

Indonesia Digital Review 2004

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LISENSI DOKUMEN

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In the year 2003, a significant Indonesian ICT presence is apparent especially at policy and regulatory level. The World Summit on Information Society (WSIS) in December 2003 has driven a significant impact at policy level to tune the policy and regulatory framework of the country to meet the objectives of WSIS, such as, connecting half of the country population to the Internet by 2015.

It would be a daunting task to meet WSIS objectives. Some reflected as a pressure to tune the current regulatory framework, in various shapes, e.g. Independent Regulatory Body, Liberalized Telco, Unlicensed the WiFi band, etc. Some surfaced as project proposals, such as, community telecenter for rural community, strategy for universal service obligation etc. Most of these are at ideas, concepts and discussion level. Not much large-scale implementation is being made and can be identified.

At grass root level, the people's movement is more dynamic and apparent. Most of implementations are community based, funded by community with minimal outside support including government support. Some of the most prominent movements are,

1. www.groups.or.id, it is a free mailing-list service supported by Indonesian ISPs. The community mainly funds the servers. In March 2004, it serves 2500+ mailing list with 65,000+ subscribes.
2. www.ilmukomputer.com, is a WSIS award winner that provide free ICT knowledge to the Indonesian society, funded by the society.

3. www.voipmerdeka.net, is the Rebelnet that run free VoIP service for Indonesian people, by Indonesian people. It is one of the largest free VoIP network in the world today with more than 200 gatekeepers in the network.

In addition, significant increase in ICT apparent especially in private sector, such as,

1. 40-60% increase in the URLs of Indonesian content in Indonesian language. But, fail to beat 150-200% much more increase in English URLs on Indonesia.
2. About 150% increases in the number of ICT related companies.
3. Not to mention, increase in Indonesian Internet users, bandwidth consumption, and Internet exchange traffic. Thus, the Internet service providers gain a significant benefit from all the increase.

In the next section, detailed description on various aspects in Indonesian ICT development will be reviewed. More emphasis on the development occurs in 2003.

CONTENT

In this section, content related to technology, news and current affairs, education, culture and literature, industry/business, government, civil society, health/nutrition, commerce and tourism, rural development, political groupings, agriculture, and non-government organization will be reviewed.

In evaluating the Indonesian content produced over the Web, google search is used as a major tool. Indonesian content in different topics in Indonesian language as well as in English will be evaluated. More than ten (10) commonly found word in certain context are used as keywords to analyze the number of certain topics and certain language.

A large number of URLs are found after Google search. In the following paragraphs the rank of each topics will be evaluated. The evaluation is based on the data obtained in year 2002 as well as 2003, and, thus, increase in the number of content can also be evaluated.

It is interesting to notice significantly different changes in Indonesian content in Indonesian language as compared to English.

A consistent behavior in the Indonesian content in Indonesian language is observed in 2002 and 2003. Content in technology topics is reached number one content in Indonesian language with about 2,7 million URLs about 53% increase from previous 2002 year. Follow by news and current affair with 2.5 million URLs (about 68% increase from 2002); then industry/business content with 1.9 million URLs (about 76% increase) and civil society with 1.7 million URLs (about 66% increase).

Both industry/business and civil society indicates a significant increase in their number of URLs. Industry/business used to be at rank number 5 (in 2002) and move to rank 3 (in 2003). While civil society used to be rank 7 (in 2002) and move to rank 4 (in 2003).

The rank of the rest of the content in Indonesian language is as follows, educational content with 1.6 million URLs (about 36% increase), culture/literature (1.5 million URLs / 38% increase), government (1.5 million URLs / 43% increase), health/nutrition (1.2 million/58% increase), commerce/tourism (1.2 million/76% increase), rural development (870 thousand/67% increase), political groupings (770 thousand/81% increase), agriculture (404 thousand/67% increase) and non-government organization (310 thousand/34% increase).

Similar to 2002, in 2003, the Indonesian content in English is also evaluated. Indonesian content in English aims to reach a broader English audience on the Internet. The result is very consistent between 2002 and 2003, and no change in rank of the topics. However, a significant difference apparent in the number of URLs between year 2002 and 2003. A significant increase in the range of 140%-240% in is apparent in Indonesian content in English as compared to Indonesian content in Indonesian language that reaches only 40-76%. Thus, although there is an increase in both languages, increase in English content is much higher than the local Indonesian content.

Unlike the Indonesian content in Indonesian language, the Indonesian content in English put significant emphasis in commerce and tourism as number one rank with 29 million URLs or about 205% increase from 2002. Follows by industry/business at 27 million URLs/221% increase; civil society 23,5 million URLs/205% increase; government 18.5 million URLs/209% increase; culture/literature 18.6 million URLs/233% increase; news/current affair 17.4 million URLs/224% increase; education 14.5 million URLs/188% increase; technology 14 million URLs/186% increase; political groupings 8 million URLs/139% increase; health/nutrition 8 million URLs/236% increase; rural development 6 million URLs/151% increase; non-government organizations 7 million URLs/199% increase and agriculture 5.8 million URLs/161% increase.

Thus, it is clear that the Indonesian content in English put more emphasis on commerce and tourism, industry/business, civil society, and government. It is consistent in the year 2003. Thus, the interest, the needs of Indonesian readers seem to be different than that of English readers. In both Indonesian and English content, not many content produced in rural development, non-government organizations and agriculture.

It would be of interest to see the ratio of Content in Indonesian Language relative to English. In the year 2002, the average Indonesian content in Indonesian language contributes only about 15.3% of all content on Indonesia. In 2002, the percentage of Indonesian content in Indonesian language reaches its 27.1% peak in technology related areas; followed by health/nutrition at 23.7% and news current affairs at 22%. The Indonesian techies seem to get the most benefit from the network.

In 2003, unfortunately, the ratio of Indonesian content in Indonesian language is much smaller than the Indonesian content in English. For example, in commerce and tourism the ratio is 7.1% and 4.2% for 2002 and 2003, respectively. In industry and business the ratio is 11.6% and 6.7% for 2002 and 2003, respectively. In average, in 2003, the ratio of Indonesian content in Indonesian as compared to English is about 6-10%. It is much lower than 2002. This is mainly due to significant increase in Indonesian content in English.

ONLINE SERVICES:

E-COMMERCE / E-BUSINESS

In Indonesia, having 13+ million cellular subscribers is a big advantage to run a service based on cellular features such as Short Message Services (SMS).

Business based on SMS is flourishing in Indonesia. At 5-10 cents US\$ / SMS is quite affordable for most subscribers. Having 13+ million cellular subscribers, it is quite common to see a rate of 20.000 SMS/day requesting for a service.

Thus, it is not surprising to see the provider to get around US\$30-60.000/month for their services.

PlaySMS <http://playsms.sourceforge.net> is an open source implementation of the key software to provide such service. Anton Raharja anton@ngoprek.org, an Indonesian, is the original author of the software. Using PlaySMS, a PC connected via data cable to a Nokia 6110 may run an SMS gateway service to IntraNet/InterNet based network. A decent, linux box with Apache, MySQL and some PHP scripting would be sufficient to provide the service.

DISTANCE EDUCATION & E-LEARNING

The award winning <http://www.ilmukomputer.com> as "The Continental Best Practice Examples in the Category e-Learning" received in the last World Summit on Information Society (WSIS), Geneve, 9-12 December 2004, is one of the best Indonesian distance education & e-learning site on computer knowledge. Interestingly, management strategy on how to run a free e-learning site is described in <http://ilmukomputer.com/populer/romi-elearning.php>

IlmuKomputer.COM is mostly (80%) accessed by Indonesian users. Some of webalizer data can be found at <http://ilmukomputer.com/sponsorship.php>

<http://www.ilmukomputer.com> is lead by Romi Satria Wahono (romi@romisatriawahono.net). All about ilmukomputer.com, such as, introduction, summary of activities, accomplishments, working groups etc is described at <http://ilmukomputer.com/project/romi-ilmukomputercom.php>.

More than 500 ebook, tutorials and articles are hosted at IlmuKomputer.Com. These knowledge are in various category, such as, introduction, general, polular, thesis, serial articles etc. They have not indexed all the manuscripts, but the estimate number of page is about 100,000 pages.

There are about 130 contributors as listed in <http://ilmukomputer.com/penulis.php>. The system is run by a team of 26 person in various areas as described in <http://ilmukomputer.com/pengurus.php>.

IlmuKomputer.COM is not only distributing their knowledge through the web, but also through CD media. There are about 200 people in various area in Indonesia acting as CD distributor. A complete list of these distribution channels is <http://ilmukomputer.com/distributor/index.php>

As an education portal, two ways interaction plays an important role. A total of about 3000 subscribers are listed in IlmuKomputer.COM mailing list listed in <http://ilmukomputer.com/milis.php>. In addition, IlmuKomputer.COM is collaborating with about 15 elearning communities listed in <http://ilmukomputer.com/jaringan.php>.

Web traffic is one of the major headache to managed. At the moment, there are 15 registered mirror serving IlmuKomputer.COM as listed in <http://ilmukomputer.com/mirror.php>. However, there are a significant numbers of unregistered mirror in various high schools and universities.

E-CONFERENCE / FORUM / E-COMMUNITY

It was all started in early September 2003 in Ottawa, Canada at Richard Fuchs's office at International Development Research Center (IDRC) eleventh floor. Richard Fuchs, Nancy Smyth and Onno W. Purbo were getting together and talked about the possibilities to build a more solid open source development communities in Indonesia.

Next few months, after going through many stages & phase of community based development; and funded entirely by the communities. Indonesia today has its own community based discussion platform as well as several free servers or open source development. All of these activities are self-funded by the Indonesian communities.

Groups.or.id the free mailing list discussion platform is running. As of 1 January 2004, total number of mailing list is 1541 with total unique e-mail subscriber of 34,410. To be honest, the number is too much lower than the claimed total Indonesian internet users. No one owns the project / initiative, it is an initiative of the Indonesian people.

The historical achievement can be traced back at the log book of Indonesian mailing server project at <http://www.ictwatch.com/milisproject/>. The first mailing list server is a Pentium III 600MHz. The machine is collectively donated from many people, such as, Onno W. Purbo, Irwin Day, Bona Simandjuntak, Donny B.U., David Sudjiman (Leader of KPLI Jakarta), Rio Martin (ITENAS Student), M. Ichsan (Admin Visionnet), Nies Purwati (Secretary General Mastel), Rusmanto (Editor Infolinux), I Made Wiryana (Prof at Gunadarma), Mas Wigrantoro RS (Coordinator GIPI Indonesia), Heru Nugroho (Secretary General APJII), Anton (Manager of Telematics Indonesia), KPLI Jakarta, Nona and Anonymous. On 31 October 2003, the mailing list server GOUPS.OR.ID was born!

Work is currently underway to build various other servers, such as, free webmail / popmail server, development server, as well as many other servers for open source

communities. Currently there are three (3) servers in addition to the first Pentium III mailing list server. Most of the open source developers can now be find at developer@groups.or.id.

The impact assessment of less than US\$200 contribution with lots of man hours volunteering work is performed using pflogsumm that reveal many interesting statistical fact of groups.or.id after its 2+ months of operation.

A significant amount of traffic has been generated and passed to the subscriber. After 2+ months of operation, a total traffic closed to 581Mbyte has been delivered. The server receives more than 50.000 e-mails, and delivers more than 120.000 e-mails. There are 319 sending hosts / domains with more than 31.000 receiptents, and more than 3500 recipient hosts / domains.

Evaluating the recipient host/domain, it is clear that yahoo.com is still number one (1) e-mail recipient with average daily receive about 1Mbyte of e-mail. CBN.net.id is number two in rank with about 200Kbyte of traffic, followed by plasa.com , telkom.net, hotmail.com with about 160Kbyte of traffic. It seems many users who like to read / listen to discussion will likely to use free mail service.

A bit different from the recipient, the sender of mail to the mailing list server is still dominated by yahoo.com. However, the following hosts are CBN, telkom.net, IndoNet and IndosatNet. It seems quite a bit of the mailing list poster will like to pay for a more reliable e-mail service from the provider.

The most active mailing list at groups.or.id. genetika@groups.or.id is known to be the mailing list where most Indonesian ICT activists meet & have a discussion. One of the most interesting phenomenon is kebumen@groups.or.id, Kebumen is a small city in mid Java island. It is amazing to see communities in such remote area get together on the Internet. The migrants originated from Kebumen in various cities initiate such discussion group.

ICT INDUSTRIES AND SERVICES:

Quite significant & consistent ICT industrial data can be found in the Indonesian Chamber of Commerce site (www.kadin.net.id/businessnet/) and the Indonesian Yellow Pages (www.yellowpages.co.id).

In 2003, a total of 1608 Indonesian ICT companies can be easily searched through the Indonesian Yellowpages www.yellowpages.co.id. It is a significant (148%) increase from 2002 with only 649 ICT companies.

Let us compare the focused area of the companies between 2002 and 2003. The highest increase is apparent in web design related companies of 850% with 2 companies in 2002 becomes 19 in 2003; and information technology related companies of 571% increase, with 24 companies in 2002 into 161 companies in 2003.

The majority of Indonesian ICT companies are growing around computer software with 362% increase (68 in 2002, to 314 in 2003); internet services with 169% increase (133 in 2002, to 358 in 2003); computer programming consultants with 163% increase (52 in 2002, to 137 in 2003); internet provider with 93% increase (90 in 2002, to 174 in 2003); computer total solution with 167% increase (27 in 2002, to 72 in 2003); computer internet companies with 51% increase (59 in 2002, to 89 in 2003); and software related companies with 68% increase (88 in 2002, to 148 in 2003).

It is shown clearly that demand in Internet related business is quite high as reflected in the large increase in companies offering Internet services. Computer consultants, programming, software, as well as providing total solutions are also maturing to meet the demand.

It is interesting to note that companies listed to provide e-commerce services are diminishing. It is a logical consequence of an untrustworthy business conduct by many

Indonesian lamer. Stolen credit card used to buy goods over the Internet. It is a shame, the Indonesian police force as well as many communities is working on it.

The number of ICT companies are increasing by 148% from 649 in 2002 to 1608 in 2003. The Indonesian ICT companies are distributed unevenly. Most of them are located in Jakarta with 1114 companies (139% increase from 2002), followed by Surabaya with 143 companies (472% increase from 2002) and Bandung with 120 companies (60% increase from 2002). Only few companies spread outside Jawa Island, namely, Medan (43), Bali (32), Palembang (4) and Makassar (6).

A significant increase (443% from 2002) with a total of 76 companies is apparent in Yogyakarta. It is interesting to note that The Yogyakarta Sultan has declared to develop their area as cyber area. Note that Yogyakarta is also known as city of students with many universities and colleges, such quality of human resources is needed to back up a significant increase in IT business activities.

INDONESIA INTERNET INFRASTRUCTURE

The easiest way to probe the Indonesian Internet infrastructure development is through monitoring the expansion of Indonesian Internet Service Provide (ISP). Commercial ISP was started by IndoInternet, which is known as IndoNet <http://www.indo.net.id> in 1994.

Most of the commercial Indonesian Internet infrastructure can be investigated through the Indonesian Internet Service Provider Association also known as Asosiasi Penyelenggara Jasa Internet Indonesia (APJII) <http://www.apjii.or.id>. As of 3rd quarter 2003, there are 124 Members of APJII. 93 ISP are holding its operational license. Only 73 ISP are connected to the IIX. There ISP provides service in 90+ cities, all provinces as listed <http://www.apjii.or.id/layanan/lokasi.php?lang=ind>

APJII provide common facilities, such as,

- APJII Indonesia Internet Exchange (IIX)

- APJII IDNIC
- Domain Registration & NIR (APNIC)

Not all APJII members require services, such as, IP address allocation and interconnection to the Indonesian Internet Exchange (IIX).

In reality, various form of Internet cafes or neighborhood network serve 60-70% Indonesian Internet users. It is interesting to note that all of these activities are privately driven and not publicly driven.

The estimated Indonesian Internet users and subscribers up to the end of 2003, can be downloaded from the annual report of the Indonesian ISP Association (APJII) at <http://www.apjii.or.id/dokumentasi/statistik.php?lang=eng>. In general, the total Internet subscribers to Indonesian Internet Service Providers is about 10-20% of the Internet users. We see an average of 50% yearly additional increase of both Internet subscribers and Internet users. In 2003, the estimated Indonesian Internet subscriber is about 800.000 subscribers with about 7.5 million Internet users. A significant increase to 2002 condition with about 670.000 Internet subscriber and 4.5 million Internet users.

More detail study on its profile can be found in the research done by APJII. It is common to see a majority of male, young (25-35 years old) and educated people (high school graduate, university students or young professionals) would compose the majority of the Indonesian Internet users.

Although, Indonesian would prefer to use international domain naming, such as, .com and .org, due to its flexibility and easiness in getting the name. A growth in new domain registered in the Indonesian top-level domain ID-TLD is apparent. An additional more than 3700 new domain from 2002 to reach more than 18200 total domain in 2003 has been reported. The additional new domain in 2003 is a little bit higher than the additional 3200 in 2002.

In the year 2001, there was a decreased in new domain. Budi Rahardjo, the ID-TLD, argues that the reduction is mainly due to global dotcom failure worldwide. Budi is not commenting on the use of .com or .org on Indonesian sites.

The allocated IP address and AS number in Indonesia is growing steadily. A total of 2377 Ipv4 blocks with 69 AS number has been allocated for Indonesian ISPs in 2003. A important change is in the allocation of 131,073 Ipv6 accumulative blocks in 2003. There was no Ipv6 previously allocated. The allocated Ipv6 blocks enables the Indonesian to start play with Ipv6 network. The working group is located at ipv6@apjii.or.id.

To reduce the international Internet traffic, APJII sets several Indonesia Internet Exchanges (IIX) in Jakarta, e.g., in Cyber Building in Mampang, Jakarta, in Kuningan, Jakarta and in Telkom Building, Jalan Gatot Subroto, Jakarta. The one at Telkom Building will likely to cease operation, as Telkom will terminate their lease. These IIX are interconnecting with each other. The IIX serves the connection of all ISPs in Jakarta at zero interconnection charges. The same principle is currently being pursued in various cities in Indonesia, such as, Surabaya, Bandung and Jogjakarta. It is needed, as most of intra-city traffic is now routed through Jakarta.

From MRTG (*Multi Router Traffic Graph*) reports administered by Johan Alam (johar@the.net.id) the IIX administrator; we will find a significant number of increase in peak bandwidth through the IIX.

By analyzing the above traffic one may find that the traffic increased is mainly due to increase in corporate subscribers. In addition to it, Indonesian Internet users find more interesting Internet applications that require high bandwidth, such as, transferring MP3 files, multimedia, and online gaming over the network.

As reported by Johar Alam (johar@the.net.id) the administrator of Indonesian Internet Exchange (admin@iix.net.id) and Heru Nugroho (hn@apjii.or.id), in early January 2004, the total IIX in country peak bandwidth is in access of 1.2Gbps. It is about doubled the

peak traffic in March 2003 at 620Mbps. Since the international traffic is normally about three (3) times of local bandwidth, the peak Indonesian international bandwidth is estimated about 3Gbps. The peak bandwidth is normally about 70-80% of the maximum bandwidth. Thus, it is safe to estimate a maximum bandwidth of 2Gbps from Indonesia to the Internet. The ratio of in-coming and out-going Internet traffic volume is about 1:10 as Indonesian is still consume more information rather than produce information.

As reported by APJII, the table shows clearly that the government grants large number of ISP licenses. Thus, it seems no restriction is applied and only the professional would be able to show its capacity to operate an ISP and receive the operational license. By 3rd quarter of 2003 the government has provided license to more than 190 Internet Service Provider (ISP), 29 Network Access Provider (NAP) and 24 Multimedia Provider. An increase from 180 ISP, 18 NAP and 24 Multimedia provider in 2002. It is interesting to note that it was all started with only two (2) licensed ISP in 1994.

Of the above licensed companies, some may apply for membership at the Indonesian ISP Association APJII www.apjii.or.id. There are about 125 member of APJII as of the 3rd quarter of 2003.

Not all licensed companies will joined the Indonesian ISP Association (APJII). APJII member is growing from 41 members in 1999 up to around 124 in 2003. It comprises of 111 Internet Service Provider (ISP), 6 Network Access Provider (NAP), 4 Multimedia Provider and 3 other provider that not within the other category, such as, research and education network provider etc.

EXAMPLES OF INNOVATIVE AND KEY INITIATIVES:

INDONESIAN VOIP MAVERICKNET

Virtually declared in cyberspace at genetika@yahogroups.com, Sunday, 12 January 2003 10:19:39 GMT+0700, the Indonesian VoIP Maverick Network also known as VoIP Merdeka in Indonesian language officially run.

VoIP MaverickNet is the result of reaction of Government plan to increase the phone tariff per first january 2003.

VoIP MaverickNet is a community based VoIP Network run on top the Indonesian Internet Infrastructure. It is a free VoIP network & one of the most complex countrywide Internet Telephony infrastructures ever implemented.

An open source gatekeeper (www.gnugk.org) is used as the main gatekeeper software. The VoIP MaverickNet archirecture is based on a VoIP gatekeeper cloud that acts as the main VoIP switch.

The VoIP softswitch structure is quite complicated tree structure with more than 200 public gatekeepers. The list of the gatekeepers can be found at <http://voipmerdeka.net/gkregistration/>.

RootGK – it normally runs as the highest-level gatekeeper in the infrastructure. In the Indonesian Internet Telephony MaverickNet, it is located at the Indonesian Internet Exchange (IIX).

The second level gatekeeper is a stand-alone gatekeeper in the Internet to be used by public. It is basically a public gatekeeper; some calls it an Operator Gatekeeper (OGK).

The third level gatekeeper is the gatekeeper located at the Proxy Server. It is basically a proxy gatekeeper; some calls it Local Gatekeeper (LGK).

Please note how the numbering is set. An endpoint (EP) with a number of 62888881234567 must register to a public gatekeeper that handles prefix 628888. If the EP 62888881234567 registers to other public gatekeeper, other EP will not be able to call EP 62888881234567.

At the moment this manuscript is written, there are a couple public major gatekeepers serving the Indonesian Free Internet Telephony MaverickNet, namely,

Two (2) machines act as the RootGK located at 202.155.39.157 and 202.53.224.172. A couple more gatekeepers acting as the public gatekeeper serving a specific prefix, such as,

- 202.155.39.157 - for area code 62 88 (Root Gatekeeper).
- 218.100.4.194 - for area code 62 88 888
- 202.43.162.189 - for area code 62 88 999
- 202.150.8.15 - for area code 62 88 925

Some of friends in Indonesian Free Internet Telephony MaverickNet are donating their gatekeeper for public usage. Some of them can be reviewed at <http://gk.vision.net.id> and <http://voipmerdeka.net/gkregistration/>. A total of 147 Regional / Operator Gatekeeper can be found.

There are unknown numbers of gatekeeper running at many proxy servers. Typical daily traffic is about 2000+ calls per day. Serving thousand of users. It is interesting to note that some users may have call duration in several days.

Effort is currently underway to integrate the network into other international gatekeeper network. The integration is done through gatekeeper Neighbors settings. There are several active gatekeeper neighbors, such as, Singapore, Japan, England, Germany, Canada and Sudan. Note that these neighbors are not the formal Telco gatekeepers. The volunteers in these countries run it.

Community education is the basic strategy in building such free & low cost VoIP network.. Mailing list is used as the main vehicle to do the education processes at voipmerdeka@yahoogroups.com and gk-admin@yahoogroups.com.

ENABLING POLICIES

At the time this manuscript is written, a fierce fighting is currently underway over several mailing lists on the Internet, such as, indowli@yahoogroups.com, genetika@groups.or.id, asosiasi-warnet@yahoogroups.com, telematika@yahoogroups.com, mastel-anggota@yahoogroups.com, between many individuals from the Indonesian grass root communities and individuals from the telecommunication regulators.

The fight is on liberating WiFi from any requirement of government licenses. In October 2003, a draft on ministry of telecommunication decree on WiFi is being written. Many people from the communities fight for freedom, while some people on the telecommunication regulator insisted to license the band.

Would it be fair to charge US\$250 per year per Access Point for frequency usage, while the price of an Access Point is only US\$100-150 each? Unfortunately, the government limits the license to operate the equipment only for ISP. Those who run the system without any license will be revoked. Such approach is claimed to bridge the digital divide and increasing the Internet penetration in Indonesia.

As knowledge on WiFi deployment can be freely downloaded from the Internet at <http://sandbox.bellanet.org/~onno/> and <http://www.apjii.or.id/onno/>. It is getting more difficult for the government to fight its own people as more people can build, install and run the system. As of end 2003, there is 5000+ outdoor WiFi installations, at 200-300 new additional installations per month, The government will have to face a large mass of people to fight with.

It is a shame some the telecommunication regulator does not realize the impact of liberating 2.4GHz & 5 GHz WiFi band. An underestimate calculation reviles that there will be an increase from currently,

1. One (1) million to 17.8 million WiFi based Internet users.

2. Rp. 1 Billion/year to Rp. 21 Billion/year ISP tax.
3. Rp. 7 Billion/year to Rp. 128 Billion/year VAT.
4. Rp. 18 Billion to Rp. 600 Billion investment tax.
5. 50.000 units to 2 million unit computers.
6. 5.5000 units to 130.000 units ISM band equipment.
7. Such increase in ISM band equipment needs will justify an industrial migration from antenna and tower manufacturing to ISM band equipment manufacturing at US\$4.5 million value.

Not to mention spin off effect on many economical benefit to the country.

There are many version of WiFi band liberation scheme; the one that proposed by Onno W. Purbo (and supported by many individual in the community) to the ministry of telecommunication is as follows,

1. Liberate ISM & UNII (2.4 GHz, 5.2GHz & 5.8GHz) band
2. No license and registration requirement for ISM & UNII band users.
3. No type approval requirement for equipment approved by FCC and ETSI.
4. Limit the maximum Effective Isotropic Radiated Power (EIRP) to 30-36 dBm. Those who violate the limit may be prosecuted under Telecommunication Act No. 36/1999.
5. The community coordinates frequency sharing and reuse coordination for Metropolitan Area Network (MAN).