in the area of coverage at Badarudin Usman KKO on Ilir Timur 2 and measurement method using the method of Drive Test using the tools/tools TEMS Investigation10.0.3.

The purpose of this thesis is measuring and computing parameter - parameter drive test quality signal operator Telkomsel on level voice the quality and speed access data on coverage area KKO Usman Badarudin on Ilir Timur 2.

Generation telecommunication developments, Comparisons between service generation to two (2G) and (3G) is the third generation.

2 RESULTS AND DISCUSSION

2.1 Calculation

$$Path\ Loss\ (dB) = 32,45 + 20Logd(Km) + 20Logf(MHz) \tag{1}$$

$$EIRP\ (dBm) = TxPower(dBm) + GainAntenna(dBi)CableLoss(dB) \tag{2}$$

$$Cable\ Loss = (Nilai\ Loss\ feeder\ x\ Panjang\ Feeder) + (Nilai\ Loss\ Connector\ dan\ Jumper\ x\ Banyak \tag{3}$$

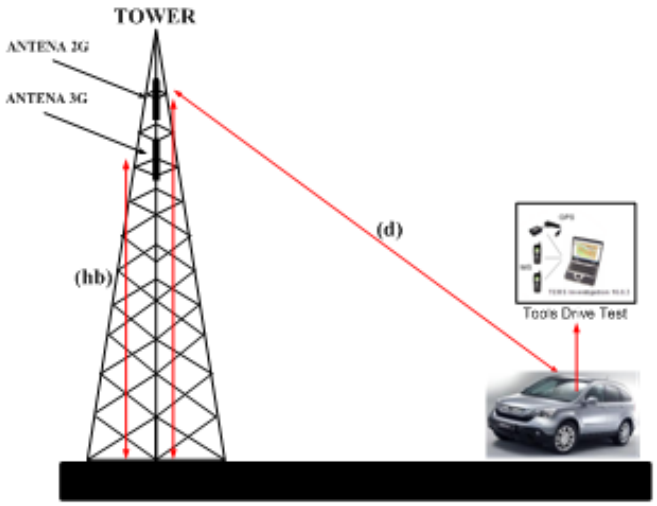

Figure 1: Examples of image presentation

$$Rx\ Level\ (dBm) = EIRP - wall\ loss - body\ loss - path\ ossfading\ margin) \tag{4}$$

$$RSCP\ (dBm) = EIRP - wall\ loss - body\ loss - path\ loss - fading\ margin) \tag{5}$$

$$Kecepatan\ Data = \frac{Jumlah\ File\ Transfer\ (bit\ per\ detik)}{Waktu\ (detik)} \tag{6}$$

Results measurement & calculation of Received Signal Level Voice of 2G and 3G. Show in Table 2.

2.2 Analysis measurements & calculations Received Signal Voice 2G and 3G

1. For a comparison of calculation and measurement of signal level values 2G voice all sectors and different distances, a signal level values voice 2G (good), except for the measurement of sector 3 and 0.95 Km value of -90 dBm (enough). So the closer position of distance measurements to the location of the site then the signal level of the voice will be the better.

2. For comparison calculation and measurement value signal level voice 3g all sector and different distances, enters at the category of good

3. For a comparison of measurements of 2G and 3G is the value of the received signal level voice entered on categories of Good except for the measurement of 2 g for sector 3 and 0.95 km value -86 dBm enters at the category of enough.

Table 2: Result measurement & calculation of Received Signal Level Voice of 2G and 3G

No	Location	Distance/km	Received Signal Level Voice (dBm)			
			Measurement		Calculation	
			2G	3G	2G	3G
1	Sector 1	0,45	-77	-72	-57	-62
2	Sector 1	0,87	-80	-80	-61	-68
3	Sector 2	0,52	-68	-72	-57	-63
4	Sector 2	0,74	-73	-75	-60	-66
5	Sector 3	0,37	-61	-71	-54	-60
6	Sector 3	0,95	-86	-77	-62	-69

Table 3: Standard PT. Telkomsel

Interval (dBm)			Katagori
-120,0	$<= x <$	-95,0	Bad
-95,0	$<= x <$	-85,0	Enough
-85,0	$<= x <$	-10,0	Good

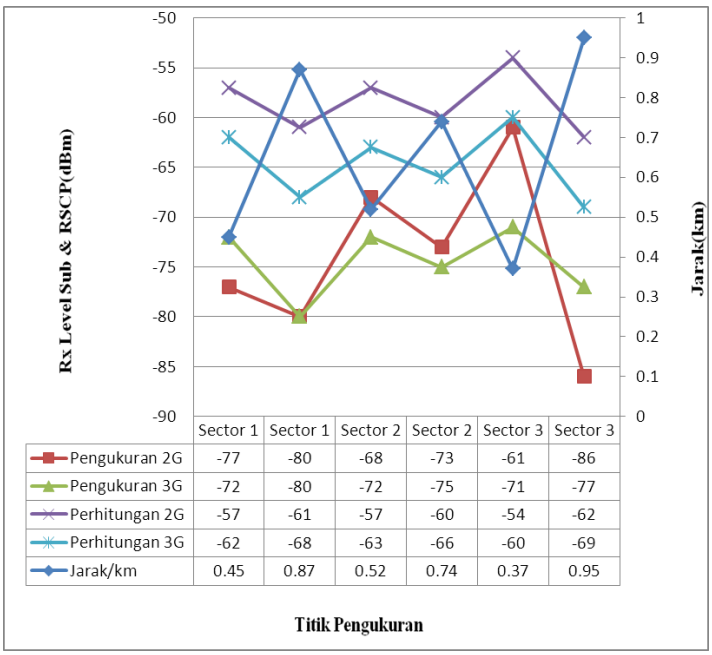

Figure 2: Results measurement & calculation of Received Signal Level Voice of 2G and 3G

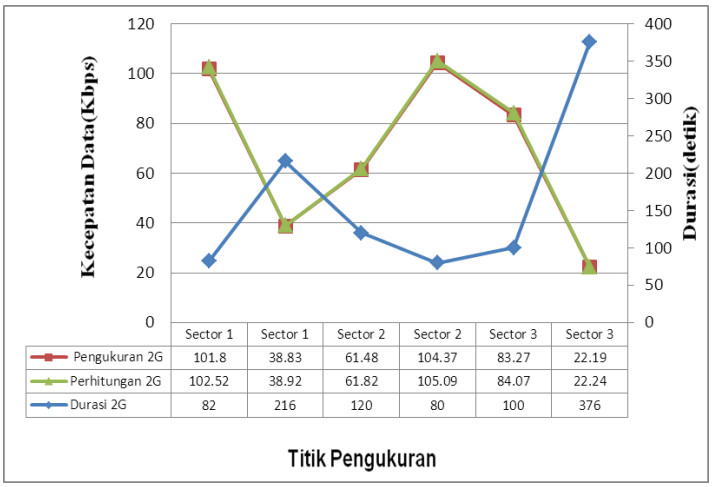

Figure 3: RGraphic of measurements and calculations of the number of files 2G Data Speed 1 MB

Table 4: Results of measurements and calculations of the number of files 2G Data Speed 1 MB

No	Location	Duration	Speed Data 2G 1 MB		The number of files(Bit)
		2G	Measurements 2G	Calculations 2G	
1	Sector 1	82	101,8	102,52	8406848
2	Sector 1	216	38,83	38,92	8406848
3	Sector 2	120	61,48	61,82	8406848
4	Sector 2	80	104,37	105,09	8406848
5	Sector 3	100	83,27	84,07	8406848
6	Sector 3	376	22,19	22,24	8406848

4. For a comparison of calculation of 2Gand 3G voice level of the received values entered on categories of Good

5. Overall results of measurements and calculations of 3G is better than the measurement and calculation of 2G.

6. Factors affecting the value of both bad value received the level of signals voice is the distance between antenna to the location of measurement.

2.3 Analysis of measurement & calculation of 2G and 3G Data Speed 1 MB

1. For the calculation and measurement of 2G all sectors in categories Good, unless the sector 3 data 376 seconds duration, then the calculation value 22, 24 Kbps and mea-

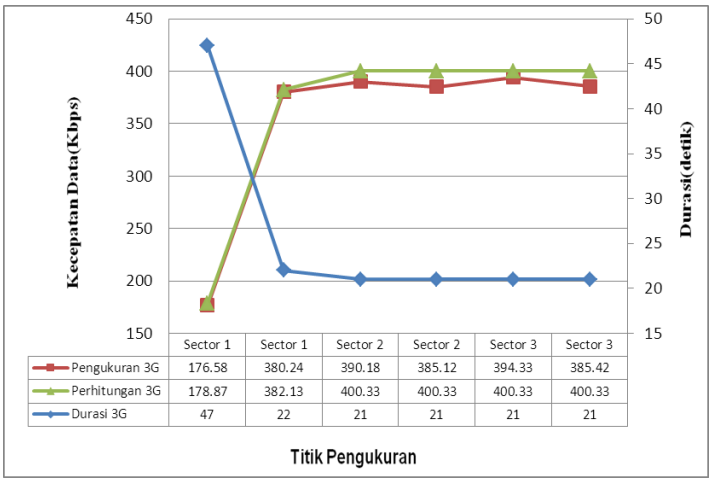

Figure 4: Graphic of measurements and calculations of the number of files 3G Data Speed 1 MB

Table 5: Standard Speed Data 2G

Interval (Kilobit/sekon)	**Category**
0 35	Bad
36 50	Enough
51 - 100	Good
101 - 256	Excellent

Table 6: Results of measurements and calculations of the number of files 3G Data Speed 1 MB

No	Location	Duration 3G	Speed Data 3G 1 MB		The number of files(Bit)
			Measurements 3G	Calculations 3G	
1	Sector 1	47	176,58	178,87	8406848
2	Sector 1	22	380,24	382,13	8406848
3	Sector 2	21	390,18	400,33	8406848
4	Sector 2	21	385,12	400,33	8406848
5	Sector 3	21	394,33	400,33	8406848
6	Sector 3	21	385,42	400,33	8406848

Table 7: Results of measurements and calculations of the number of files 3G Data Speed 1 MB

Interval (Kilobit/Sekon)	Category
64 - 128	Bad
129 - 379	Enough
380 -1200	Good
$>$ 1200	Excellent

surement 22,19 Kbps (bad), and the duration of the data sector 1 and 216 seconds, the value calculation 38,92 Kbps and measurement 38,83 Kbps (enough).

2. For the calculation and measurement of the 3 g sector in all categories, except for sector 1 duration data 47 seconds, the value calculation 178,87 Kbps and measurement 176,58 Kbps (enough).

3. The speed of 256 kbps 2G maximum data and data 3G 1200 kbps, so the speed of 3G data access much faster/better data access speed compared to 2G.

4. The faster duration access data and access speed data also the faster good.

3 CONCLUSION

1. The measurement standard of entry PT Telkomsel, value quality voice < -85 dBm and the speed of data access 22 Kbps - 465Kbps

2. That the farther the distance measurement location (0, 95 km =-86dBm) antenna 2G and 3G antenna signal quality in voice level is getting worse.

3. The faster duration access data and speed access data bank too the faster / good, vice versa the longer duration access data and access speed data will slower / bad.

4. Access speed data 3g between 144kbps - 2mbps much more quickly and well compared with access speed data 2g between 10kbps - 256kbps, so the addition of 3g antenna very influential against access speed data. Speed of data access is much faster/better.

3.1 Suggestion

To further research measurement result can be used to know parameters - parameters other, example measurements of signal quality level video and speed delivery of SMS (Short Message Service).

References

Dwi, G., Gunawan, W., Uke, K.U., Hantoro., (2007), *Konsep Teknologi Selular*. Bandung : Informatika.

Jhon, C., Dennis, R., (1995), *Komunikasi Elektronik*. Jakarta : PT. Prenhalindo.

Kiswanto, (2010), *Analisa Kerja Jaringan Operator 3G (WCDMA UMTS) Menggunakan Metode Drive Test*. Politeknik Negeri Surabaya.

Murpyhadi, H., (2011), *Analisis Untuk Kerja Jaringan 3G di Area Cluster GSI 2*. Universitas Indonesia, Depok.

Nugroho, F.Y., (2013), *Analisis Kualitas Layanan Panggilan Pada Telekomunikasi Bergerak 3G*, Universitas Dipenegoro, Semarang.

Praharasty, A., (2009), *Analisis Kualitas Panggilan Pada Jaringan GSM Menggunakan Tems Investigation*. Universitas Diponegoro, Semarang.

Rizkia, S., (2012), *Model Propagasi Jaringan Komunikasi Selular*.

Riyanto, (2010), *Sistem Informasi Geografis Berbasis Mobile*. Yogyakarta : Gava Media.

Shoji, S., Suhana, (2004), *Buku Pegangan Teknik Telekomunikasi*. Jakarta : PT. Pradnya Paramita.

Sunomo, (2004), *Pengantar Sistem Komunikasi Nirkabel*. Jakarta : Grasindo.

Syafari, A., (2007), *Sekilas Tentang Teknologi 3G*, IlmuKomputer.com.

Syaikhuddin, A., et. all., (2012), *Analisa Unjuk Kerja Layanan 3G di Surabaya*, Institut Teknologi Surabaya.

Yuli, K.I.S., Hendri. S., (2008), *Analisa Perhitungan Link Budget*. Jakarta : Universitas Trisakti.