CHAPTER 5

RESULTS ANALYSIS

Based on the interview, data and information regarding the comparison of Wifi and Wimax technology are obtained. In this chapter, an analysis is conducted based on the interview with the respondents. There are two interviews conducted on this research. The first interview was conducted with Mr. Riyadi Hartono, the Planning and engineering Manager of Indosat M2 (IM2). The second one was conducted with Mr. Gatot S. Dewa Broto as the Head of Human Relations of Depkominfo.

5.1 Wifi and Wimax overview

Wifi and Wimax are two technologies that are evolving. Network providers are interested in implementing Wimax in Indonesia. Indosat M2 is one of the providers that will make a retail version of Wimax. As said by Gatot “We conducted an auction on the technology. How much they dare to pay in each zone in Indonesia. There are 6 winners; some of them are Telkom, IM2, First media, Berca, Interlux, and Jasmita. They are on behalf of operators”. Riyadi quoted “We will provide Wimax 802.16e for retail purposes”. Retail version will be applied to Wimax technology.

Depkominfo brings Wimax to Indonesia in hoping that it can socialize data communication in remote areas which are not urban cities, or capital cities. Gatot said “The first reason is Wimax is meant to back up data communication, not voice, but only data communications especially to remote areas. The tender is not only for big cities. It is from Jakarta to Aceh, Ujung Berung, etc. currently data communication penetration is low. So Wimax can be an advantage. So we made an

auction in hoping that providers can socialize internet in unreachable areas. You can see on our web, the bid for urban areas like Jakarta there are many bids around 100 billion rupiahs. But in Papua for example, providers bid only 600 million. So if asked why Wimax? It is to help data communication penetration."

From this statement, it can be obtained that the government wishes to socialize data communications technology generally in Indonesia. The fact that internet use is growing by numbers, people in small cities or remote cities will have an option to use internet not only using 3G or GPRS network. With Wimax, Internet penetration can be feasible and reach remote areas. Wimax also can be a backhaul to operators and they can make a better infrastructure that reaches remote areas.

5.2 Results Based on Comparison Metrics

From previous chapters, the author discussed about comparison metrics of Wifi and Wimax. From the interview, questions based on those metrics are also given to the respondents. This relates to the feasibility studies of Wimax.

Based on the regulations, Wimax and Wifi are compared in terms of radio frequency. Riyadi said "Wifi uses unlicensed frequency. Wimax uses licensed frequency". Licensed frequency means the regulators, in this case Depkominfo, classified frequencies to a vendor or network operators to be used on Wimax technology. Therefore one vendor is given a frequency and it cannot be interfered with other devices that use the same frequency. Wifi, in the other hand uses unlicensed frequency, which means there is no frequency given only to a particular vendor. The author discussed with Riyadi on this matter. "You know the consequence of unlicensed frequency? It will be crowded." Riyadi said. Interference and the chance of being crowded are drawbacks for Wifi technology. IM2 uses Wifi only for indoor

use. They set up Wifi hotspots indoor. In malls, cafes, and other indoor public places. Indoor Wifi can be used as PMP (Point to Multipoint). Therefore the access point propagates signals to many devices. Wifi can also be used outdoor, however only using PTP (Point to Point) network. It is used to connect two access points. For example between an area to another separated by a distance. To use Wifi as a PMP network outdoor would result in frequency interference. This happens as a result of the unlicensed frequency. Riyadi discusses “That’s right. Why we do not make an outdoor PMP Wifi? It is because there will be chaos in terms of frequency interference. If it was used indoor in a building, the frequency can be managed”.

5.2.1 Scalability

Riyadi also talked about the scalability of both technologies. “With current condition, it is still complementary. Let me explain, Wifi 1 sector can be used by 50 users, with Wimax, can be up to 256 users scalability can be reviewed from many point of views. For example concurrent user, bandwidth throughput, spectral efficiency, etc. For concurrent user Wimax is better. Throughput, Wimax wins, and Wifi wins other aspects. Actually it is so so. But with the current regulation, wimax is better. Because we can guarantee.” It is said that Wifi and Wimax both has advantages and disadvantages in several aspects. Therefore it is relative to some factors and they are complimentary. However, the interference issue becomes a significant drawback to Wifi. As channel bandwidth cannot be selected by operators, beneficial features such as sectorization cannot be feasible. In the contrary, Wimax has the advantage of licensed frequency. Therefore has better scalability.

5.2.2 Performance

The author discussed about the performance of Wimax and Wifi. Riyadi said “Wifi actually is good in terms of performance. However the drawback is the interference factor.” Gatot also has a view on this matter. He said “Like I said earlier, with wimax deployed. There will be choices. But with Wimax, not only it will provide greater speed, but also there will be many variants, and the quality of service. Wimax and Wifi performance depends on the bandwidth from the provider. If given a bandwidth that can be fully utilized in the maximum throughput of Wifi, it actually performs as expected by operators. Based on theories and previous researches, Wimax provides greater speed. In the comparative analysis in previous chapters, the author state that the throughput is almost twice of Wifi. Maximum throughput of Wifi is 54 Mbps. Wimax can achieve 100 Mbps.

5.2.3 Security

Security is also a topic to be discussed. When asked on security, Riyadi said “Wimax uses 3DES, actually they are the same. There is no issue regarding security.”. “There won’t be any (problems), if the data are already scrambled. The scrambling is on physical layer. After we go into the system, there are also firewall, and etc. So there are layers of security.” Gatot said “Yes, for security. There won’t be any problem, because it is focused in the protocol. And operators did not have any problems with it.” From the statements, it is indicated that security has not been a problem with the technologies. They rely on the security mechanisms on the protocol on the physical layer. Authentications, Encryption, and authorization play an important role in

security. The protocol already has those features built in the physical layer. Therefore there will not be a significant problem.

5.2.4 QoS

The quality of Service aspect is also discussed. When asked about the quality of service of Wimax. Riyadi replied “Because of the frequency we managed our own, supposedly Wimax is better. Not because of the technology, but because of the environment. Wimax has the advantage. There are 5 options. There is best effort, the others I forgot, you can look up on it. Wifi does not have any QoS. Actually Wifi, if we use our won frequency, we managed it our self, it is feasible in the sense of business. However, because of the chaos, it is unfeasible right now. Actually Wifi is a good technology, for example if the frequency is licensed; it would become a good business opportunity. Cost is cheap”. Wimax have quality of Service. As stated in the previous chapter. The QoS section has discussed the difference between Wifi and Wimax in terms of QoS. IM2 proves the theories about QoS of Wimax. Wifi does not have any particular QoS.

5.2.5 Mobility

The author asked about the mobility aspect of Wimax and Wifi. Riyadi explains “About mobility, Wifi is fixed technology. Wimax d is also fixed. Wimax e is nomadic. Globally, most users choose nomadic access. We seldom use the internet for example in a moving car. Well I can’t because of the dizziness“. Riyadi only explained about the technology in general point of view. He did not explain in the point of view of speed. The fact that more users are interested in nomadic access confirms that user is convenient enough to use internet wherever they go.

5.2.6 Coverage

Unfortunately, coverage was not discussed deeply. However the author obtained some information regarding this topic. When asked about the coverage of Wimax and Wifi, Riyadi replied “It depends. Like I said earlier, There is rural, urban, and dense urban. Actually for Wimax, because in Indonesia it a frequency that is similar as Wifi, The coverage is the same.” He discussed about the types of coverage a wireless network. There are rural, urban, and dense urban. IM2 will provide Wimax service on all areas. From this fact, it can be assured that Wimax service has a better coverage than Wifi. Gatot also said that Wimax will be able to provide broadband internet access to remote areas, also to promote better data communication penetration. Surely, this matter brings a conclusion that Wimax has better coverage than Wifi.

5.2.7 Cost

Cost aspect of the comparison was discussed in the manner of feasibility studies. Riyadi first explained about the types of Wimax. “There are two types of Wimax. There are two Wimax standards, 802.16d and 802.16e. The d version is for indoor use, and the e version is for outdoor use. The e also supports mobility. 802.16d uses an outdoor unit CPE. For 802.16e, the CPE is in a form of a dongle / usb modem. Therefore user can use them outdoor.” Then, he explains about the usage Wimax in terms of range. “In the case of Wimax, it can be used for outdoor. We can also use it indoor using point to multi point. Usually it can be used for residential. However, if the range is further than residential, for example if we enter a huge building, there should be installed an indoor BTS like GSM. It not recommended business-wise.

Therefore for indoor penetration, we combine with Wifi". Wimax can be used outdoor; however it could not penetrate huge buildings or huge malls. Indoor BTS must be used. This is not recommended, because if the cost. It is better to use Wifi to provided internet for indoor. Therefore Riyadi recommends combining with Wifi. Another statement from Riyadi "Now, if we talk about 802.16d. It is a different case. D is for outdoor use. CPE for 802.16d costs more than e's CPE. We should talk about 802.16d and 802.16e if we want to talk about Wimax technology. For 802.16e the CPE is about $80. 802.16d costs more, about $400". This proves the comparative analysis of the theory in chapter 4, in the cost section. Riyadi adds "Yes. D is fixed Wimax. There is also installation to be taken care of for the outdoor CPE. And there must be professional installer" From these statement the author learned that not only the CPE is expensive, but also there must be another cost of installation added. That is why IM2 do not plan to implement fixed Wimax. As stated by Riyadi "Yes. That's why we prefer to implement 802.16e for retail purposes. The 802.16d is more suitable for SOHO (small office home office), or SME (Small Medium Enterprise)."

5.3 Feasibility Study

From the interview, the author found an interesting study on Wifi and Wimax. There are no technology is better than the other. It is complimentary, not a substitution. To determine which technology is better is relative several factors such as Environment, regulations, and many more. As said by Riyadi "Wimax and Wifi cannot be compared. Those two are different and there is no better technology between those two. They are complimentary. Not as a substitution." When asked regarding the advantages of Wimax to be implemented in Indonesia, Gatot replied "okay, talking about advantages. Actually this is a universal technology. The advantage if we develop this technology. The people will have many choices. For example if you go

to central Kalimantan, Palangkaraya maybe, what you can do is you connect with your laptop using one provider's 3G service. That is expensive, if there is Wimax, there will be an option. "I don't want to use 3G of A, I will use wimax service of another operator" or with the same operator, but the price is more competitive. Therefore Wimax will provide choices." Wimax provides option for user to use data communication facilities. Riyadi also explained "It depends on the need. For example in a laptop there are Wifi, Wimax, and 3G technology. It is up to the user to use which technology. We just provide another option to user. For example the 3G has reached the maximum quota; the user can switch to Wimax. It is complimentary. In houses, there might be no Wifi, but in malls we have three choices; Wifi, 3G, or Wimax." Diversity of wireless networking technology provides better choices for user to access the internet.

The author also conducts comparison between IM2 Wifi hotspots and Wimax service, related to the business side. IM2 provides several Wifi hotspots in public areas and include a charge for using them. One surprising statement from Riyadi "Our Wifi hotspots are not meant to generate income. It is not a profit center. It is for marketing purposes." IM2 basically does not intend to generate money from Wifi hotspots. The purpose is for marketing and promotion. The main income for them is the broadband cable service. The number of user using Wifi hotspots is low. Riyadi explained further "Yes. That's why we cannot compare the cost, tariff, and profit for Wimax and Wifi hotspot. Wifi hotspots are provided tariff but there is no money to it. It caused by environment and we cannot guarantee the quality related to government regulation which causes the unlicensed frequency. Everyone can set up their own Wifi hotspots. And there are a lot of public places like cafes already providing Wifi and it is free of charge." Business opportunities on Wimax

technology are very promising. Supported by the fact that Wimax will be relatively cheaper than other current BWA technology such as 3G, Evdo, CDMA, Wimax is a good business opportunity especially for network operators. Gatot explained “Of course, the cost is cheaper. Back when the bid for 3G is very expensive. It could reach 320 billion, the lowest was 120 billion. This shows difference. The highest bid for Wimax is only 120 billion. That is for Jakarta minus Bekasi, Bogor and satellite areas around Jakarta.”

The author discussed the drive force behind the usage of Wimax, and Gatot said “Yes, the reason is one, they will see that people will be interested remembering that the tariff will be competitive. Second, the trend of using data communication is currently very high. Even in villages they would use it for commodity purposes, but not all farmers. It is for commodity transactions. Therefore data communication is important. The third one, maybe there are some kind of obsessions from the operator. If this technology is implemented, it will benefit operator. For example, there is this one company, I don’t want to say names, and the base revenue for voice communication based on telephone line does not become a profit center for them. They rely on data communication. Okay let’s say Telkom. They must compete for data communication technology.”