

Indonesian Telecoms – The Development Trajectory

**by
David Allen¹**

Abstract

Prices for telecoms services could decline substantially if Indonesia were to accelerate the pace of telecoms development to that of some of its neighbors.² Besides benefits to the sector, Indonesian society could begin to enjoy the fundamental benefits which telecommunications confer. The KSO model is an industry structure which might be ideal for the uptake of telecoms technology at a faster pace. At issue is whether this structure will be utilized with the dynamic mix of competition and consensus on standards that is necessary. Several technology choices are available and will be critical for the consensus process. For future discussion in the WTO, an international universal service fund might be established to replace funds generated by the international accounting rate system.

This paper weaves together several factors - price, pace, technology choice, and industry organization - for Indonesia's communications sector. Taken together, these factors elevate (or lower) the trajectory of development of the sector. Indonesia has launched some exciting initiatives in its communications sector - some of which might even serve as models for others. Such a commitment reflects the importance of moving the sector from its current state of underdevelopment. The analysis here highlights pivotal policy questions for those concerned with the takeoff of Indonesian telecoms, leaving to other efforts the detailed investigation which is essential.

¹ This paper was prepared for the USAID-funded Trade Implementation Project in Jakarta while the author was retained as a consultant for three weeks by Nathan Associates (Arlington, VA).

² With the convergence of telecoms, computing, and broadcasting, "communications sector" is used here to refer to all sub-sectors together (rather than, for instance, the more awkward "communications and information"). As a useful shorthand, "telecoms" will also be used interchangeably with "communications sector," but the reader is cautioned not to confuse traditional telecoms with the much broader sector that is emerging.

The Issue of Price

Indonesian telecoms prices have declined in recent years, but still appear relatively high. Let's consider the advantages of lowering the overall price level. The price elasticities of demand for telecoms services are such that reducing unit price may actually spur unit volume to the extent that total revenues to the carrier increase. This can be particularly pronounced for long distance calls. The demand elasticity effect has already been well demonstrated in the Indonesian market for cellular handsets, where dramatic drops in handset prices have led to a boom in sales. The demand elasticity effect was also the motivation behind some of the basic changes in the U.S. telecoms policy over the past 15 years.³

Much more important than the effect on carrier revenues, telecoms price adjustment would bring Indonesian society the advantages which accrue to fuller utilization of its investment in telecoms infrastructure.⁴ Future commercial and industrial development - the heart of Indonesia's success - depend on the possibility for such network usage. Equally important, the life of Indonesians at home can be enriched. To improve living standards at work and at home is the reason why telecoms investments are desired in the first place.

But to lower price by a substantial amount might encounter serious difficulties in implementation, particularly if it encourages usage that exceeds current and planned capacities. To enjoy increased revenues from the elasticity effect - instead of a loss of revenues from lower prices - both PT Telkom and the KSOs might have to expand

³ In fact, it appears that the Ministry of Tourism, Post and Telecommunications is committed to consider the level of the rupiah against an appreciating dollar in future price rulings. This suggests a rise in prices rather than a decrease.

That Indonesian telecom prices are high is based on evidence from one company interviewed. Accordingly, a long-distance call from one of Indonesia's seven telecoms regions averages about US\$.40 per minute, compared with a long-distance rate of approximately US\$.10 per minute in the United States. Thus, Indonesia's long-distance prices appear to be four-times greater than those in the United States. The question of Indonesia's price levels relative to those elsewhere in the region requires more careful analysis. [See the Appendix for a further discussion of pricing methods and the postalization of long-distance rates].

⁴ At current price levels, it is not clear that Indonesia's network is fully utilized. Less than two years ago, half the long distance capacity on Indonesia's main long-distance route (Jakarta-Surabaya) was idle, according to Minister Joop Ave who commented at the time. There could be any number of any reasons for idle capacity. For instance, excess trunk capacity might have been installed in anticipation of an increase in local cabling (and the figures cited are two years old). However, prices that are too high can also be a fundamental cause of idle capacity, which then serves as a symptom of the problem with pricing.

capacity beyond current plans. The KSOs may have predicated their business plans, including their existing expansion schedules, on something like current price levels. PT Telkom, which is a substantial employer of the state, might also object strenuously if its financial viability appears to be undercut. PT Telkom's own expansion plans and payroll may depend on revenue streams which are also based on current prices. Thus, re-negotiating higher goals with the KSOs and PT Telkom might be no small matter and additional incentives might be necessary for a transition period.

The Benefits of Faster Pace

To lower price levels substantially, while maintaining the financial viability of the KSOs and PT Telkom, clearly calls for raising the pace of telecoms infrastructure development. With more infrastructure in place more quickly, carriers would have the capacity necessary to meet the increased demand from subscribers. The KSOs and PT Telkom might then be able to see increased revenues from the elasticity effect.

PT Telkom could enjoy another crucial effect as well. In deregulated environments, public telephone companies typically face severe pressure to downsize. That has been the case in all the countries where liberalization has occurred. In the United States, a quarter of a million jobs were eliminated after divestiture, and AT&T has recently announced an additional 40,000 layoff. Similar scenarios characterize Germany and France today, where reductions of up to 40 percent of the work-force have been floated; NTT in Japan has also shed tens of thousands of jobs since its privatization in 1984. Though new jobs may be created in competing carriers, the transition is nonetheless stressful, and sometimes disastrous for individuals.

While PT Telkom might not face such prospects in the short term, Indonesia benefits powerfully when its main provider in the sector learns greater efficiency.⁵ With a faster pace to development, PT Telkom might be able to maintain much of its employment, future liberalization notwithstanding, and dramatically increase efficiency at the same time. If PT Telkom increases the number of lines by a factor of about four, but maintains rather than increases employment, the number of employees per thousand lines declines from 30 to 8. PT Telkom already aims to increase its lines by a factor of something like two.

These benefits notwithstanding, the Government might not be comfortable with a faster pace. However, Indonesia is dramatically behind its neighbors in telecom services,

⁵ Indosat might come under greater pressure from liberalization of the international settlements regime.

certainly on a lines-to-GDP basis. This is a serious problem for development since the evidence is that telecoms infrastructure is one of the most vital underpinnings in today's world economy. Certainly, telecoms looms central as activities become more information intensive and when a society, such as Indonesia's, would like to increase its role in the world economy. That is compelling reason to leave behind past concerns about a faster pace.⁶ A much faster pace is also possible. China and India, with lower GDP per capita than Indonesia, have in a single year installed the same or significantly more (two and a half times more) lines than Indonesia's official Repelita five-year target.

Personally, I view pace as the fundamental decision, from which other conclusions then grow. Pace depends on individual and social capacity to change. The balance between keeping pace with others, versus honoring some internal clock, is fundamental in my view. Related to pace is the distribution of telecoms facilities within Indonesia. The economics of investment will lead to developing the densest, and wealthiest, areas first. But lopsided development - socially and economically - has the effect of embedding social differences into a technology which might otherwise be a force for integration, since it is the electronic "nerve system" of society.⁷

If a much faster pace is needed, how can it be achieved? Organizational arrangements are most important in my view, though usually the hardest to change quickly. In this regard, Indonesia has created an exciting template with the KSOs (see below). Shrewd technology choice may also show results quickly and may speed up development. As noted below, for instance, fixed wireless is a technological choice which could extend the network into Indonesia's less-privileged areas.

The Role of Standards

Pace of change, particularly in an intimately interconnected technology such as telecoms, depends on the ability to orchestrate change - but with some reverse twists across the numerous actors involved. Indonesia's experience with cellular illustrates nicely.

⁶ I understand that the five million line goal was recently raised to eight million lines, when cellular is included. It appears, therefore, that a faster pace is being considered.

⁷ Reinforcing those social differences - particularly via long-lasting physical infrastructure - is hazardous when those differences already threaten to (and do in fact) boil over. Some may feel that access to networks only enfranchises dissent; but I believe history tells us that, in today's world, failure to provide infrastructure is more likely to trigger unwanted politics. That said, there are limits to extension of the network rurally, particularly when electrification still reaches only 28 percent of Indonesian households, if I understand that number correctly. But the goal is as important as the steps along the way.

By bringing competition to its cellular market, Indonesia has in effect conducted a large-scale experiment with cellular technology. AMPS, NMT, and GSM are all represented in the Indonesian market; and Indonesia has the opportunity to try each out and test it against the others. And, it is about to extend that experiment to PCN/PCS. However, the time comes when there needs to be agreement on a standard. The economics of investment are compelling, here.

With three prospective standards, the investment necessary to provide universal coverage is three times that for a single standard. Of course, callers on the different networks can interconnect with each other through land-line switches. But for any given geography - be that Jakarta or the whole of Indonesia - the individual cellular subscriber depends upon universal coverage with towers which use his/her protocol. With three protocols, the investment is three times what is necessary. Though competition will always bring some duplication, this is triplication. And the addition of one or more PCN/PCS protocols will continue to multiply the investment ultimately required - to four, five and six times, etc.

With investment funds one of Indonesia's more precious resources, the importance of deciding on a widely used standard becomes clear. In fact, the same scenario transpires with each new communications technology.

Even so, investment funds are not, in the end, the compelling reason to agree upon a standard. Rather, the benefits from full interconnection across the network are the real payoff. Interconnection is after all the function of a network.

A Cycle of Competition and Consensus

The cycle begins when a new idea will not interconnect with the prevailing standard; but the new idea, and other competing new ideas, need to be tried out. Then, competition is crucial to allow experimentation. This is the situation that Indonesia has created in cellular.

The next phase of the cycle occurs when agreement on a new standard becomes essential. For instance, the United States has still not been able to agree upon a digital television standard. The price is not so much in the investment funds which will be devoted to non-interconnecting video sets (though that is not insignificant). Rather, it is the inability to gain the wider advantages which might be enjoyed from full interconnection, in this case a coherent digital television system. Until this is achieved, the United States will lack seamless interconnection between computing, especially the Internet, and traditional television; it will not, for instance, be so able to bring micro-casting together with

broadcasting. Since interconnection is the function of a network, a standard - and so consensus - are an essential part of the cycle.

Then the cycle begins again, with the next new idea.

But one might say, “consensus on a standard sounds like the opposite of competition. Isn’t competition where we are supposed to be going?” This view would be on target. Both competition and its reverse counterpart, consensus, are essential. That is why orchestrating the process of change involves some reverse twists. There needs to be a mix over time between the competition, which Indonesian telecoms has been experiencing in cellular, and the consensus.

Industry Organization to Support the Cycle

The KSO organizational arrangement is the type of industry structure that such a dynamic scenario requires. For competition, the industry needs to separate into individual units and experiment; for consensus, those units need to be able to come together and reach agreement. The KSOs have it both ways; separation and participation are both present. Each KSO, with its world-class telecom participant(s), is its own operation; yet each is also a part of PT Telkom.

Indonesia must now utilize this industry structure in a dynamic fashion, alternating between part and whole, first competition, then consensus. To illustrate, consider the current “industry architecture” when some new technology is in an early phase of the cycle. The KSOs and PT Telkom may compete with each other to produce the most successful “experiment” - we have seen the example of experiments with different versions of digital cellular. Then later, in the mature phase of the cycle, focus switches to consensus among the industry players to reassemble network coherence.

The choice among cellular technologies is only one among very many evolutions in technical choice which the network must navigate. The process is equally applicable to other technologies and to new choices for development targets, such as substantial increases in number of lines to be installed. If Indonesia can combine newly learned competition in cellular with existing traditions for consensus, and then set them in the appropriate dynamic scenario, its sector will have powerful prospects.⁸ Whereas the great strength of the United States is competition; Indonesia’s is consensus.⁹ The ideal is a dynamic combination of the two.

⁸ Though not really addressed here, the user must also be part of the process.

⁹ Cases from the United States present models on both sides. The Internet and World Wide Web

It is continuing technical change which offers to improve living standards. But societies must move deftly from experiment to standard, and back again repeatedly, if we want to gain the benefits. Such industry-organizational dynamics are essential to quicken the pace for Indonesian telecoms. In this regard, the staged process currently used by the KSOs is an attractive model.

Choice of Technologies

One technology which would allow Indonesia to quicken the pace significantly is fixed wireless. The geography of Indonesia has led it to develop particular expertise in radio and its several forms. Some of the key human resources for wireless are already in place. Has consensus formed around fixed wireless to accelerate the pace? Some KSOs are apparently using fixed wireless. But, getting the quick installation of many lines through fixed wireless would require wide, concerted adoption of the strategy.

Fixed wireless also needs to be carefully balanced with a program for longer-term installation of fiber. The Net and Web will apparently be one cornerstone of future telecoms, and the Web has already pushed beyond the limits of bandwidth that are available without wide-band media such as fiber. In the United States, some workers stay at the office in the evening simply because they have a high bandwidth connection to the Web via a LAN, but cannot get that connection at home. As another benchmark, Singapore has apparently targeted a completely fiber net by 2002.

Fixed wireless can be installed quickly, while cable-based technology such as fiber takes much longer and will require a huge investment.¹⁰ In the United States, we have a

are sub-sectors in the United States which have moved at breathtaking speed. There is barely anything like it in the annals of innovation. Sector participants regularly remark that they themselves hardly believe the pace of change. It is the best of what the United States to offer.

But consensus is not always a strong suit of the United States. A recent *International Herald Tribune* article describes the slow pace in the United States as it tries to introduce local competition after the landmark telecommunications law last year. While there are a few sound reasons why implementation of the law has gone slowly, the lack of consensus is one of the most important reasons. The history of the breakup of AT&T shows that consumers may indeed wait a decade and more for results. As one of many examples, almost ten years elapsed after AT&T's invention of AMPS cellular telephony before the FCC decided on the duopoly regime which finally allowed it to be used. See for background: David Allen "Le débat d'idées avant et après le démantèlement d'AT&T: Une chronique," ("Breakup of the American Telephone Company: The Intellectual Conflict, Before and Since,") Réseaux, as translated by Centre National d'Études des Télécommunications, Paris, Nov-Déc 1992.

¹⁰ The Jakarta press recently cited investment figures of 95 trillion rupiah, or US\$40 billion [early '96 exchange rates]. Almost certainly, this amount will turn out to be only a down payment. A

universal copper network at the local level, as well as a great deal of coax. Indonesia has no such albatross around its neck - no existing, but outdated, technology which requires economic compromises. When Indonesia makes the very large investment necessary to cable the country, surely it will want to take advantage and leapfrog to a wide-band net, right to the home.¹¹ That is one of the advantages of being a developing country which has waited till the edge of the 21st century for its move into telecommunications.

Similarly, choices about ISDN or CDMA can be taken with an eye to putting Indonesia at the technological forefront. There is an irony here, however. So long as the pace is slow, choosing the technology for the future is straightforward. The choice is wide-band rather than ISDN, CDMA over earlier forms of digital cellular. By the time this chosen technology is installed at the slower pace, any other choice would be outdated. Once the pace quickens, however, the competition/consensus cycle begins to stride in time with those who are driving innovation - picking the winner becomes less certain.

International Universal Service

This section addresses only one facet of finance, the funds which have been generated from the international settlements system. As is well known, the pressure will grow to reduce international accounting rates toward costs. As a result, Indonesia and others will begin to lose the funds that have been generated from the international settlement system. These flows have been important to the telecoms development of many countries.

A comparable situation has already occurred at the national level in the United States. Previously, local telephony had been funded through implicit subsidies from long-distance rates which were set above costs. With last year's telecom legislation in the United States, those implicit subsidies are to be eliminated. However, the new legislation also recognizes that universal service depends on such funds. Since cross-subsidization is now eliminated, a universal service fund has been mandated, with contributions from carriers across the United States and paid to regions that require them.

large amount of investment must also come from consumers. For instance, Indonesia's current market for Internet access is embryonic, with an estimated 25 thousand users. At almost 5 million rupiah (US\$2,000) for a computer, the average Indonesian faces a daunting obstacle. At 1.2 million rupiah (US\$500), the new Network Computer/NC from Sun Computing, or as it is known the "thin client," would cut that investment considerably. If one assumes that the number of consumers on the Internet grows to one million, the necessary consumer investment drops by a factor of four, or from 4.8 trillion rupiah (US\$2 billion) to 1.2 trillion rupiah (US\$500 million).

¹¹ As the fiber comes on-stream, the fixed wireless installations might be convertible to mobile with some further investment. The initial investment in fixed wireless could then be re-used.

Similarly, as Indonesia and others lose flows from the international long-distance system, an international universal service fund might be set up. This might be a topic for future discussion in the WTO, now that the telecoms agreement has been finalized. The fund would be an explicit mechanism for transferring funds to regions of the world which require them for universal service, and would replace the outmoded accounting rate system for international settlements.

Appendix -- Mechanisms for Setting Prices

Indonesia has now changed to the price cap mechanism for setting prices. This mechanism can lead to lower prices when productivity increases exceed inflation. But in practice, productivity estimates may be negotiated politically between the Ministry and PT Telkom, among other interested parties. Thus, the role of a price cap actually becomes moot. Beyond that, telecoms pricing in the United States (and the United Kingdom among several others) has now moved beyond price cap to concerns with interconnection. This is to be expected when there are several actors in the sector, as with cellular presently in Indonesia. In addition, countries are reverting back to cost-based rules and to all the cost data analysis this implies.

Rules for interconnection pricing are now being debated, and there is a sharp intellectual divide over whether to include in the price an element for contribution foregone (the Efficient Component Pricing Rule/ECPR).¹² Including an element for contribution foregone would raise interconnection prices to a level which would-be entrants decry as prohibitive. In the United States, the intellectual fight is mirrored by a political struggle between local incumbents, such as the RBOC's who defend higher interconnection prices; and entrants, particularly AT&T, who are against. A portion of the new U.S. telecommunications law has been stymied in court as a result. In this emerging regime, price caps may be relegated to determining price ceilings.

Also, long distance rates are postalizing in many countries. That is, there is now a single distance-insensitive price for mail and long distance telephone calls. In the United States, for example, AT&T offers US\$.10 per minute. With almost 6,000 kilometers from coast to coast on the continental United States, the distances under a single rate are less than in Indonesia, but they are of the same order of magnitude. Indonesia, with its new 6 second pulse for all long distance calls, has also postalized. It seems likely that today's postalizing for long distance will one day include local telecoms as well. Countries with less terrain to cover, such as Korea, have already considered the possibility.

¹² See the current issue of *Information Economics and Policy*, Vol 9.2, June 1997, Elsevier, Amsterdam. The issue is devoted to interconnection and pricing.

In the United States, the trend toward full postalizing may be hastened by the fact that carriers now aim to provide “one-stop shopping” for their subscribers. Services such as local, long distance, mobile, Internet, video and a great deal else would all be provided under a single brand name. In other words, U.S. carriers aim to re-integrate, particularly across local and long distance, that which was broken asunder in the U.S. divestiture 15 years ago (we would say, to “put Humpty-Dumpty back to together again”).