Plotting public participation on Indonesia’s Internet

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Abstract: Focusing on public access rather than business or commercial applications, this article seeks to answer some fundamental questions about Internet use in Indonesia: How many people use the Net? Where and how do they gain access? Who facilitates this: government or private industry? What strategies are expanding public access? In answering such questions, the article examines Internet use as a social practice in Indonesia. It begins by plotting Internet growth. It then focuses on public access Internet facilities, discussing geographical diffusion, ownership trends and the potential for increasing user numbers. Finally, it teases out some user profiles and patterns of usage.

Keywords: information technology; statistics; public; café; cyberspace; warnet

Much has been written about the uneven global diffusion of the Internet, so commonplace in America and parts of Europe, while barely imagined in Africa and parts of the Middle East and Asia.¹ Little surprise then that within a developing economy such as Indonesia, access to the

¹ For example, Kalathil, S., and Boas, T. C. (2003), Open Networks Closed Regimes: The Impact of the Internet on Authoritarian Rule, Carnegie Endowment for International Peace, Washington, DC; and Franda, M. (2002), Launching into Cyberspace: Internet Development and Politics in Five World Regions, Lynne Rienner Publishers, Boulder/London, particularly pp 11–18. The inequity in worldwide Internet access is indicated by 1997 figures on Internet users per 10,000 people, with Finland (653.61), Norway (474.63), USA (442.11), New Zealand (424.34) and Australia (382.44) ranked very highly, in contrast to Angola, Benin, Tanzania and Tunisia, with 0.02; Algeria, Burundi, Libya, Rwanda, Togo, Uganda and Cambodia, with 0.01; and Bangladesh, Chad, Democratic Republic of Congo, Eritrea, Ethiopia, Gabon, Gambia, Guinea, Haiti, Iran, Iraq, North Korea, Laos, Malawi, Mauritania, Myanmar, Nigeria, Oman, Sierra Leone, Sudan, Tajikistan, Turkmenistan and Yemen, where the number of users was too low even to register – 0.00 (Moschovitis, C. J. P., Poole, H., Schuyler, T. and Senf, T. M. (1999), History of the Internet: A Chronology, 1843 to the Present, ABC-CLIO, Santa Barbara, pp 274–275, cite World Development Indicators, 1998). By 2002, virtually all of these countries listed had some level of Internet usage (see ‘Information Technology’ statistics on www.itu.int/ITU-D/ict/statistics/at_glance/Internet02.pdf, visited 6 August 2003).
Internet reflects a similar inequality. In the context of an increasing expectation within both governments and the private sector that new ‘information technologies’ (IT) such as the Internet will bring broad social and economic benefits to countries adopting them, the consequences of inequitable access in Indonesia are significant. In particular, any assumptions by technophiles and bureaucrats in Jakarta that the Internet offers Indonesia unparalleled economic, political and social gains need to be tempered by a realistic assessment of the limits and costs of the technology. For the majority of Indonesians on the fringes of the IT revolution, access may be more a matter, not of ‘Internet’, but rather ‘Enter not’!

Focusing on public access rather than business or commercial applications, this article seeks to answer some fundamental questions about Internet use in Indonesia. How many people use the Net? Where and how do they gain access? What do they choose to view and what is their pattern of usage? Who facilitates this public usage – government or private industry? What strategies, if any, are being pursued to increase public access? In attempting to answer such questions, we seek to plot public Internet usage in Indonesia. The article therefore attempts a tentative analysis of Internet use as a social practice in Indonesia, recognizing that public Internet use in Indonesia differs from that of Western developed nations (which have been the focus of most research to date). In Indonesia, raw statistics on connectivity do not give an accurate picture of who uses the Internet, or even how many users there are, much less how they use the Internet. In a community where one copy of a newspaper is estimated to be read by at least six people, there is extensive communal use of this much more expensive medium of information. Where and how one accesses the technology may substantially determine the use to which the technology is put, for the Internet is not just a ‘new technology’; it is a ‘wholly new, constructed environment with its own codes of practice’, codes of practice and usage that vary greatly according to the social, cultural and political contexts within which the technology is applied. Thus, the communal locations from which most Indonesians access the technology may, to some extent, shape the social, cultural, political and economic consequences of the technology here.

2 Defining an ‘Indonesian Internet’ is problematic, since the Internet’s ‘virtual’ nature means it is not bounded by physical location, language or nationality. However, for the purposes of this paper, we are focusing upon use of the Internet by actors within the Republic of Indonesia.

Like the Internet itself, research about the Internet in Indonesia is in its infancy.\(^4\) Many elementary questions have yet to be answered in detail and the rapid pace of developments overtakes easy answers. Much of the literature concerns either highly technical aspects of digital communications hardware and engineering infrastructure, or takes the form of thinly veiled marketing, promotional or business management material touting vast profits to be made from investment in dot.com businesses of various kinds. This paper attempts to plot public participation on the Internet in Indonesia by examining three broad aspects. First, it begins by detailing the growth of Internet use in Indonesia. The second section focuses on public access Internet facilities as the country’s major locus of Internet use, discussing their uneven geographical diffusion, their ownership trends and the potential for increasing user numbers. Finally, having established the diffusion patterns and the dominant mode of connection to the Internet, we tease out user profiles and patterns of usage. The paper thereby seeks to provide a basis for more theoretical research about the Internet in Indonesia.

**Measuring Internet growth**

Global use of the Internet has increased one-hundred-fold since 1991. In 2002, the International Telecommunication Union estimated that there were around 590 million Internet users globally, with more than one-third in Asia, including about four million in Indonesia.\(^5\) Three convenient measures illustrate this growth in Indonesia: subscriptions and users, domain name registrations, and peak traffic.

As with the rest of Asia, the Internet started growing substantially in Indonesia in the mid-1990s, but the pace remained relatively slow compared with its South East Asian neighbours. Lack of basic communications infrastructure constrained uptake. In mid-2000 Indonesia’s population of 210 million shared only 7.5 million telephone connections, three million of which were in Jakarta. Teledensity (that is, the number of phone connections for the total population) of 3.6% was well below that of Thailand (7–8%) and neighbouring Malaysia.


Indonesian rural areas typically had decrepit infrastructure and scarce phone lines. The availability of public phones illustrates both the lack of infrastructure nationally and the imbalance across regions. While in Jakarta the ratio of public telephones to population was around 61 phones per 10,000 people, in some outer regions this plummeted to only 1–6 phones per 10,000. Constrained by such infrastructural limits, connecting to an Internet service provider (ISP), particularly from rural areas, is very difficult.

It may be notoriously difficult to establish the exact number of Indonesian Internet users at any given time, but the trajectory is irrefutable. Prior to 1995 the Internet had been restricted to a handful of science students in the major universities. By the end of 1995 there were an estimated 15,000 Internet users in Indonesia, serviced by five commercial ISPs and the initial university-based network, IPTEKnet. As the Asian financial crisis hit in 1997–98 (triggered by the floating of the Thai baht in July 1997), subscription growth slowed. Despite experiencing economic problems that were ‘exceptionally serious by any historical or contemporary standard’ and ‘certainly much deeper than any other Southeast Asian nation’, Indonesian subscription growth resumed with 250,000 paid-up subscribers by September 1999, a six-fold increase since the end of 1996. Raw subscription numbers hide many more actual users. Corporate subscriptions are invariably used by multiple staff and, within a home, several members may use the same subscription. By 2001 there were 581,000 subscribers and 4.2 million users, leading to confident estimates of 800,000 subscribers and 7.55 million users by the end of 2003 (see Table 1).

6 APJII and I2BC (2001), Indonesia Cyber Industry & Market, PT Elex Media Komputindo, Jakarta, p 10, gives the Indonesian Telkom connections, but gives a different level of ‘teledensity’ (2.9%) on p x.
10 The figures are drawn from various sources, but broadly confirmed by those on APJII’s Website, http://www.apjii.or.id/dokumentasi/statistik.php?lang=ind, visited 28 July 2003.
Other measures generally confirm similar growth. The Internet boom has encouraged a raft of Internet service providers. By June 2001, 150 ISP licences had been issued (although only 60 were actually operating).\textsuperscript{11} By March 2003, 186 licences had been issued to ISPs, 121 of whom were members of the Indonesian Association of Internet Service Providers (APJII), indicating a likelihood that their businesses were active.\textsuperscript{12}

Another common measure of growth is the increase in ‘Indonesian’ domain names, that is, Internet addresses ending with the Indonesia-specific ‘.id’. During the early years these doubled annually, peaking at more than 4,200 new domains in 2000. From 2001 new ‘.id’ domains began to decline, in what APJII regarded as part of a global slowing in dot.com enterprises, although it may also indicate that Indonesian companies preferred to use ‘generic’ or ‘universal’ domains (eg ‘.com’ or ‘.net’). Analysts have observed that ‘there is a perception in the community generally which infers that the use of the ‘.com’ domain as the representation of, or identity for, an e-Business on the Internet holds a more prestigious value compared with the use of a ‘co.id’ domain’.\textsuperscript{13}

\textsuperscript{11} The ISP figures are given in Muhamad Ihsan, Fadjar Adrianto, Salim Shahab and Achmad Adhito Hatanto (2001), ‘Akan Beraksi pada Tahun ini’, \textit{Warta Ekonomi}, No 22, Yr XII, 4 June, pp 20–21, which compares with APJII & I2BC 2001, p xi.

\textsuperscript{12} ISP licence holders are not required to be members of APJII. However they would be likely to join once their business was operational so as to obtain APJII support, such as the allocation of an IP address and connection to the Indonesian Internet Exchange (IIX), which provides Indonesian ISPs with interconnection without having to go through international providers. The statistics for 2003 are from http://www.apjii.or.id/dokumentasi/statistik.php?lang=ind&PHPSESSID=d3b14b2a30c5ab04aab0941e716d1fd3 visited 5 August 2003. The page was updated on 30 June 2003.

\textsuperscript{13} Gerardus Polla, Budi Rahardjo, Indra K. Hartono, S. Suyanto, Adi K, and Hengky (2000), \textit{Riset Domain CO.ID: Laporan Teknis Analisis tingkat kepuasan dan keamanan...
Table 2. Indonesian domain names.

<table>
<thead>
<tr>
<th>Year</th>
<th>New domains</th>
<th>Total domains</th>
<th>New domains</th>
<th>Total domains</th>
</tr>
</thead>
<tbody>
<tr>
<td>1995</td>
<td>87</td>
<td>87</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1996</td>
<td>240</td>
<td>327</td>
<td></td>
<td></td>
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<tr>
<td>1997</td>
<td>722</td>
<td>1,049</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1998</td>
<td>1,484</td>
<td>2,533</td>
<td>1,479</td>
<td>1,479</td>
</tr>
<tr>
<td>1999</td>
<td>2,163</td>
<td>4,696</td>
<td>2,148</td>
<td>3,627</td>
</tr>
<tr>
<td>2000</td>
<td>4,266</td>
<td>8,962</td>
<td>4,219</td>
<td>7,846</td>
</tr>
<tr>
<td>2001</td>
<td></td>
<td>3,478</td>
<td>11,324</td>
<td></td>
</tr>
<tr>
<td>2002</td>
<td>3,183</td>
<td>14,507</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2003 (June)</td>
<td></td>
<td>1,750</td>
<td>16,257</td>
<td></td>
</tr>
</tbody>
</table>

Note: This table is a compilation from two primary sources. Figures up to 1998 are from Budi Rahardjo (2002), ‘Indonesian Internet Statistics’, unpublished report, PT INDOCISC & PT Insan Infonesia, version 1.7, downloaded from www.insan.co.id/indonesia-Internet-statistics.pdf (3 September). Figures for 1998-2003 are from www.apjii.or.id/dokumentasi/statistik.php?lang=ind&PHPSESSID=d3b14b2a30c5ab04aab0941e716d1fd3, visited 5 August 2003 (which is sourced to www.idnic.net.id). There are minor discrepancies between these two sources, but these are not significant.

Nonetheless, by June 2003, there was a total of 16,257 ‘.id’ domains (see Table 2).

Perhaps the most succinct and dramatic measure of the expansion in the Indonesian segment of the Internet is the volume of ‘traffic’ it carries (in Megabytes\(^\text{14}\) per second). Between February 1999 and March of 2003 the peak traffic carried by the Indonesian Internet Exchange – through which Indonesian ISPs exchange traffic without having to go via expensive international connections – increased a massive 300-fold, from 2.05 MBps to 620.595 MBps over just four years (see Table 3).

While helpful, all these measures – subscriber numbers, Indonesian domain registrations and traffic volume – provide only a very incomplete picture of the extent of the country’s Internet usage. As an indicator of Internet social practice, the most revealing statistic may well be the konsumen dalam upaya peningkatan penggunaan domain CO.ID, Tim ccTLD-ID & APJII, Jakarta, p 8 (downloaded from http://www.apjii.or.id/dokumentasi/, visited 28 July 2003).

\(^{14}\) Internet content is measured in binary digits (0 or 1) called ‘bits’, with eight bits equal to one byte, one thousand bytes in a ‘kilobyte’ (Kb) and one thousand kb in a megabyte (Mb). Speed is measured in units per second (eg Kbps).
fact that total user numbers are growing at a much faster rate than subscribers, from a factor of 3.5 in 1996, to 6.75 in 2002, to 9.4 in 2003, which illustrates a much greater uptake via non-subscriber (public) access than subscriptions. Noteworthy too is the fact that Internet users as a percentage of total population have increased substantially in recent years, with 7.55 million users by the end of 2003 comprising about 3.5% of the population, up from only 2% in 2001.

This growing preference by Indonesians to use the Internet without taking out a subscription with an ISP may be due to low teledensity (referred to above), low level of personal computer ownership and general economic constraints. Income levels make personal computer ownership levels (1.1 computers per 100 inhabitants) low, even by South East Asia’s standards.\(^{15}\) Wage figures from the Indonesian Central Statistical Bureau (Badan Pusat Statistik, BPS) suggest that the cost of the cheapest personal computer is well over the median monthly earnings of the overwhelming majority of working Indonesians. For instance, BPS figures demonstrate that the weekly earnings of workers in the manufacturing industry and in the hotel sector were around rupiah 50,000 in early 1999 when the cheapest personal computer cost about three million rupiah. Our observations and anecdotal evidence suggest that this price was well over the monthly income of all but senior executives and successful professionals, and even exceeded the per capita gross regional domestic product of at least four of the 26 provinces for which

\(^{15}\) According to ITU 2002 statistics, the estimate of the number of personal computers per 100 inhabitants in Indonesia is 1.10, compared with the world average of 9.22. Indonesia is considerably lower than Singapore (50.83), Malaysia (12.61), Brunei (7.31), Thailand (2.78) and the Philippines (2.17), although higher than Vietnam (0.98), Laos (0.33), Cambodia (0.15) and Myanmar (0.11). Website: http://www.itu.int/ITU-D/ict/statistics/atglance/Internet02.pdf, p 2, visited 6 August 2003.
For the vast majority of Indonesians, the basic requirements for private Internet use – a phone line, a computer and an ISP subscription – are well beyond reach.

Public access Internet facilities

How then do we explain the fact that the number of Internet users has so greatly outstripped even the number of personal computers in the country? Most plausibly, it is due to a burgeoning expansion of public access points that offer the Internet to a growing number of people who could not otherwise afford it.

The popularity of public access Internet emulated an earlier boom in public telephone and facsimile services, through the government-owned and private ‘wartel’ (warung telekomunikasi, telecommunication café/kiosks). In the early 1980s it was not uncommon to have to queue even in lower-middle-class areas of Jakarta to make a call from the sparse scattering of public telephone booths. Mass public access to telephony began only in the mid-1980s when the wartel began to dot the Indonesian urban landscape, providing local, national and international phone and fax links. By the early 1990s there were 25,000 public phones and 800 wartel around the country, and this expansion of the wartel continues, with the number of wartel phones soaring by 23% nationally in the period 2000–2001 alone.

While the number of Indonesian provinces was increased to 33 in restructuring after the fall of President Suharto, the BPS still provides data according to the earlier division into 26 provinces. According to BPS data cited in Warta Ekonomi, supra note 11, at p 81, the ‘provinces’ of Bengkulu, Nusa Tenggara Barat, Sulawesi Tenggara and Maluku had a per capita gross regional domestic product of less than rupiah three million (based on 1999 prices).

According to ITU statistics, there were only 2.3 million PCs, but four million Internet users (or 1.10 PCs compared with 1.91 Internet users per 100 inhabitants). Website: http://www.itu.int/ITU-D/ict/statistics/at_glance/Internet02.pdf, p 2, visited 6 August 2003.


telephony than do non-wartel (stand-alone) public phones. In Jakarta, for example, the ratio of wartel phones to public phones was 115:61 per 10,000 people. In the least serviced outlying regions, wartel still provide between 5 and 25 phones per 10,000 population, compared with only one to six public phones per 10,000. For the vast majority of Indonesians without personal phones, the wartel provides their phone and fax communications.

With the establishment of commercial Internet service providers in 1995, many wartel added Internet to their existing telecommunications facilities, and adopted the name ‘wartelnet’ (Internet telecommunication kiosks) or increasingly ‘warnet’ (Internet kiosks). More commonly in the early years of Internet growth, cafés or warung (roadside stalls selling food) set up a couple of computers at pay-by-the-hour rates. The early popularity of these warnet helped sustain Internet growth despite the post-1997 economic malaise in Indonesia. In 1998, when the Internet was accessible to subscribers in more than a hundred cities and towns, most provincial capitals had public access points. By the end of 2000, there were between 1,500 and 2,500 warnet operating in cities and towns across the country, increasing at an astronomical 30% per annum.

If there is a divide between wealthy ‘home dial-up’ subscribers and the public warnet users, unequal access to the Internet is not solely based on income. It has a geographical dimension. The greater earning power of Jakarta residents and the capital’s better infrastructure are reflected in the fact that 75% of Internet subscribers and users are located there. Of the remainder, 15% are in Indonesia’s second city, Surabaya, with 5% elsewhere in Java, leaving the remaining 5% scattered across the rest of the archipelago.

The locations of warnet underline this second index of exclusion. In August 2000, the Indonesian Internet Café Association (AWARI), which provided a virtual forum for exchange of information on the industry, listed 364 warnet. It had a comprehensive list of these in Jakarta and the surrounding area – 265 in all – but only a handful in other cities in

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20 APJII & I2BC, supra note 6, at p xi.
21 APJII & I2BC, supra note 6, at p 16 gives a figure of 1,500, while AWARI (the Indonesian Internet Café Association) estimated 2,500, according to Hendar, D. Rusdianto Erawan, Edi Simon Siahaan and Achmad Adhito Hatanto (2001), ‘Warnet pun Disikat’, Warta Ekonomi, No 44, Yr XIII, 5 November, pp 38–43, particularly p 39.
22 P3TIE, supra note 8, at p ix.
Java and Bali. The Idaman.com Website (owned by another association of *warnet*) provided a more representative list of 340 public access points across the archipelago. Given that membership of these groups and the provision of information to such Websites is voluntary, no such list would be exhaustive. But 314 *warnet* on the Idaman list provide sufficient information for verification of their existence. Of these, 264, or nearly 85% were located on the island of Java, where a little over half the Indonesian population lives. On this list, the capital, Jakarta, accounted for 80, or just under a quarter, of all public access points, although only about 5.5% of the nation’s population lives in Jakarta. Another 105 were in the three provincial capitals (Surabaya, Bandung and Semarang) and 42 in Yogyakarta and Solo, the old university towns and the cultural heartland of Java. The remaining 37 were spread across several district capitals. Outside of Java, we found no listed public access Internet outside of large provincial capitals and the Bali tourist areas.

By mid-2001, an industry study using data from the Warnet Directory (at natnit.net) claimed that 1,151 *warnet* had registered on the online directory, but declared that the actual number across Indonesia might be more than 2,000, since many ‘do not yet have a licence to operate’.\(^\text{23}\) This Indonesian Cyber Industry study noted that more than half the *warnet* they had identified were in Jakarta, where the ratio was greater than one *warnet* per 20,000 people.\(^\text{24}\) The ratio fell to around one *warnet* per million inhabitants in places such as West Nusa Tenggara, Sumatra, Sulawesi and Maluku.

Thus, the phenomenal boom in *warnet* – like the geographic concentration – was most evident on Java. In Yogyakarta, for example, a central Java town renowned as a centre of tertiary education and one of fastest provincial capitals as regards Internet uptake, the first three *warnet* opened in September 1996, growing to at least 31 by mid-2000.\(^\text{25}\) Similar growth was evident in Malang in East Java, also with a high proportion of students among its population of about 700,000. As in Yogyakarta, Malang’s first *warnet* opened in September 1996; within

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\(^\text{24}\) Although the average number of computer screens per *warnet* was not given, our observations in November 2001 in the Cikini area of central Jakarta suggest that an average of about 15 screens is likely, which would give Jakarta a ratio of one *warnet* screen per 1,300 people.

\(^\text{25}\) For an account of early Internet use in Indonesia, particularly in Yogyakarta, see Hill, D. T., and Sen, K. (1997), ‘Wiring the warung to global gateways: the Internet in Indonesia’, *Indonesia* (Cornell University), No 63, April, pp 67–89.
four years the number had grown to 52, 38 of which were near one of the town’s several universities. Even in the little East Java town of Blitar, with a population of only 120,000, there were four warnet by the end of 2000. In a micro-study of the warnet industry in Malang and Blitar undertaken in September–October 2000, Paul Harvey calculated that there was one warnet computer for every 2,360 inhabitants in Malang and every 5,833 in Blitar.

Data from 2002 reinforce the general trend of warnet diffusion. The government’s Centre for the Study and Application of Information Technology and Electronics (P3TIE) provides a breakdown of 1,480 warnet (based on natnit.net data), which indicates that 35% are in Jakarta, 25% in West Java, 15% in Central Java and Yogyakarta, 11% in East Java, 6% in Sumatra, 3% in Bali and West Nusa Tenggara, with 2% each in Kalimantan and Sulawesi, and the remaining 1% spread across Maluku and Irian Jaya. Warnet are clearly spreading rapidly through Java and Bali, but not yet to the corners of the archipelago, and not all citizens are being drawn equally into the cyber community.

To believers in the transformative benefits of the Internet, the growth of warnet offered one answer to the problem of the enormously unequal distribution of technology generally, and IT in particular, both across regions and across social classes in Indonesia. Referring to the ‘cyberspace divide’ separating those with or without access to the Internet, Harold Thimbleby has quipped that ‘serfs don’t surf’. Not so, argued Indonesia’s Deputy Minister for State Efficiency (Deputi Menteri Pendayagunaan Aparatur Negara) J.B. Kristiadi, in August 2001, claiming that among the ‘approximately two and a half million Internet users using [...] warnet’ were farmers in several locations throughout the country who were using them to monitor price fluctuations

27 Harvey, P. W. (2000), ‘Bisnis Warung Internet di Malang dan Blitar’, unpublished Fieldstudy Report, Australian Consortium for ‘In-Country’ Indonesian Studies, Perth, pp 12–15. We would like to thank the author for permitting access to this unpublished document. Harvey gives a total of 339 warnet computers in Malang and 24 in Blitar. He uses different population figures from those given in this paragraph. On the basis of the population figures given in this paragraph, the ratio would be slightly lower, with one warnet computer per 2,065 people in Malang and per 5,130 in Blitar.
28 P3TIE, supra note 8, at p 19. The P3TIE estimate that, by 2002, there were about 261,000 warnet nationally, would seem hard to substantiate.
29 Thimbleby is quoted in Mann and Stewart, supra note 3, at p 31.
for their agricultural commodities, thereby maximizing their market price!³⁰

Warnet do make such access possible, but in doing so they have to challenge entrenched disparities. The concentration of financial resources and infrastructure, primarily in Jakarta, Java and Bali, throughout the New Order years is well documented. Sought-after foreign investment provides one indicator of this convergence, with Jakarta and neighbouring West Java absorbing more than half the nation’s total (for the period 1967–91), and Java and Bali garnering about 70%.³¹ At best, the Internet has been unable to escape the centripetalism that marked the last 30 years of Indonesian development; at worst, it is adding a new layer to regional inequality. Such disparities are often dismissed in discussions of the growth of the Internet globally or even nationally, but must be taken into account if we are to understand how (or if) the Internet is transforming communication practices in Indonesia.

In addition to their geographical concentration, warnet are increasingly falling prey to concentration of ownership, as large national and multinational firms move into a sector of the economy originally dominated by small and medium-sized enterprises. In the early years warnet were established by two types of owners. On the one hand, the biggest player was the government postal company, PT Pos Indonesia, which, in partnership with its own ISP, Wasantara.net,³² established small Internet stalls – sometimes with only three or four terminals – in public post offices around the country, quickly growing into the widest network of warnet in the country. At its peak Wasantara.net linked about half of the country’s major post offices to the Internet, but, struggling under the financial weight of this early expansion, in April 2002 it was forced to close many of these, leaving only about 75 cities in the network. This remains, however, the largest geographic spread of any Indonesian ISP and an important adjunct to the traditional postal service.³³ More

³³ P3TIE, supra note 8, at p 14.
modest *warnet* chains were established by other ISPs, which saw an economic logic in offering both ISP services and linked *warnet*.

More commonly, however, *warnet* developed as a high-tech ‘cottage industry’, with individual proprietors opening their own *warnet* – usually one, but sometimes a small chain of half a dozen around a town. Until at least 2000, the industry was the province of what are referred to in Indonesia as ‘UKM’ (*usaha kecil dan menengah*, or small and medium-sized enterprises).  
In Yogyakarta the first *warnet* was in the city’s post office, but it was small, unattractive and poorly patronized. The next two, established within weeks on the borders of the largest university in the town by local business people, were stylish, appealed to students, and drew a steady patronage. A similar pattern emerged in Malang. The first *warnet* there was also established by PT Pos’ Wasantara.net, but others rapidly appeared both in the town centre and around the various universities. While the majority (70%) were not actually managed by the owners, particularly in the university environs, it was common to find *warnet* being established by recent graduates who pooled their funds to buy the computers and other equipment necessary. The *warnet* generally had only about six or seven computers, each at a cost of about rupiah 4.5 million if new (or rupiah 3.1 million if second-hand), representing a modest ‘start-up’ cost of less than US$2,000. Nonetheless, the likelihood of forging a profitable small enterprise with steady cash flow was good as demand steadily increased, with Harvey estimating that more than 4% of Malang’s population used the *warnet*, rising to about 25% for the city’s university students.

At the beginning of the new millennium, international IT companies began to move into the *warnet* market, squeezing the cottage-industry owners. In mid-2000 the multinational MIH (Myriad International Holding), which had spread to 50 countries since its establishment in South Africa in 1986, entered the Indonesian market as ‘M-Web Indonesia’. Initially M-Web bought up a variety of ISPs and Internet portals (including Astaga! and the Satunet group). By June 2001 the company had invested US$10 million in Indonesia (in the hope of generating half that figure in revenue within a year) and owned more

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35 Information on *warnet* in Malang and Blitar is based on Harvey, 2000.
36 Harvey, *supra* note 27, at pp ix–xii.
than 600 computers connected to the Internet in the key cities of Jakarta, Yogyakarta and Surabaya. Its strategy was to establish ‘Student Internet Centers’ on major campuses. The University of Indonesia Psychology Faculty M-Web centre, for example, had 120 screens and charged students rupiah 5,500 per hour. The appeal of these large, fast and well equipped Internet centres filtered out of the campuses and attracted other users. After a hectic two years of expansion, M-Web declared itself ‘the largest Internet center operator in Indonesia’ with nearly 1,400 screens in 20 centres across Java. Investors like M-Web signalled that by 2002 public access Internet had undergone a transition from local warung to ‘branded multinational centre’.

In this, M-Web was not without serious competitors, with other big (and often well connected) investors including Indonesia’s national Telkom, Myohdotcom, the powerful Indonesian Lippo Group conglomerate (through the holding company Across Asia Multimedia Ltd, chaired by Jonathan L. Parapak, former Secretary-General of the Tourism, Post and Telecommunications Ministry during the late Suharto period), and PT Semesta Citra Intan (owned by the Minister for Trade and Industry in the Megawati Sukarnoputri Cabinet, Rini M.S. Soewandi). Most large companies primarily targeted eager university students, who had a high demand for, and familiarity with, Internet use. Telkom began diversifying into warnet on campuses early in 2001, signing collaborations initially with the University of Indonesia Economics Faculty and the Bogor Agricultural Institute, under the brand name ‘Cyber Campus’. Under these agreements, the warnet remained the property of the university, but Telkom provided the network access. PT Semesta Citra Intan, with its warnet branded ‘Planet Digital’, also eyed the potentially rich campus market, initially through Muhammadiyah University in Malang, but it branched out into sites in middle- and upper-class shopping malls, such as Jakarta’s Blok M Plaza.

Information on M-Web’s warnet activities is based on Fadjar Adrianto, Achmad Adhito Hatanto, Salim Shahab, Edi Simon Siahaan and Ferdinand Lamak (2001), ‘Terus Menangguk Rupiah di Saat yang Lain Susah’ (pp 10–16), and Fadjar Adrianto, Salim Shahab, Muhamad Ihsan and Edi Simon Siahaan (2001), ‘Menit-menit yang Menghasilkan Duit’ (pp 17–19), Warta Ekonomi, No 22, Yr XII, 4 June.

In November 2001, a Jakarta taxi driver with whom we spoke, knew the prices and levels of efficiency of a string of warnet around the city, and strongly recommended the UI W-Web centre as the best by far. He used it regularly to e-mail his family in North Sumatra.


Hendaru, D. Rusdianto Erawan et al, supra note 21, at pp 38–43.
For the small and medium-sized warnets, the competition from the Internet centre chains was fearsome: so much so that, when M-Web initially opened on Gadjah Mada University campus, the local branch of AWARI, the Yogyakarta Internet Café Association (AWAYO), launched a public protest campaign, including a spirited debate on the AWARI mailing list (http://groups.yahoo.com/group/asosiasi-warnet/messages). In May 2001, 100 AWAYO members passed a motion condemning M-Web’s arrival in Yogya. With a high density of small warnet in the university precinct, AWAYO Chairperson Stephanus Edi Pambudi declared, ‘We are worried that if M-Web enters the UGM campus it will set a tariff which will kill off the competition from warnet in the campus surrounds’. The Internet centres, often using satellite links to facilitate reliable high-speed connections, can easily outflank the smaller operators, around 75% of which use slower, more erratic dial-up ISP links. But the Internet economy is enormously volatile and Goliath may be no match for David. After less than three years in Indonesia and 12 months after declaring M-Web ‘Indonesia’s largest online service provider, providing total Internet solutions for corporate, SME, as well as individual users’, MIH sold M-Web Indonesia’s assets and left the country.

In fact, not all warnet chains posed such direct competition to small local entrepreneurs. The local publicly-listed company, Myohdotcom Indonesia, collaborated with a multinational and the Indonesian government in an attempt to spawn a national network of small franchisees operating 9,000 ‘technology and information stalls’ (Warung Informasi dan Teknologi, Warintek), akin to warnet, but also providing IT education and training. In the project, known as ‘Warintek 9000’, Myohdotcom (which developed the business model) collaborated with the Office of the Minister of State for Research and Technology (KMNRT) and Hewlett-Packard Indonesia (which provided the hardware). Launched in February 2001, the ambitious target was to have warintek operating across all of Indonesia’s 8,000 subdistricts.

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41 Fadjar Adrianto et al, supra note 37, at pp 17–19, specifically p 19.
43 Website: http://imt.co.id/tmp/_ol0425,03,0918,49liq.html, visited 28 July 2003, by which date all reference to the Indonesian operations had been removed from the MIH Website, and the M-Web Indonesian Website address was defaulting to their Zambian operations. M-Web Indonesia’s former President Director and COO, David Burke, headed up the new company, IMT, which bought M-Web Indonesia’s assets.
(kecamatan), with an additional 1,000 in regions of high population density, by 2004.\textsuperscript{44}

According to Myohdotcom Indonesia’s Corporate and Marketing Director Rendra Hertiadhi, the aim was ‘to make the technology down to earth’ [membuat teknologi itu membumi].\textsuperscript{45} The warintek would all be networked and provide Internet access (like conventional warnet) as well as training programmes and marketing opportunities for local products. Within six months of the concept launch, Myohdotcom claimed to have opened more than 90 warintek with more than 1,000 terminals, and to have received more than 2,000 applications from potential franchisees to join the project. Predictably, universities such as the Medan State University (Universitas Negeri Medan) were among the early participants, and most initial warintek were established on Java (or north Sumatra). UNESCO in Bangkok also backed the concept, joining with the local government in south Sumatra to:

establish WARINTEK in South Sumatra Province as an access community center . . . to provide rural and remote communities with public access to information technology, especially the Internet, and with the training to utilize it effectively. The ultimate goal of this project is the empowerment of community members and the use of such technologies for a variety of applications benefiting sustainable human development.\textsuperscript{46}

Under their business model, Myohdotcom (which charged a franchise membership fee) projected that a franchise holder would break even within about 1.7 years, assuming the warintek operated for eight hours a day, charged an hourly tariff of only rupiah 3,000 and maintained an occupancy rate of 50%.

The Warintek project also targeted non-urban areas, attracting interest from the private sector as well as schools and government agencies. In a further attempt to draw people outside of the major cities under the IT mantle, in August 2001 the Research and Technology Ministry launched its first ‘mobile warintek’. From Surabaya the small minibus


toured rural areas of East Java and Bali, demonstrating multimedia and information search applications using on-board computer facilities and satellite Internet link (VSAT).\textsuperscript{47}

Initial ambitious targets for Warintek soon had to be pruned back. At the end of 2002, Myohdotcom Indonesia complained that the banks were loath to provide sufficient finance for warintek, noting that only 4,000 of the target of 9,000 warintek had been established.\textsuperscript{48} Although still mainly on Java, some were dotted across 30 provinces. Local governments, empowered under the post-Suharto regional autonomy provisions, were taking the initiative, with the East Nusa Tenggara government, for example, reportedly urging district heads (Bupati) in 14 regions to allocate funds (of about rupiah 20 million each) for the establishment of a district warintek.\textsuperscript{49} Utari Budiharjo, the Assistant Deputy for Information Network Development (Pengembangan Jaringan Informasi) in the Research and Technology Ministry, reported requests from Papua for the development of 500 warintek spread around its kabupaten (districts), although it is not clear how many of these have actually been completed.\textsuperscript{50}

The proliferation and diffusion of warnet (including warintek) are reason enough for these public access facilities to become the most likely connection point for most Internet users. But equally crucial is price. Encouraging the spread of public access Internet in 1999, Onno W. Purbo showed that a warnet could be viable with an hourly rental of rupiah 5,000 to 10,000, and noted that larger warnet might be able to reduce this to as little as rupiah 3,500, or roughly between 35 cents and US$1.\textsuperscript{51} Heightened competition, particularly in popular urban areas, has driven hourly rates even lower in many locations, and flexible ‘off-peak’ rates late at night may drop to below rupiah 2,000, with


\textsuperscript{51} Purbo, O. W. (1999), \textit{Teknologi Warung Internet}, PT Elex Media Komputindo, Jakarta, pp 143–144.
friends sometimes sharing the cost by ‘surfing’ together. Nonetheless, even these tariffs place the Internet beyond the reach of many in a country where the official minimum daily wage is rupiah 5,000 in the capital, and lower in many regional towns.

An even more economical mode of access would be necessary to optimize Internet use in the community. Onno Purbo recognized that educational institutions – not just universities and schools, but pesantren (traditional Muslim religious schools) – provided one pivotal possibility for shared, low-price, high-volume Internet connections. He showed how one technical school in Ciamis could provide all its students with Internet access for only rupiah 1,000 (about US$0.10) per person per month. Similarly, another school in Yogyakarta charged students only rupiah 5,000 monthly. Both recouped their investment in infrastructure and ISP connection costs within a few years. With evangelical zeal, Purbo argued that, if fostered, promoted and supported, educational and public access sites could enable 20 million Indonesians – about 9% of the population – to access the Internet by 2005.

Growth towards Purbo’s goal continues unevenly. Although the campuses were the initial Internet gateway to Indonesia, out of the country’s 1,300 universities, only just over 200 actually had the Internet by the end of 2001. Perhaps more significant in providing the skilled technicians to service the IT industry, by the same time, one-quarter of Indonesia’s 4,000 vocational schools were linked to the Internet largely as a result of the drive of Dr Gatot H.P., the Director of Vocational Schools in the Ministry of Education.

Supporting this enhanced diffusion of access and expertise into the community, is what has been dubbed an ‘Indonesian Internet grassroots


54 His optimistic calculations include: 150,000 telephone kiosks (wartel) used by 3–6 million people; 1,000 Internet kiosks (warnet) with 200–400,000 users; 1,300 universities, enabling 3–5 million students online; 4,000 vocational high schools, connecting 3–4 million students; 10,000 high schools, with 5–7 million student users; and 10,000 pesantren reaching 3 million pupils (paraphrased from APJII & 12BC, supra note 6, at p 128).

Plotting public participation on Indonesia’s Internet

begun and led by expert activists such as Onno Purbo, Michael Sunggiardi, Adi Nugroho, R.M.S. Ibrahim and others, who eschew copyright protection to make their work available free via the Indonesian Digital Knowledge Foundation (http://www.bogor.net/idkf/). They have developed a comprehensive strategy to spread cheap Internet access by side-stepping the expensive national telecommunications oligopolies that set the rates for timed telephone connections. Purbo advocates the use of high-speed (11–54 Mbps) wireless local area network (LAN) Internet connections to link directly via antennae to satellite, obviating the need for a timed Telkom phone connection. The infrastructure is shared, owned and used collectively by a neighbourhood or a network of warnet. He urges the sharing of an ISP subscription to a 24-hour ‘leased line’ by a collection of households, in what he dubs an ‘RT/RW Net’ (neighbourhood net). This would enable entire neighbourhoods of 40 or more houses to be connected to the Internet cheaply through a single collectively owned infrastructure. For a cost of only about US$150 for the antenna, an LAN can have 24-hour Internet access at 11 Mbps with shared monthly running costs of only rupiah 330,000 (about US$30).

In advocating such communal ownership, these activists draw upon many precedents for such a social practice in Indonesia. One is Interkom, a cable-based communication technology still used in poor communities in Bandung, which works much like ‘a souped-up telephone party line’. Interkom ‘allows for a dozen or more people to communicate on a single line, and possesses audio quality that approaches that of a cheap Sony Walkman’. The network is built and paid for by users themselves. Similarly, with the boom in satellite television after 1983, it became relatively common for a neighbourhood to band together to share the

56 Purbo, supra note 4, particularly pp 31–38.
57 Purbo, supra note 55, at p 11. Onno W. Purbo, a proponent of the ‘copy-left’ (ie copyright-free intellectual property) philosophy, has kindly provided us with three CD-ROMs of his articles and Powerpoint presentations, written over the past several years. We wish to acknowledge with gratitude Dr Purbo’s enormous contribution thereby to our research. This collection includes several presentations, delivered in a variety of forums through 2000, promoting neighbourhood Internet networks (RT/RW Net), including ‘ppt-warung-Internet-10-2000’. Purbo travels the country running demonstrations of ‘wireless Internet’, which provides 24-hour-a-day Internet access without timed telephone charges, with payment only to the ISP. The wireless speed of 11–54 MBps is up to one thousand times faster than the Telkom maximum of 54 KBps. (See ‘Demo Instalasi Wireless Internet’, http://www.kominfo.go.id/agenda_detail.asp?id=30, visited 7 August 2003.)
58 Barker, supra note 7, at p 175.
cost of a single parabolic antenna, which was then cabled to participating dwellings. Similar technology could be harnessed to provide faster Internet access than conventional telephone landlines, particularly since much of the current infrastructure is old, relatively slow, copper (coaxial) cables, rather than the faster, more efficient fibre-optic links. Techno-activists argue such innovative strategies demonstrate that the technology is available to connect Indonesian users to the Internet for relatively modest outlay through either communally owned infrastructure, educational institutions, or via public warnet.

User profiles

Let us now turn our attention to the Internet users themselves. Who uses the Internet (particularly via public access venues) and for what purpose?

The conviction of promoters such as Onno Purbo that educational institutions will be critical for the future growth of Internet appears to be well founded. Educational level is a key determinant of Internet use. As already mentioned, the Internet initially entered Indonesia through the universities and research institutes, and, as figures from 2000 indicate, virtually all Internet users have at least an upper-secondary school education (see Table 4).

In building up a profile of the Internet user community we draw substantially upon the most ambitious Indonesian Internet industry study to date, which interviewed 1,500 individual Internet users across 10 Indonesian cities (with follow-up focus group discussions with industry insiders). In his analysis of the data, Harry Susianto noted that the percentage of people who accessed the Net from Internet kiosks (the largest proportion, at 42%) or from the office (41%) was twice that of those who subscribed to the Internet at home (21%). One-third of users did not even own a computer.

60 APJII & I2BC, supra note 6, at p 129.
61 Mars-e, Potensi Bisnis & Perilaku Penggunaan Internet di Indonesia, June 2000, cited in P3TIE, supra note 8, at p 17.
62 The sample comprised 65% men and 35% women, across three age bands, 32% being 14–25-year-olds, 38% being 26–35-year-olds, with the remaining 32% in the 36–55 year bracket. The cities were Jakarta, Surabaya, Medan, Bandung, Semarang, Denpasar, Makassar, Balikpapan, Yogyakarta and Batam. The research methodology and sampling details are provided in APJII & I2BC, supra note 6, at pp 17–24.
Table 4. Educational level of Internet users.

<table>
<thead>
<tr>
<th>Level of education</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bachelors degree (Sarjana)</td>
<td>43</td>
</tr>
<tr>
<td>Upper secondary college (SLTA)</td>
<td>41</td>
</tr>
<tr>
<td>Masters degree (Sarjana muda)</td>
<td>9</td>
</tr>
<tr>
<td>Higher degree (Pasca Sarjana)</td>
<td>5</td>
</tr>
<tr>
<td>Primary or lower secondary college (SD/SLTP)</td>
<td>2</td>
</tr>
</tbody>
</table>

In its analysis of this Internet industry study data, PT Pacific Rekanprima’s research team sought to identify the ‘demographics, lifestyle and habits’ of Indonesia’s Internet users. It identified six broad user types by disaggregating the sample according to ‘technographic’ segmentation, that is, ‘categorization on the basis of motivation, desire and capability to invest in technology’.

This attempt to flesh out the personal and preferential characteristics of types of users and their patterns of usage (for marketing purposes) does raise methodological questions, but the findings warrant consideration.

Categorized as ‘light users’ with an ‘entertainment orientation’ were the teenage ‘media-junkies’, who comprised 10% of the respondents. They are seeking entertainment and pleasure, and use the Internet to communicate with their peers via e-mail. They do not regard the Internet as a status signifier, but rather as a communal service, perhaps reflected in their tendency to frequent Internet kiosks, which provide Net access without interference from figures of authority such as parents. Also relatively light users are the ‘young socialites’, 24.7% of the sample, aged in their 20s, who use Internet (and mobile phones) to communicate with peers for social and entertainment purposes. ‘Medium users’ include 9.3% of ‘traditionalists’, aged between 26 and 35, who use the Internet at their office (but do not purchase or use personal computers). A substantial 36% of the sample was grouped as ‘digital hopeful families’. They were 26–35 years old, but with an enhanced interest in the benefits of new technologies, and gave a higher priority to buying technological goods, particularly when these could be enjoyed by the whole family.

64 PT Pacific Rekanprima Research Team (2001), ‘Portrait of Internet users in Indonesia – findings of quantitative research of the Internet’, in APJII & I2BC, supra note 6, at pp 159–167, which cites Kotler, P. (2000), Marketing Management, Prentice Hall, New Jersey, as the source for this approach. The following discussion of the technographic segmentation is drawn from the Pacific Rekanprima analysis.
The two ‘heavy user’ groups were both relatively small: 5.7% of the sample were described as ‘bossy’ or ‘hand-shakers’; between 36 and 55 years of age, they tended to be in established career positions that made them relatively independent, strong forward-planners and purchasers of other high-tech products. Finally, 13.7% were regarded as ‘techno-strivers’ or ‘young executives’ who not only had ‘a positive attitude towards modern technology’ (p 165), but who used such tools to boost their personal success, using Internet for both work and social purposes.

While such speculative analysis may sketch out some segmentation characteristics in the otherwise rather undifferentiated population of Internet users in Indonesia, the findings need to be interpreted within the limits of the sample. The research was undertaken to assist the IT industry to develop more effectively by identifying areas of market potential and impediment ‘for those who plan to exploit the challenges and opportunities of this dynamic industry’. This undoubtedly skewed the sample, since those selected had a minimum total monthly expenditure of rupiah one million, and 63.5% had a PC at home (compared with about five PCs per 100 households nationally). They were largely comfortably well-off white-collar workers, in the middle-aged to older age bracket. Significantly, 68% of the sample was older than 25 years, while our (albeit limited) observations and anecdotal evidence suggest that the majority of warnet users, for example, are in their teens or twenties. Harvey’s micro-study of warnet in Malang, for example, concluded that students comprised by far the largest category of Internet customers, both in the university environs and the city centre, with teenagers the next substantial grouping. These two groups provided 57% of Internet users in the city warnet and a massive 92% in the university environs, far outstripping the office workers and professionals in both locations (see Table 5).

Two broad pictures then emerge of the Indonesian Internet user: one of the white-collar office user and the other of a younger warnet user. Both have relatively high educational levels; both have adapted to using the Internet as part of their regular routine, irrespective of whether they

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65 Quotation from Foreword to APJII & I2BC, supra note 6, at p iii, by APJII Executive Director, Pandji S. Choesin.
66 APJII & I2BC, supra note 6, at pp 19–20, and p x.
67 This table is drawn from Harvey, supra note 27, at p 36, which provides estimates given by the warnet managers rather than precise statistical analysis. Harvey excludes Internet facilities actually on the university campuses from his survey.
may own a computer themselves; and in both, about two-thirds are male.

### Net use patterns

Much of the discussion about the impact of the Internet focuses on the dramatic ‘globalizing’ potential of the medium to cross the spatial boundaries of state and nation. Actual patterns of Internet use, however, may be highly culturally specific and vary considerably across communities of users. But is it possible to determine whether the patterns of Internet use in Indonesia differ markedly from those of other Internet communities? Is it even possible to determine the extent to which Internet users in Indonesia utilize Indonesian-language, Indonesia-based, or Indonesia-related sites and sources of information, rather than ‘global’ alternatives?

One indication of the presence of Indonesia on the Internet might be gained if we were able to determine the proportion of ‘Indonesian’ material consumed by Indonesians accessing the Net. Such measurement is problematic. However, Harvey’s Malang–Blitar micro-study provides a tiny snapshot of the relative prominence of Indonesian Websites compared with non-Indonesian sites in the Internet kiosks he surveys. Based on a limited selection of warnet computers’ ‘history’ files, he concludes that only 18% of the Websites were explicitly Indonesian (in the sense that they used the Indonesian language, or identified themselves with an Indonesian location or domain). These were most commonly portals (used for e-mail, ‘chatting’ and general information), or news and music sites in the Indonesian language. The largest single category of non-Indonesian Websites was pornographic (consumption of which did not require capacity in a particular language). This included about 25% of Websites accessed through warnet in Malang.
rising to 55% in Blitar (where the proportion of students using the facilities for academic use, e-mail or chatting was dramatically smaller). Recognizing the economic pull of pornography as an inducement for users, 10% of the warnet in Malang used pornographic ‘screen savers’, and none had a policy of prohibiting or limiting access to online pornography. Nonetheless, when asked to volunteer Internet usage patterns, no warnet managers admitted that their customers used the Internet primarily to view pornography.

James Harkness’ later study of warnet use by Malang students broadly reinforced Harvey’s findings. Responses by 200 surveyed students were broken down into 23 broad categories of usage, with the most popular being ‘chatting’ (46%), entertainment (45%), reading online magazines (36%), sports information (35%) and educational use (31%). Pornography ranked tenth with 20%, while only 14% indicated that they used the Net for political interests, which was in thirteenth place. The majority of respondents (54%) were spending between one and three hours a week on the Net, with 13% spending more than 10 hours.

The broad usage patterns identified by Harvey and Harkness in Malang appear common in warnet outside of Java, if a study by Adi Nugroho is indicative. He examined the proxy server used by half of the Internet cafés in Makassar, Sulawesi, over the last week of January 2002 (see Table 6). While 62% of second-level domains were so varied as to be statistically unhelpful, it was possible to identify usage patterns in the remaining 38%. Of these, the most frequently accessed is the global search engine, ‘yahoo.com’. Although the framework of this site is in English, it hosts tens of thousands of e-groups, more than 4,000 of which are associated in some way with Indonesia, and many of which use Indonesian as their preferred language (such as http://groups.yahoo.com/group/asosiasi-warnet/ for Indonesian warnet). The majority of the other ranked domains are readily accessed by Indonesian speakers, without the need for foreign language competence.

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68 Harvey, supra note 27, outlines his research methodology on p 7. His calculations regarding pornographic sites are based on the ‘history’ files (ie the sites accessed over the previous 2–3 days) of a sample of 40 computers from 10 warnet in Malang, and five computers from two warnet in Blitar.

69 Harvey, supra note 27, at pp xv & 49.

70 Harkness, supra note 52, at p iii. Harkness notes that 31% of males and 4% of females acknowledged that they accessed pornography online (p ii).

71 Harkness, supra note 52, at p 29.

72 The table of Adi Nugroho’s data for 20–27 January 2002 is taken directly from Purbo, supra note 55, at p 16.
Table 6. Usage patterns for some Internet cafés in Makassar, Sulawesi, during the last week of January 2002.

<table>
<thead>
<tr>
<th>Destination (language)</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>.yahoo.com (English)</td>
<td>6.96</td>
</tr>
<tr>
<td>.yimg.com (English)</td>
<td>6.77</td>
</tr>
<tr>
<td>.bolehmail.com (Indonesian)</td>
<td>4.69</td>
</tr>
<tr>
<td>&lt;error&gt; (ie incorrect input of target site)</td>
<td>2.98</td>
</tr>
<tr>
<td>.plasa.com (Indonesian)</td>
<td>2.52</td>
</tr>
<tr>
<td>.astaga.com (Indonesian)</td>
<td>2.02</td>
</tr>
<tr>
<td>.17tahun.com (Indonesian)</td>
<td>1.72</td>
</tr>
<tr>
<td>.doubleclick.net (English)</td>
<td>1.46</td>
</tr>
<tr>
<td>.extrajos.com (Indonesian)</td>
<td>1.40</td>
</tr>
<tr>
<td>.msn.com (English)</td>
<td>1.16</td>
</tr>
<tr>
<td>.akamai.net</td>
<td>1.00</td>
</tr>
<tr>
<td>.freebiespider.com (English)</td>
<td>0.85</td>
</tr>
<tr>
<td>.geocities.com (English)</td>
<td>0.76</td>
</tr>
<tr>
<td>.riekls.com (Indonesian)</td>
<td>0.75</td>
</tr>
<tr>
<td>202.53.225.</td>
<td>0.74</td>
</tr>
<tr>
<td>.chek.com (English)</td>
<td>0.61</td>
</tr>
<tr>
<td>.detik.com (Indonesian)</td>
<td>0.49</td>
</tr>
<tr>
<td>.adbutler.com (English)</td>
<td>0.44</td>
</tr>
<tr>
<td>.kompas.com (Indonesian)</td>
<td>0.40</td>
</tr>
<tr>
<td>.icq.com (English)</td>
<td>0.27</td>
</tr>
<tr>
<td>Other 2nd level domains</td>
<td>62.01</td>
</tr>
</tbody>
</table>

frequently accessed sites are search engines and Web-based e-mail sites such as yahoo, bolehmail, astaga and plasa (most of which are Indonesian), with news and online media, such as msn, detik and kompas, figuring next. ‘Pornography’ was the next most common category, with ‘yimg.com’ (a hardcore ‘pornoheaven’ photo download site) the second most popular site on the list. The other ‘pornographic’ site (‘17tahun.com’) contained only stories or text materials rather than visual pornography. Other studies, however, suggest that such pornographic traffic forms a relatively small proportion of Indonesian usage.

Onno Purbo has undertaken more detailed analysis of the most popular e-group site, http://groups.yahoo.com, to compile a comprehensive

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73 Plasa.com was set up by the multimedia and Internet division of the state telecommunications company PT Telkom Tbk, offering a free server for discussion groups, to compete with the e-group facility on yahoo.com (see Purbo, supra note 53 [file 08b.html]).
Table 7. Subject of Indonesian e-groups (with over 100 subscribers).

<table>
<thead>
<tr>
<th>Subject</th>
<th>Percentage of groups (total: 1,170)</th>
<th>Percentage of subscribers (total: 425,478)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Social functions (alumni, community, family, friends)</td>
<td>27.7</td>
<td>19.4</td>
</tr>
<tr>
<td>General knowledge (including IT)</td>
<td>20.9</td>
<td>19.1</td>
</tr>
<tr>
<td>Business (including import/export, employment)</td>
<td>14.9</td>
<td>15.5</td>
</tr>
<tr>
<td>Religion</td>
<td>12.6</td>
<td>12.7</td>
</tr>
<tr>
<td>Hobbies</td>
<td>9</td>
<td>11.1</td>
</tr>
<tr>
<td>Politics</td>
<td>7.4</td>
<td>7.1</td>
</tr>
<tr>
<td>Pornography</td>
<td>6.2</td>
<td>14.1</td>
</tr>
<tr>
<td>Economics</td>
<td>1.2</td>
<td>0.9</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>99.9</strong></td>
<td><strong>99.9</strong></td>
</tr>
</tbody>
</table>

picture of ‘the Indonesian community in cyberspace’. In 2001 he estimated there were about 49,000 e-groups, making this form of Net communication one of the largest and most concentrated. After an initial evaluation of more than 25,000 of these, he eventually restricted his sample to the 1,170 (4.5%) with memberships greater than 100 (several of which had more than 8,000 subscribers). The sample incorporated a substantial total of 425,478 subscribers (including an unspecified number of multiple users). His statistics (see Table 7) demonstrate that, contrary to widespread belief, neither pornography nor politics formed a basis for a substantial number of Net groups, although pornographic groups did attract a disproportionate number of subscribers (14.1% of subscribers to 6.2% of groups), suggesting a greater interest by e-group members in pornography compared with religious issues, hobbies or politics. Such pornographic sites tend to be relatively passive, generating only 2.6% of total messages, despite consuming a massive 40.7% of total e-group bandwidth due to the downloading of images. Users of such pornographic sites do not say much; they just look.

Far more significant as a measure of Indonesians’ interactive engagement with the Internet then are the vast majority of Indonesian participants who use the e-groups for social, general educational or business purposes. Illustrative of the nature and focus of such interactive

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Purbo, supra note 55, provides a preliminary analysis, while a more developed argument appears in Purbo, supra note 53. There are slight variations in the statistics provided in these two sources. Statistics cited in the following paragraphs and in Table 7 are from Purbo, supra note 53.
Internet use are the five mailing lists that Purbo identifies as carrying the highest number of messages, namely, the hobby site ‘ahli’ (57,540 messages, despite having only a modest 204 members), the political list ‘proletar’ (with 44,871 messages), the computer technology list ‘mailplus’ (37,517), the literary list ‘penyair’ (23,001) and the business list ‘export-product-indonesia’ (21,723).

One striking feature of Indonesian cyber-activity is noted by Onno Purbo in concluding his analysis of Indonesian e-groups – a feature that says much about the past and the future of the Internet project in Indonesia: it is virtually devoid of any government leadership or involvement.\textsuperscript{75} Purbo observes of mailing lists and other Internet-related activities that:

\ldots it turns out the majority of leaders are in fact not government figures, not bureaucrats. They are ordinary people, ordinary entrepreneurs in ‘real life’. They are respected because of their skills, their expertise, their wisdom in the fields in which they occupy themselves. They are different from ‘leaders’ in the real world, in government, the majority of whom are career bureaucrats who have their own mass following.\textsuperscript{76}

It is a telling judgment on the processes and infrastructure of the Internet in Indonesia that the achievements thus far have been by the community of users, with little if any reference to the government and no funding from international agencies (such as the World Bank or the International Monetary Fund). Purbo and the Internet activists whose views he personifies pose the rhetorical question, ‘So, is the government still necessary?’ The space of the Internet in Indonesia has been defined by government inaction and, to a large degree, by the absence even of large commercial infrastructural investment. Fostered by small and medium-sized companies, relying on the skills of an expanding pool of technical graduates, and guided by community-minded activist-experts, the demand for, and provision of, publicly accessible Internet has stolen a march on multinationals in Indonesia, notwithstanding the investment of companies such as M-Web and others.


\textsuperscript{76} Quotation translated from Purbo, supra note 53 [file 08c.html]. He includes in these informal national leaders of the IT community such figures as Michael Sunggiardi, Hidayat Tjokro, Mas Wigrantoro, Heru Nugroho, Yohanes Sumaryo, Andi, Gatot H.P. and Roy Suryo, and notes that local leaders include Umar Tjokroaminoto (Medan), Adi Nugroho (Makassar), Penjor (Yogyakarta), Didin (Malang) and Sanjaya Kosasih (Samarinda).
Concluding comments

What then is the place of the public on Indonesia’s Internet? Has the local warnet replaced the ‘village pump’ around which to gather and converse, or become Rheingold’s new electronic ‘social commons’ open equally for the use of all citizens? It is clear that the fundamental inequalities of computer illiteracy, poverty and lack of public infrastructure generally in Indonesia will exclude participation in the information technology revolution by the vast majority of Indonesians for the foreseeable future. However, use is increasing among more highly educated, mainly urban Indonesians living on Java or Bali, or other urban centres around the archipelago, who are both seeking to use the Internet (primarily through public access venues such as warnet) and taking the initiative to develop a public Internet infrastructure. This uptake, largely facilitated by small and medium-sized enterprises without any substantial government or international aid support, has much potential for putting pressure upon the government to deliver at least some of the benefits of access to information. The pressure for public accountability of government, assisted by the provision of ‘e-government’ (that is, government services delivered electronically) will be driven by the warnet users across the archipelago and championed by the ‘ordinary’ leaders that Onno Purbo identifies as emerging from within the broader ‘grassroots Internet community’ of Indonesia. Despite some efforts by the Indonesian government to facilitate the development and regularization of the Internet, its growth and development nationally has been driven from outside of government, by the young technically savvy educators and entrepreneurs who passionately embrace its potential for both democratic and commercial applications.

Manuel Castells has argued, not only that ‘Technology is a fundamental dimension of social change’, but that the ‘kind of technology that develops and diffuses in a given society decisively shapes its material structure’. For most Indonesians, lack of disposable income and poor IT infrastructure will combine to block their participation in the Internet, and to blunt much of its potential to shape a new democratic

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mode of communication. But the growing influence – and achievements – of techno-activists such as Purbo and others in stimulating and fostering a vibrant warnet and warintek sector, based more on small and community enterprises than on either large-scale investment or government financial support, is driving a particular type of diffusion of Internet technology through Indonesian society, a diffusion that appears to offer the prospect of Indonesia’s public successfully staking their place on the Net. Ultimately it will be Onno Purbo’s ‘grassroots movement’ and the warnet users rather than big business and the ‘bossy hand-shakers’ who will shape the primary role for the Internet in Indonesia’s emerging democracy.

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