



The Connected Archipelago

The role of the Internet in Indonesia's economic development

December 2011

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Glossary

ADB	Asian Development Bank
ATM	Automated teller machine
BCG	The Boston Consulting Group
BMI	Business Monitor International
BRICI	Brazil, Russia, India, China and Indonesia
B2B	Business to business
B2C	Business to consumer
DAE	Deloitte Access Economics
FTC	Fibre to the curb
GDP	Gross domestic product
ICT	Information and communication technology
IMF	International Monetary Fund
ITU	International Telecommunication Union
LNG	Liquid natural gas
MCIT	Ministry of Communications and Information Technology
MGI	McKinsey Global Institute
OECD	Organisation for Economic Cooperation and Development
PC	Personal computer
SME	Small- or medium-sized enterprise
SMS	Short message service
UN	United Nations
2G	Second generation wireless telephone technology
3G	Third generation wireless telephone technology

Executive summary

The Internet is beginning to transform the way much of the Indonesian economy and society operate

While the level of Internet penetration is low in Indonesia, at 9.1% of the population in 2010, compared to some of its neighbours in the region (China 34.3%, Malaysia 55.3% and Vietnam 27.6% (ITU 2011), Internet growth in Indonesia has started to accelerate sharply. Measures of the expansion of the Internet in Indonesia have doubled since 2008, according to indices developed for this report.

Usage varies considerably across Indonesia, reflecting differences in affordability, market size and the state of infrastructure. It is highest in Jakarta, followed by the other large urban centres on Java, Sumatra, Kalimantan and Sulawesi. Capability is more rudimentary in rural areas with greater reliance on satellites and warnets – the Indonesian equivalent of Internet cafes.

Today, the Internet accounts for 1.6% of Indonesia's gross domestic product (GDP). It is forecast to grow at a rate three times that of the overall economy over the next five years and is expected to account for at least 2.5% of GDP by 2016.

- At around 1.6% of Indonesian GDP, the contribution of the Internet is above the value of liquid natural gas exports (1.4%) and three times the contribution of the electricity sector (0.5%)
- Other studies, e.g. by Boston Consulting Group (BCG) and McKinsey Global Institute (MGI) suggest the size of the Internet in the Indonesia economy is similar to that in Brazil (1.5%) and Russia (1.6%), but less than in some Asian countries such as China (2.6%) and India (3.2%) and Hong Kong (5.9%).

To date, the rapid uptake of social networking has driven much of the growth of the Internet in Indonesia. The affordability of mobile phones, as the cost of both phones and service plans drop, has accelerated social network growth. Many in social networks have been using mobile phones or very basic smart phones over 2G networks. However, as prices of handsets and bandwidth have declined, especially over the past year, smart phones using 3G networks have become more affordable and their take-up has accelerated. The additional functionality that comes with the higher bandwidth and more sophisticated devices will see the use of search engines and a variety of applications become widely used, thereby deepening the benefits that the Internet will bring to the Indonesian economy and society.

Over the coming years change will also be driven by users becoming progressively more familiar with the broader array of content available on the Internet. Creating local language content will be a key driver to realising the potential of the Internet in Indonesia and in narrowing the gap in living standards with more developed economies.

Some sectors of the Indonesian economy are already recognising the potential of the more sophisticated roles that the Internet can play:

- Indonesian SMEs are starting to use the Internet to expand their customer base, increase sales and improve supply
- Consumers are paying utility bills via electronic payment systems such as *Finnnet*, transferring funds using automated teller machines (ATMs), and accessing other online services provided by banks. Although online banking still has a relatively small reach in Indonesia, comScore estimates the number of users almost doubled in 2010

- Consumers are conducting online purchases from e-commerce sites such as *Plasa.com*, a retail portal
- Government is investing in providing backbone infrastructure – the *Palapa Ring* – with a long-term goal of joining major centres in the west, laying maritime cables to islands to the east and passing more households and businesses with fibre to the curb (FTC).

Looking ahead, there are a range of drivers that will influence how the Internet will evolve. The starting point in Indonesia is different from that in advanced economies because Indonesia is predominantly a mobile, social network driven platform whereas SMEs and regional areas have relatively low levels of e-readiness.

The evolution of the Internet will be multi-faceted and dependent on:

- Education about the Internet, through Internet in schools and perhaps a PC or tablet at home, and the benefits of features such as search
- Larger businesses and government leading the way
- Mobile phones driving more regular but more basic uses, and expanding rapidly
 - Advertising is used to subsidise fixed broadband, but it is not clear how readily this will translate to the dominant Internet medium.

The increase in the Internet's contribution to the Indonesian economy from 1.6% of GDP to at least 2.5% of GDP over the next five years is expected to reflect:

- The ease of gains through more closely matching the use of the Internet in other Asian nations
 - For example, in China, at a comparable stage, Internet use tripled between 2006 and 2010, from 10.5% of the population (aged six and over) to 34.3% (ITU 2011).
- The sharp improvements in affordability of relevant devices
 - For example, prices of locally made entry-level smart phones in mid-2011 were 75% lower than a year earlier.
- Recent trends in key indicators of access, use and expenditure
 - Key indicators have doubled since 2008, accelerating in the last two years.
- The underlying health of the Indonesian economy
 - The International Monetary Fund (IMF) predicts GDP growth rates of between 6% and 7% per year out to 2016.

Notwithstanding the obstacles to the spread of the Internet in the form of capacity constraints and affordability that will take time to overcome, Indonesia is well placed to enter a more sophisticated path of Internet growth. This development, through more powerful uses based on search, content creation and video, will impact the economy and society more broadly.

Deloitte Access Economics

1 Indonesia's economy and the Internet

The Internet is transforming Indonesia. It is now present, to some degree, in most aspects of Indonesian commerce and society. Yet, it is difficult to define this presence. There are not clear definitions of the 'Internet economy' or those parts of an economy that exist because of the Internet.

For the purpose of this study of the Internet in Indonesia, the Internet is broadly defined as those activities and segments of the economy whose existence is commonly associated with the networking and information sharing capability provided by the Internet. For example, traditional one-to-one voice and text telephony would fall outside this definition of the Internet, but social networking media would be included

1.1 A far flung Archipelago

Indonesia comprises more than 17,000 islands across a land area of 1.9 million km² and a sea area of 7.9 million km². The vast majority of the population lives on the five islands of Java, Sumatra, Sulawesi, Kalimantan and Papua. Some 53% of the population live in urban areas and the most populous cities are Jakarta (9.1 million), Surabaya (2.5 million), Bandung (2.4 million), Medan (2.1 million) and Semarang (1.3 million) (BMI 2011, CIA 2009). This polyglot nation of 240 million includes around 520 ethnic groups and 742 local languages (Moedjiono 2009).

As is common in developing countries, there are large differences in living standards across Indonesia. The majority of economic activity is generated on the island of Java and Jakarta is clearly the largest and wealthiest market.

Against this backdrop is an economy with significant potential. Factors such as the country's large and youthful population and rich natural resources are central to the Indonesian economy's future.

Indonesia is growing rapidly; GDP growth was 6.1% in 2010 and the economy is forecast to grow by 6% to 7% annually through to 2016 (IMF 2011).

However, there are challenges to realising Indonesia's growth potential. Geographically separate regions with dominant provincial governments pose a challenge to consistency and coordination throughout the country. The success of national government policies aimed at unifying the country and addressing uneven economic development will help determine what the future holds for Indonesia.

1.2 The Internet in Indonesia

The level of Internet penetration across Indonesia differs widely, reflecting variations in access costs and infrastructure. Relatively few Indonesian households have PCs or fixed telephone lines. The majority of the islands are not connected to fibre technology and the connections that are available do not support high traffic volume. As a result, the Internet has a relatively low level of penetration and is localised to certain regions in Indonesia.

Mobile telephony and text are inexpensive and within reach for most Indonesians. In 2010, there were 220 million mobile phones in use, or 92 mobile phones per 100 inhabitants (ITU 2011). Adjusting for owners of multiple handsets, this indicates that as many as 85% of the adult population or 65% of the total population have access to a mobile phone.

By comparison, in Indonesia fixed Internet bandwidth is expensive and Internet penetration was estimated by the ITU to be a relatively low 9% in 2010 (ITU 2011). Comparable figures for Indonesia's neighbours in the region are: China 34.3%, Malaysia 55.3% and Vietnam 27.6%.

However, other sources indicate that penetration has risen rapidly since the ITU estimates were made. For example, the Ministry of Communications and Informatics (Depkominfo) estimated that there were 45 million internet users in mid 2011, which is equivalent to around 18% of Indonesia's population, while Business Monitor International estimated that combined narrowband and broadband Internet penetration was even higher at 26% in 2010 (BMI 2011).

As discussed in Figure 1.1, the 'warnet' or Internet cafe has traditionally been the main channel for accessing the Internet for many Indonesians. However, these are being replaced to varying degrees by mobile handsets and PCs in the home in urban areas. Commercial or business usage is less prolific and concentrated in government and large businesses. There is a large gap between Internet use by large business and SMEs.

Indonesians primarily use the Internet for social networking purposes, ranking second highest for the number of Facebook accounts (40 million in mid-2011) and third highest for the number of Twitter accounts worldwide. Although social networking often results in content exchange rather than content creation, over time, there is the potential that increased access to the Internet through the next wave of smart phones will lead to more sophisticated content being created. As the prices of computers and smart phones continue to decline, Indonesians' use of the Internet will shift to more powerful uses based on search and video.

1.3 Approach to assessing the Internet economy

The approach adopted in this report is to explore different dimensions of how the Internet is evolving and transforming the economy and society in Indonesia. This involves estimating the share of Indonesia's economic output that can be directly attributed to the Internet.

Taking the analysis further, to understand how the Internet is transforming households, business and government, requires identifying differences between and within these sectors. Indices that track how the Internet has been spreading and expectations of how SMEs will embrace the Internet in the future are also introduced in this report.

Although each aspect of the analysis is subject to qualifications related to the quality of the data used, together they give a sense of the innovation, vigour and participation that the Internet is bringing to Indonesia.

Figure 1.1: Connected community – the *warnet*

The Internet cafe or *warnet* has traditionally been the most popular way for Indonesians to access the Internet. As both the cost of purchasing a computer and establishing a personal Internet connection have been out of reach for most Indonesian families, the warnet has offered Indonesians with a cheaper alternative to Internet access. There are around 260,000 warnets across Indonesia.

An additional element for its popularity relates to its cultural and social significance. The term 'warnet' is short for 'warung internet', where a 'warung' is a traditional small meeting place where people shop, eat and exchange news.

The warnet provides a mechanism for social engagement through the physical space of meeting with people but also through chat rooms which are the most common online activity in the warnet.

Despite its historical success throughout Indonesia, users particularly in urban areas have, to varying degrees, begun to rely on mobile and broadband devices to access the Internet. Nevertheless, warnets continue to play an important role in providing Internet connections to users throughout Indonesia.



2

The Internet's imprint on the Indonesian economy

4.51% Oil and gas

0.43% Wood and
related export

2.90% Fertilizers, chemical
and rubber products industries

2.08% Textiles, leather products and footwear

1.6%
Internet
economy

0.43% Wood and other products manufactured

0.24% Tin and related export

1.51% Electrical, electronic equipment export

1.45% Liquefied natural gas

2 The Internet's imprint on the Indonesian economy

The Internet is a relatively recent communication medium in Indonesia. While Internet penetration at home is low, Internet enabled mobile phones and warnets have allowed Indonesians to access the Internet at a relatively low cost. Indeed, the number of Internet users in Indonesia outnumbers the reported number of fixed-line broadband subscribers to Internet services by a factor of ten (ITU 2011).

This chapter estimates the share of Indonesia's output that can be directly attributed to the building and maintenance of infrastructure necessary to support access to the Internet, its use and the development, and distribution of content.

Data measuring Internet-related activities in Indonesia can vary markedly across different sources. This report uses ITU data, where available, because they provide consistency over time and across countries. However, data for some of the ITU measures are dated and more recent sources suggest that Internet use has increased more rapidly in the past six to 12 months than implied by the ITU estimates. Consequently, where ITU estimates are used as the basis of calculations, these figures will tend to underestimate the impact of the Internet on Indonesia

2.1 Economic contribution studies

There is no definitive approach for measuring the contribution of the Internet to GDP. In theory, there are three sets of measures that can be used to construct GDP:

- The value of *production* of goods and services, net of the costs of goods and services inputs
- The *expenditure* on final goods and services produced
- The *income* earned by companies and individuals from this production.

Conceptually, each approach should deliver identical results as they are simply measuring the value-added output from different perspectives. They are accurate for segments of the economy where there are well defined markets and where the labour and capital inputs can be clearly identified.

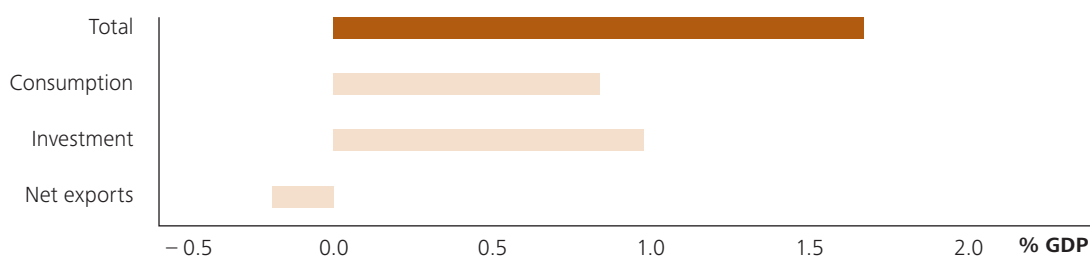
In practice, the paucity of available data measuring the different aspects of the Internet economy places limitations on each of these methods. The approach taken in this report is to calculate the Internet's contribution to GDP using the expenditure approach.

2.2 Direct contribution to the Indonesian economy

The direct contribution of the Internet to the Indonesia economy is estimated to be around 1.6% of GDP or Rp 116 trillion (US \$13.3 billion)

The expenditure approach measures the amount spent by consumers, businesses, government and overseas residents on Internet related goods and services that are produced in Indonesia (further details about the methodology are provided in Appendix A). Using this definition, adopted in similar economic contribution studies for other economies, the direct economic contribution of the Internet in Indonesia is estimated to be 1.6% of GDP in 2011 (Chart 2.1).

Chart 2.1: The size of the internet economy: the expenditure approach



Source: Deloitte Access Economics

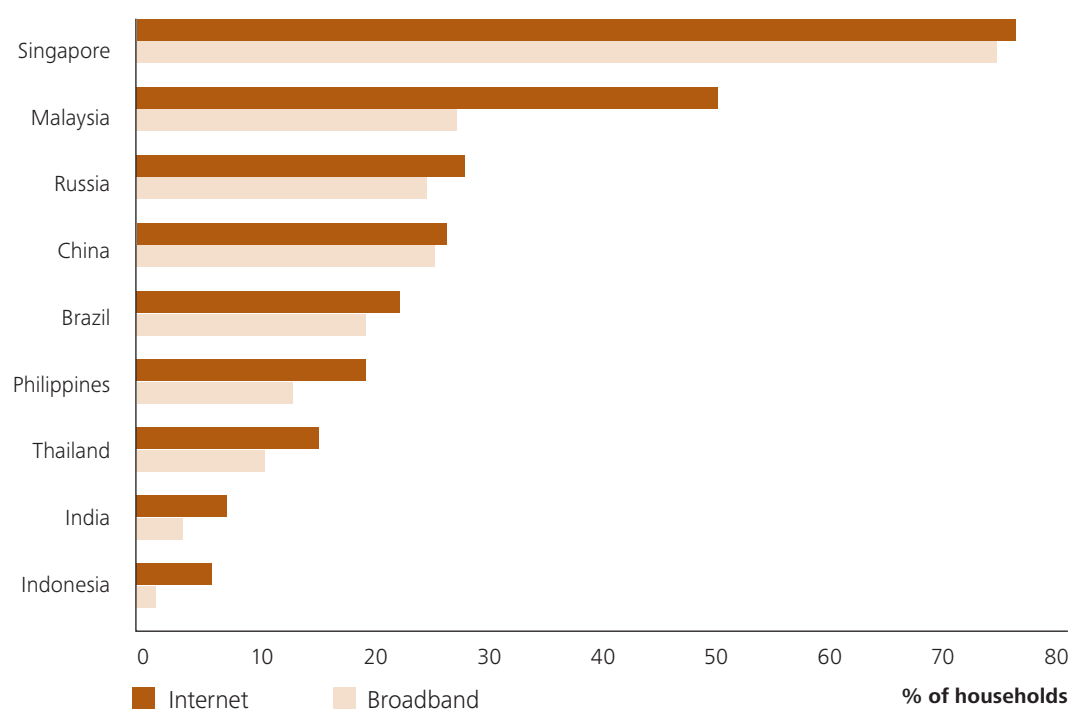
2.2.1 Household consumption

Household consumption of Internet-related goods and services is estimated to be around 0.8% of GDP. This comprises spending by households on devices to access the Internet (including computers and mobile devices) and spending on data accessed, as well as the value of goods and services bought over the Internet from Indonesian-based vendors.

The number of Internet subscriptions in Indonesia has surged from a very low base in recent years to around 7% of households in 2010 (Gartner 2011). This rate is low compared to other BRICs and neighbouring East Asian countries (Chart 2.2). PT Telekomunikasi Indonesia (PT Telkom), the largest Internet provider, had 5.5 million broadband subscribers (fixed and mobile) in 2010 (BMI 2011).

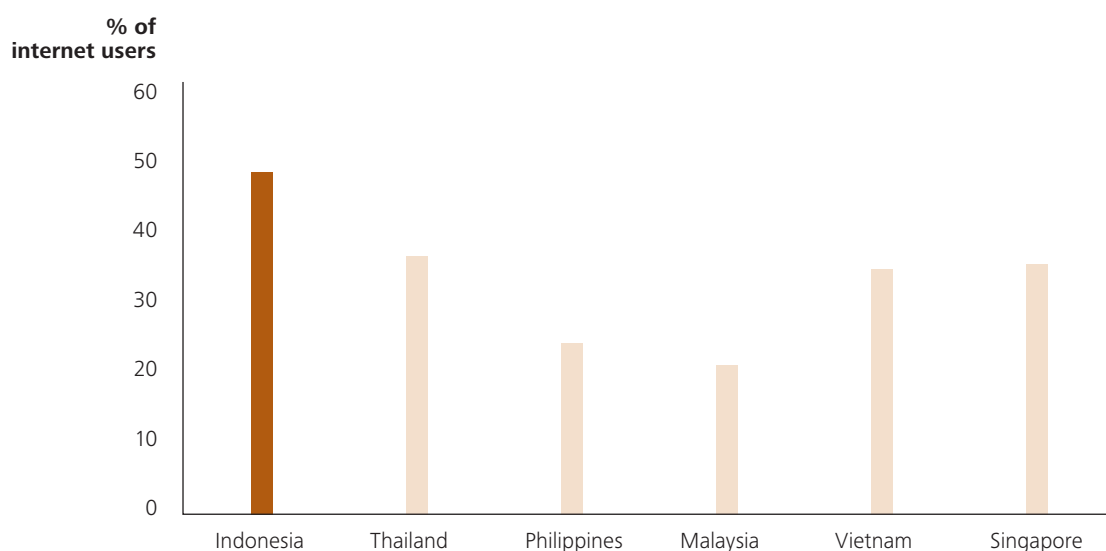
However, there are many more Internet users in Indonesia who do not have a fixed line subscription, reflecting the popularity of mobile Internet and warnets. Indeed, according to a survey completed by The Nielsen Company in 2011, the proportion of Internet users who access the Internet via their mobile phones is higher in Indonesia (48%) than in other East Asian countries, such as Malaysia (21%) and Thailand (36%) and, surprisingly, Singapore (Chart 2.3).

Chart 2.2: Share of households with internet accounts, 2010



Source: Gartner Inc. 2011

Chart 2.3: Share of users who access the Internet daily, by mobile phone



Source: Nielsen 2011

Consistent with these statistics, the bulk of spending on access to the Internet in Indonesia is associated with mobile Internet (around 70%) and the remainder is for fixed line access. E-commerce is still in its infancy in Indonesia, with online spending estimated to be only worth around US\$230 million per year in 2010, or less than 0.1% of GDP (DAE).

2.2.2 Business and government investment

Spending by business and government on ICT represents a further 1.0% of GDP. Telecommunications investment accounts for around half of this, as business and government work towards building Internet infrastructure.

Backbone infrastructure currently passes four million households, and investment expenditure will continue to ramp up as the government works towards its target of providing access to 15 million households (20% of total households) by 2015 (DAE, personal communication).

Government spending on computer hardware has been relatively small compared to other countries in the region, but the government target to purchase 2.5 million computers for schools should boost government Internet-related investment (BMI 2011).

The remainder of business and government investment represents business and government spending on computers and software to access the Internet.

2.2.3 Net exports

Some spending by households, businesses and governments is on goods and services that are produced overseas, while foreigners buy some goods and services produced in Indonesia. Overall, reflective of the broader economy, Indonesia is a net importer of e-commerce and ICT equipment, which together subtract around 0.2 percentage points from GDP.

2.3 Benchmarking the Internet in Indonesia

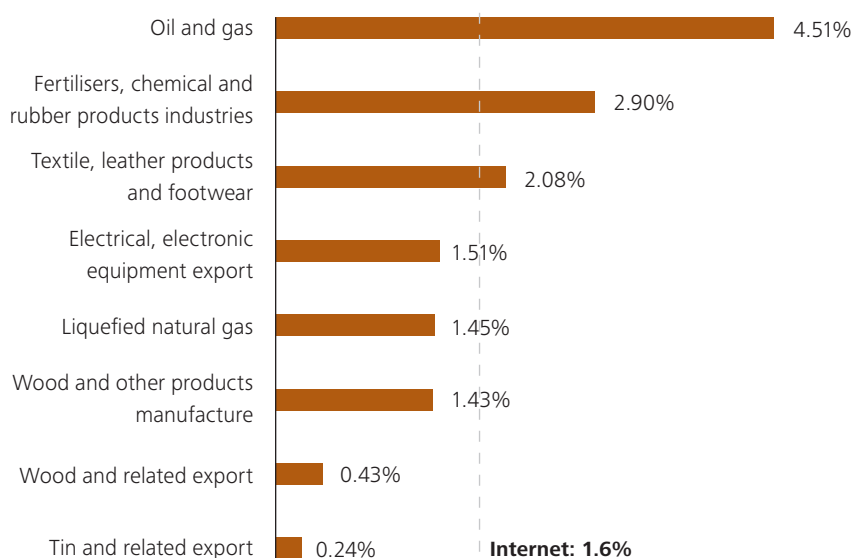
The Internet's presence in Indonesia is uneven, concentrated in some industries and regions but patchy in many others. The use of the Internet and the related contribution to the economy is generally lower than in comparable countries.

2.3.1 Domestic sectors

At around 1.6% of GDP, the value of the Internet is around one-third the value of production from Indonesia's oil and gas mining sector, which was 4.5% of GDP in 2009. This compares with a 2.1% contribution from textiles, leather products and footwear industries and 2.9% from fertilisers, chemical and rubber products industries.

Nonetheless, the value of the Internet's contribution to Indonesia's economy is already above the value of electronic equipment exports (1.5%) and the value of liquefied natural gas manufacturing, and the manufacturing of wood and other products; these established industries each accounted for 1.4% of GDP in 2009. The Internet's contribution is also estimated to be three times the value of wood exports and seven times that of tin exports (Chart 2.4).

Chart 2.4 Value of sector, relative to GDP



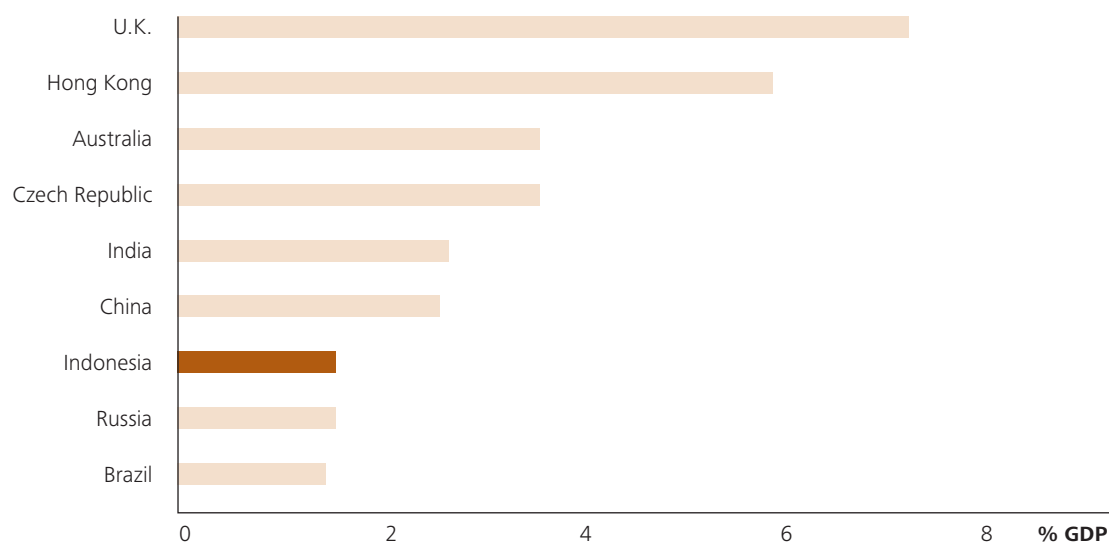
Source: Statistics Indonesia, Deloitte Access Economics estimates

2.3.2 International comparisons

The size of the Internet in Indonesia is similar to that in Russia and Brazil but less than in China and India, and in some Asian regions, such as Hong Kong (Chart 2.5):

- The Boston Consulting Group, based on a similar methodology to that used in this report, estimated the contribution of the Internet to the Russian economy at 1.6% and to the economy of Hong Kong at 5.9% (BCG 2011a)
- McKinsey, in a 2011 study using a slightly different methodology, estimated the size of the Internet economy in Indonesia to be similar to that of Brazil, but smaller than in China and India, where it contributes 2.6% and 3.2% to GDP, respectively.

Chart 2.5: Economic contribution of the Internet, 2009*



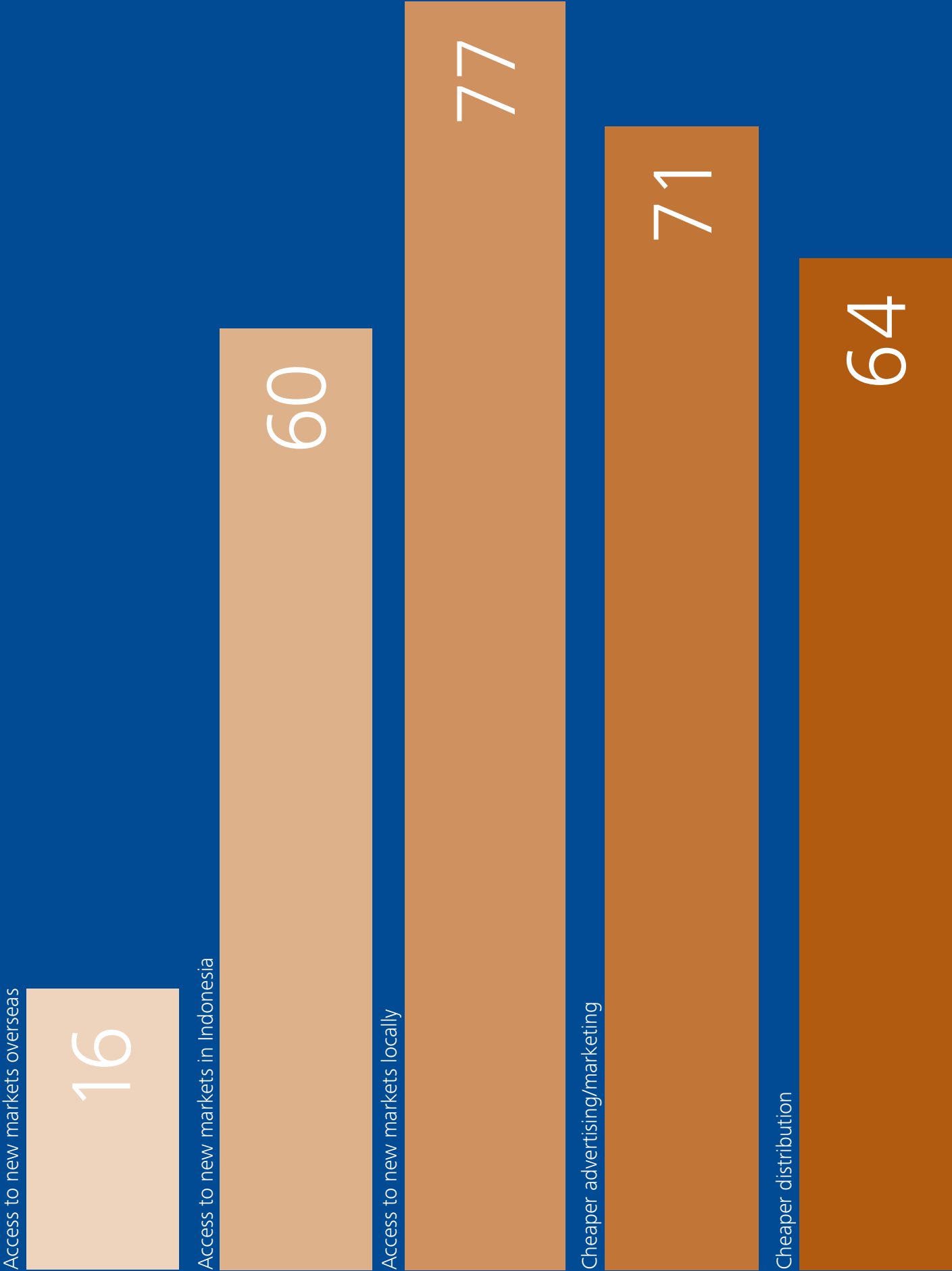
* All data refers to 2009 except for Indonesia and Australia, which are 2010 and 2011 respectively
Source: Boston Consulting Group, McKinsey and Deloitte Access Economics

3

How the internet is transforming the Indonesian economy

Benefits the internet provides in relation to sales, marketing and advertising

% of businesses using the internet



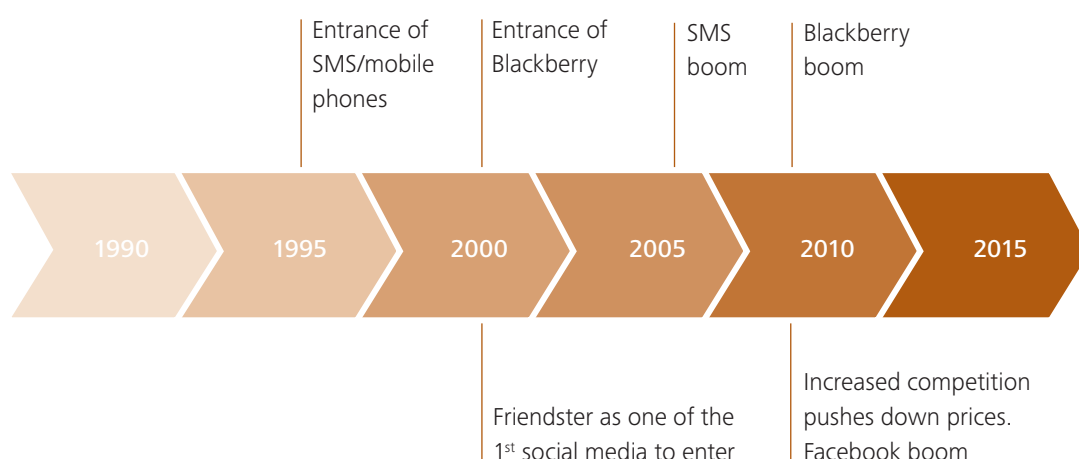
3 How the internet is transforming the economy

This chapter discusses how the Internet is beginning to transform the Indonesian economy, touching on many of the unique challenges being faced and its role in aiding *Bhinneka Tunggal Ika* (national motto: many, yet one). The analysis is in three parts; focusing on households, business and government.

3.1 Internet chronology

The growth of the Internet in Indonesia has been driven by the sharp falls in mobile phone prices allowing widespread use of social networking, rising on the back of already extensive use of instant messaging. The trigger was the introduction of mobile broadband and Facebook in 2006. Since then, the improvement in functionality of social networks that followed from the introduction of products tailored to the Indonesian market has ensured their popularity remains high in the face of strong competition from other Internet platforms such as search and content aggregators (Figure 3.1).

Figure 3.1: Indicative timeline for the Internet in Indonesia



Source: Deloitte Access Economics personal correspondence

The entry of new carriers in the middle of the last decade has also had a profound impact on Internet usage in Indonesia. Two to three years ago the price of mobile broadband dropped due to increased competition in the mobile operator space; there are more than 10 operators currently, from only one previously (Telkomsel, a subsidiary of PT Telkom, the state-owned company).

The sharp increase in competition between service providers has driven down the costs of accessing the Internet.

Parallel to this increase in competition there has been the marked reductions in the price of smart phones, PCs and, more recently, the introduction of tablets. Competition remains strong, with prices falling further in the last year – the price of Nexian’s basic smart phone has decreased by 75%, while PCs can now be purchased for under US\$500 and tablets are cheaper still (BMI 2011).

From a small base, the number of Internet users has grown rapidly in recent years. Adoption rates have grown twentyfold in the past decade (ITU 2011).

To date, the use of the Internet by households has been the main force driving the uptake of the Internet. Business and, in particular, government have responded more gradually. The latter two sectors are likely to come to the fore in driving the next stages of development.

3.2 Households

Compared to other major countries in the region, online usage among Indonesian households is still in its infancy. In 2010, less than one in ten households are using the Internet, compared to around one in six in Thailand and more than one in two in Malaysia (Gartner 2011).

The pattern of Internet usage has developed quite differently in Indonesia relative to other major emerging economies. At around 5%, PC ownership is low in Indonesia, and as a result there are relatively few households with fixed-line Internet subscriptions (BMI 2011).

However, Indonesians have much more actively embraced mobile Internet. Mobile devices offer a cheap means of communication in a country where difficult terrain has inhibited investment in fixed-line communication. Around 72% of households have a mobile phone (ITU 2011). Most are on 2G networks at this stage, although this is changing, and applications like Facebook and Twitter can be preloaded onto phones and adapted to operate on 2G networks. A survey by Nielsen in 2011 found that Indonesians who do use the Internet were more likely to access it on their mobile phones than any of the other major countries in Southeast Asia.

In addition to the popularity of social networking, the use of online news and current affairs sites have also expanded. According to Nielsen, around one-third of Indonesian Internet users access news and current affairs sites like Detik. The use of the Internet for other activities like online shopping and banking is much less widespread.

3.2.1 Internet affordability and capacity

There are marked differences in Internet penetration across income groups and between urban and rural areas.

Price sensitivity is a key issue that is inhibiting more rapid and widespread adoption of the Internet. The high cost of PCs and fixed-line Internet subscriptions relative to Indonesia's low average disposable income is prohibitive for most households, and this has led to more widespread adoption and take-up of mobile Internet.

Although the price of computers have fallen, they remain high relative to annual consumer expenditure per capita, which is around US\$1,800 (Rp 15.6 million) on average, and around US\$760 (Rp 6.6 million) for poorest 20% of the population (BMI 2011). Even for the richest 20%, who spend an average of US\$3,900 (Rp 33.8 million) per year, the cost of a PC represents around 10% of their total annual expenditure.

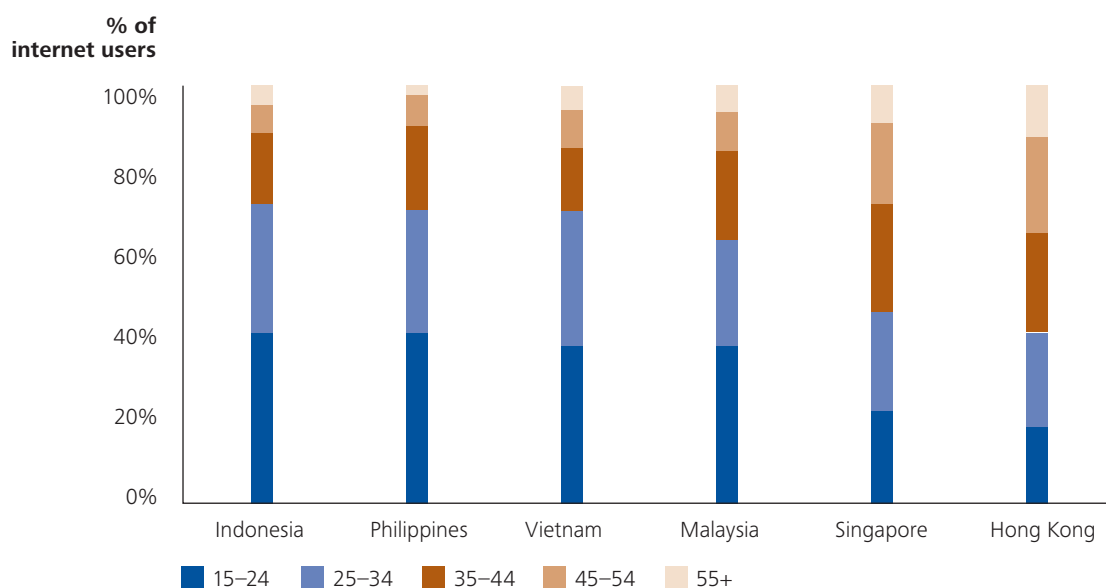
In addition, the limited bandwidth available to mobile phones restricts the range of applications that have been adopted by Indonesians. Bandwidth also restricts the potential for advertising, which is an important source of revenue for much of the web content provided in developed countries. Typical mobile Internet plans offer 500Mb of downloads per month for Rp 50,000. Download speeds for warnets are around 384Kbps.

The distribution of infrastructure throughout the archipelago is also limiting the pace of Internet adoption. The picture is currently mixed, with wireless and cables providing good coverage through the major cities but patchy coverage elsewhere. Some regional areas are only able to access less reliable satellite mobile coverage with others receiving no coverage at all. Reflecting these geographical differences, there is a clear divide between urban and regional Internet usage. In 2010, 5.1% of urban households had Internet access at home, but only 0.5% of rural households had home access (ITU 2011).

Jakarta is ahead of the country in terms of Internet usage, with other large urban centres on Java, Sumatra, Kalimantan and Sulawesi a little behind. Outside these centres, Internet usage is more rudimentary. The Palapa Ring project is the planned backbone of Internet and communication infrastructure to all the major islands and is now nearing completion.

More generally, familiarity with technology and motivation to adapt to the dynamic online environment has limited Internet take-up among sections of the community. Even more so than other countries in the region, young Indonesians are more likely to use the Internet than older Indonesians. According to comScore Inc. (2011), which surveys Internet access from home or work for a range of Southeast Asian countries, 40% of Indonesian Internet users are aged between 15 and 24, and more than 70% of users are aged under 35. While the age demographic is likely to change as the Internet usage becomes more entrenched in Indonesian society, change is likely to be slow.

Chart 3.1: Composition of Internet users, by age group



Source: comScore Inc. 2011

3.2.2 Opportunities for growth

With prices of devices and services continuing to decline and infrastructure expanding, Internet penetration is set to continue to grow rapidly. Adoption to date has largely been concentrated among younger Indonesians, who tend to be more open to change and are comfortable with technology. However, as the Internet becomes more entrenched in everyday activities, adoption is likely to increase among older generations. The Internet is also likely to play a greater role in providing services, like banking, e-government and education, and in leisure time through social networking, playing games, accessing entertainment and providing access to new products and services.

Convenience

The provision of online services like banking, social security and other government services has the potential to transform how these services are delivered to a large proportion of the population. The geographical dispersion of Indonesia poses a challenge for the provision of services outside the major cities. In many regions, accessing amenities like banks or government services can require residents to travel long distances to their nearest metropolitan centre. The ability to log on to these services over the Internet can offer a substantial time saving, and when these benefits are spread across large populations like Indonesia, the potential value to consumers is substantial.

Even in major cities like Jakarta, congestion adds to the time that it takes to conduct these menial tasks. The ability to log onto the Internet to pay bills or access government services frees up time for other productive and recreational activities.

Recreation and social networking

Most of Indonesia's Internet users participate in social networking sites. The popularity of these sites has been aided by the widespread use of applications that can be installed on 2G phones that allow users to access social networking in a rudimentary form.

Social networking sites create a 'network effect', where the value to users on the network is increased when others join and the incentives for those that are not part of the network to join increases as the network grows. This self-reinforcing phenomenon appears to be a catalyst for introducing Indonesians to the Internet.

The popularity of social networking suggests that Indonesians value the Internet. According to a study by BCG (2010), Indonesian Internet users spend around 55 minutes online each day. A comScore (2011) survey of Internet use at home and at work shows that Indonesians used the Internet for an average of 14.8 hours in the month of December 2010. Aside from communicating via social networking sites or email, other recreational activities like gaming and browsing have started to gain more widespread popularity, with gaming in particular a popular pastime in 'warnets' for younger Indonesians.

Indonesians choose to spend a reasonable share of their leisure time social networking and on other recreational Internet activities which suggests that the value they place on these pursuits is significant. Because this value is not captured in traditional measures of GDP, the economic contribution calculated in Chapter 2 understates the aggregate increase in economic wellbeing attributable to the Internet.

With social sites expanding beyond just socialising and into forums for promoting and advertising goods and services, users should gradually become more familiar with the broader array of information available on the Internet. As more online services are developed, Internet penetration will continue to increase and usage will intensify and broaden into other areas such as shopping and financial services.

Education

Government initiatives to introduce the Internet into school curriculums across the country and expand infrastructure investment also have the potential to increase the prevalence of Internet use and the intensity of use. *Jardiknas*, the National Education Network, is introducing the Internet to schools nationwide.

The ratio of PCs to students is currently 1:3200 and the government is aiming to reduce this to 1:20 (BMI 2011). The programs are also aimed at narrowing the education gap between students in metropolitan and regional areas.

In addition to the direct benefits to students, teaching young people how to use the Internet in school has the potential to provide catalysts for more widespread migration to Internet as other family members become aware of the services available.

Access to new products and services

In Indonesia, like other emerging economies, the adoption of e-commerce is still in its early stages. While SMEs increasingly have an online presence, these tend to be through social media sites or static websites that do not allow the capability to transact online. However use of online forums to link up buyers and sellers is common. There are potentially large welfare gains from accessing new products and services via the Internet and searching for lower prices, such as through extending access to financial services (Figure 3.2).

Figure 3.2: Mobile banking

Financial services – secure savings, access to loans and insurance – are recognised as being an essential part of the development puzzle. In Indonesia, where 60% of adults do not hold bank accounts ('unbanked'), but 85% have mobile phones, online banking has the potential to deliver significant benefits.

The unbanked population largely reside outside of the major metropolitan areas, and mobile banking has the potential to substantially expand Internet use and economic development in rural Indonesia.

Mobile banking can provide a means of making payments without physical access to the banking system, as well as basic financial services to help smooth cash flows and provide a safe means of storing income during the good times and access to insurance during tougher times. It involves providing basic services using mobile telephone numbers for identification and leveraging of local SMEs to provide a branch network.

Payments services supported by major banks have been successfully launched in many developing countries, such as Kenya, India and Fiji. Mobile-to-mobile services allow small sums to be transmitted.

Security remains a concern at present, together with the risk of seller fraud and poor product quality.

Nonetheless, sites that provide product information, comparisons and reviews are increasing in popularity (Figure 3.3).

Figure 3.3: Go-Jek

Go-Jek is a motorcycle courier service that transports people and delivers products across the south and central areas of Jakarta. While still in its infancy, the business has, in a short space of time, grown rapidly. Its success has been driven by two key areas: the ability to build trust and its investment in internal systems.

Building trust with customers is a key determinant of achieving success in Indonesia. Go-Jek is achieving this through its use of social media networks such as Twitter.

Twitter allows existing Go-Jek customers to post feedback and comments regarding its services and therefore provides an effective advertising and referral system.

While the concept of a motorcycle taxi in Jakarta is far from new, Go-Jek places a strong emphasis on reliability. The logistics of a motorcycle courier service presents many challenges; however, through its investment in its internal, logistics system, Go-Jek is able to track motorcycle drivers; provide advice to drivers via the Go-Jek call centre; and its drivers are able to tap into information via mobile devices.

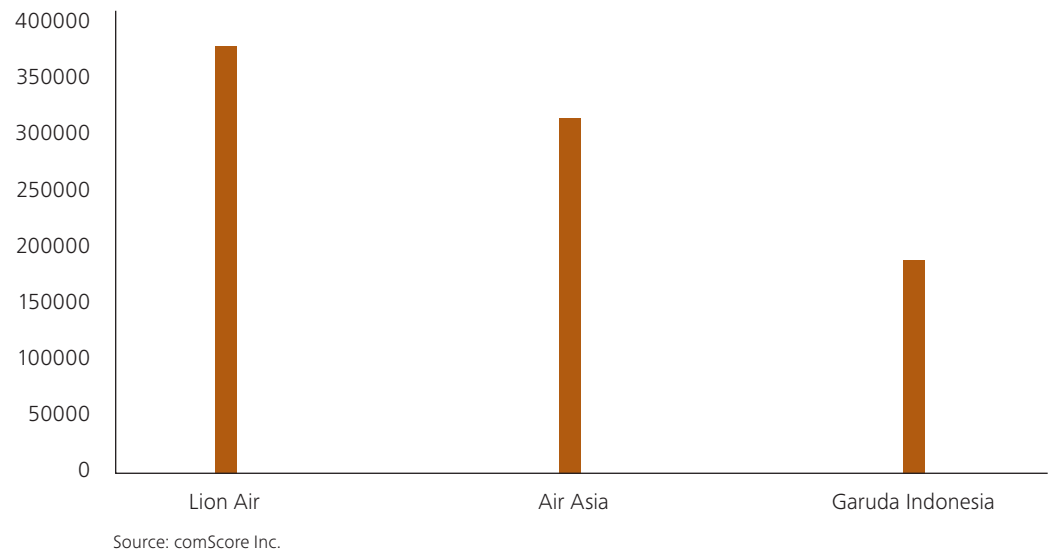
Source: Deloitte Access Economics consultation, Springwise.com



Moreover, despite these concerns, Indonesians' willingness to adopt new technology, subject to affordability, is evident in the way they are starting to embrace online banking and airline ticketing (Chart 3.3):

- Currently, online banking in Indonesia comprises remittances sent home from guest workers and, to a lesser extent, bill paying. ATMs are gaining in popularity, mainly to transfer funds, but increasingly to access other services
- Although the use of Internet for financial activity is still yet to really take off, around 6% of Internet users in Indonesia purchase goods and services online or use financial services, which is slightly higher than Philippines or Thailand (Nielsen 2011)
- A survey of Indonesian Internet users estimated the number of unique visitors to bank websites reached 749,000 at the start of 2011, a 72% increase on the previous year. The two most popular sites were Bankmandiri.co.id and BNI.co.id (ComScore 2011)
- Bank Mandiri experienced a four-fold increase in personal loan applications within a year of offering Internet users the ability to submit applications online (Figure 3.4). Around 30% of new loans by value come from the Internet (DAE, personal correspondence).

Chart 3.2: Unique visitors to airline sites



This means that e-commerce will become much more pervasive if use of the Internet for purchasing airline tickets and online banking are examples of what is likely to happen more broadly as access widens.

Figure 3.4: Mandiri Consumer Loans

The Mandiri Consumer Loans Division wanted to increase sales lead from its online application forms, which gave five leads per day. They also wanted to increase the cost effectiveness of their marketing budget.

As an illustration, a half page print ad in popular newspapers in Indonesia costs Rp250 million.

The Consumer Loans Division started the always-on campaign with Google AdWords in July 2010. The online application forms now generate an average of 300–500 leads per day from AdWords clickthroughs.

Rather than relying on direct sales effort at malls, where they would open booths and hire sales people to acquire new customers, online applications now have a 55% higher response rate.

AdWords has also helped reduce expenditure, with AdWords costing Rp15,000 compared to the an average direct sales

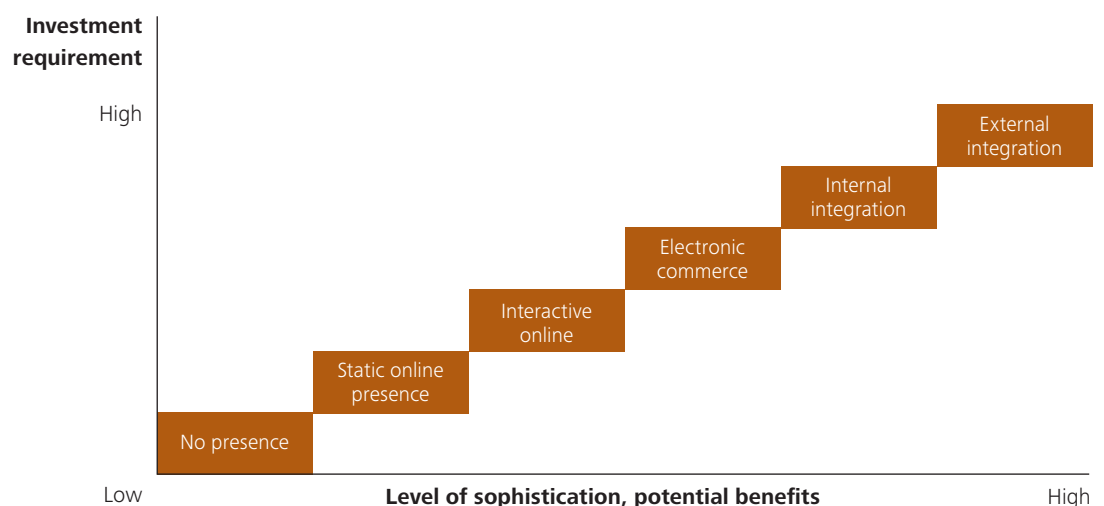
Source: Deloitte Access Economics consultations

3.3 Business – following the leaders

The success of a new technology such as the Internet depends on the readiness of the adopters. Large companies can more easily find the resources to invest in new technology. This is the case in Indonesia, where some large companies have travelled a long way along the e-commerce path.

In Chart 3.3, these large companies would have reached a point where they interact online with buyers and sellers, undertake e-commerce, and have adapted their internal organisational structure to Internet solutions. On the other hand, the majority of SMEs still have no presence online or only a static presence which is likely to reflect a lack of awareness of the potential benefits that the Internet can bring as well as its affordability.

Chart 3.3: E-business stages of growth



Source: Kurnia 2006

The cost of adopting new technology also explains why studies sometimes show lack of benefits to developing countries starting out along this path, but significant benefits for advanced countries that are well along. Moreover, because the benefits are nonlinear, developing countries stand to gain most when they provide an economic and regulatory environment that speeds diffusion of new technology efficiently and effectively (see Section 3.4).

Importantly, encouraging SMEs to go online to expand their business is a key to raising living standards, because their businesses are the main source of employment and income for low income communities.

3.3.2 SMEs starting from a low base

Many businesses are small family-run shopfronts or stalls for which labour costs are low, little is known of the benefits of the Internet, or the benefits of the Internet do not (yet) outweigh the costs. Nonetheless, for many firms the Internet is part of their everyday business:

- SME engagement with the Internet reflects how their customers and suppliers are using the Internet
- SMEs are using the Internet to solve different problems, including distance and congestion
- Trust is a key issue for doing business online.

Figure 3.5: Two Jakarta fashion retailers



Kayla Collection, in Cipulir, is one of three fashion shops specialising in uniforms and office wear in Indonesia and is run by Tika. Companies can order staff uniforms through the shop's website (www.kaylafashion.com) and many customers have advised that they arrive at the store after searching for specific items rather than the shop name.

In-store sales currently account for 70% of total sales, but Tika is hoping to expand the website business to account for more than the physical business, per Tika 'because the website is easier to manage'.



Java Collection is a new business situated in Tanah Abang that sells underwear to retail and wholesale clients throughout Indonesia. Proprietor Nelwati has been using the Internet portal Tokobagus.com for six months, placing her products on a message board for customers to see. Around 20% of sales come from the Internet. Nelwati uses the Internet because it offers her, 'more ways of promoting and reaching people'.

While both businesswomen access the Internet in different ways, their customers come from all around Indonesia and pay for their purchases online by transferring money into the store's bank account using ATMs. Suppliers, too, contact the businesses via the Internet, although the women surveyed above prefer to use brick and mortar established suppliers.

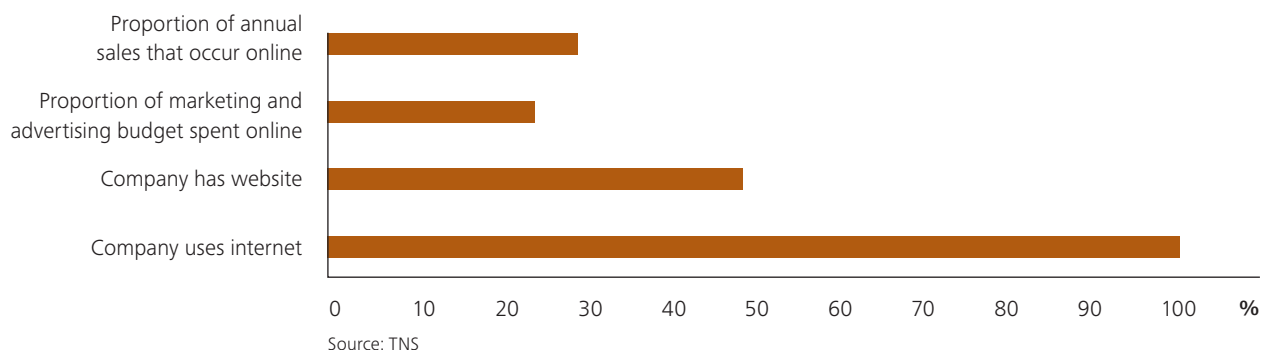
Source: Deloitte Access Economics consultations

A survey conducted by TNS of 200 firms which use the Internet and have annual turnover of up to Rp 2.5 billion (US\$ 0.3 million) shows firms at every stage of the e-business growth cycle. Beyond the efficiency gains typically associated with the Internet, other important insights from the survey were:

- A high proportion of respondents reported improved access to domestic customers and suppliers, thus reinforcing business networks within Indonesia
- Added workplace flexibility, potentially enabling firms and workers to avoid the problems caused by congestion in major urban centres.

Chart 3.4 demonstrates that of SMEs using the Internet, 47% have a website providing basic information about their products and services (94 companies). Of this group, 12% (24 companies) had more advanced websites with ordering and booking capability and 1% (two companies) had sites with fully integrated e-commerce capabilities. On average, companies reported they made 29% of annual sales online, a number that compares favourably with developed economies such as Australia (TNS 2011).

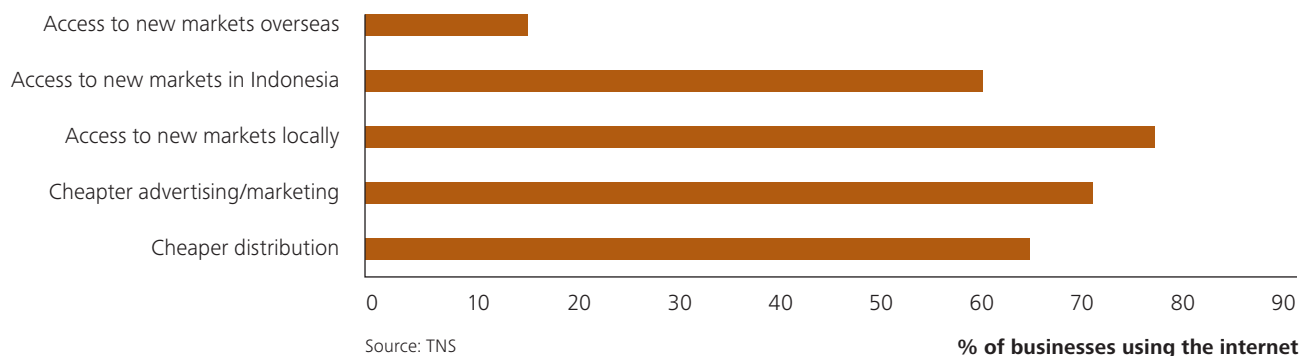
Chart 3.4: SMEs – Internet presence



The survey also revealed what SMEs felt were the main benefits of using the Internet for business (Chart 3.5). The improvement in access to new markets within Indonesia was seen as a major benefit.

Moreover, given the difficulties of logistics in Indonesia, it is noteworthy that two thirds of SMEs surveyed benefited from cheaper distribution of their products and services thanks to the Internet.

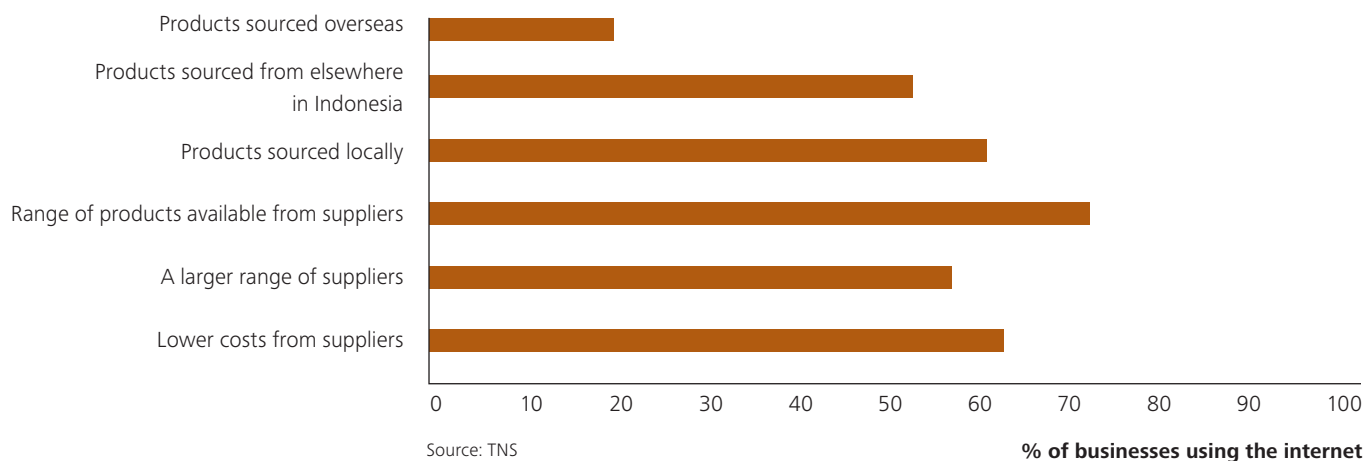
Chart 3.5: SMEs – Internet and customers



E-procurement was a major attraction of the Internet, with a majority of SMEs reporting a greater range of products and suppliers, at lower prices (Chart 3.6).

Moreover, around 60% of firms were using the Internet to source supplies locally (within their region) or elsewhere in Indonesia, creating new links between businesses throughout the country.

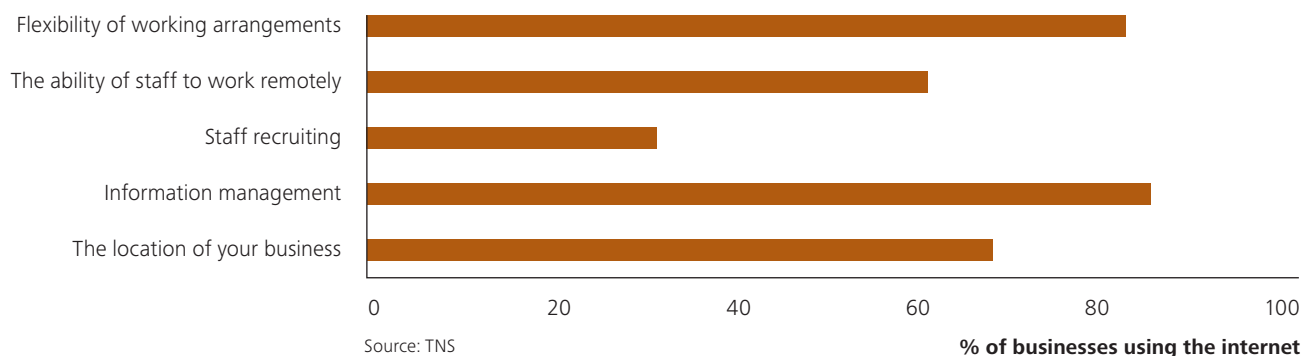
Chart 3.6: SMEs – Internet and procurement



When it came to using the Internet to change the internal structure of their business, a large majority of respondents valued the improved flexibility of working arrangements and information management (Chart 3.7).

The capacity for staff to work remotely and for a business to be freed from having to be located close to suppliers and customers was also seen as a benefit by a majority of respondents.

Chart 3.7: SMEs – Internet and organisational structure



The results of the study show that even firms without their own websites are benefitting in many ways from the Internet (Figure 3.6 and Figure 3.7). Therefore, it is important to educate and persuade SMEs of the benefits of the Internet.

Given the investment required for SMEs, it is also important to provide education to help reduce the risk of failure, inappropriate and inefficient use of the Internet. This has been recognised and enterprising service providers, such as PT Metranet, are moving into this space and creating innovative solutions for SMEs (Figure 3.8).

Figure 3.6: PT Wahana Indonesia Transport

PT Wahana Indonesia Transport is a car rental company in Jakarta. Founded in 2003 by Veronica Ratnasari, a housewife, the company employs 12 staff and manages a fleet of 28 mid-segment and luxury cars.

Competition from international car rental players in Indonesia encouraged PT WIT to differentiate. Veronica already offered flexibility in rental terms and provided 24-hour customer service. However, she wanted to find new ways to attract customers.

Veronica focused on building PT WIT's online presence. Her objective was to build awareness and give Internet users plenty of information about her car rental service. As a small business owner with a limited marketing budget, Veronica found that AdWords offered a highly cost-effective way to drive traffic to PT WIT's website and increase phone inquiries and sales leads.

Since Oct 2008, traffic to the PT WIT site has increased more than 100%. Veronica has also started advertising to neighbouring countries; 15% of PT WIT customers now come from outside of Indonesia.

Veronica says, "my business has expanded tremendously these past years thanks to AdWords. I started only with 10 standard cars. Now I own 28 cars ranging from mid-segment models to luxurious models".

Veronica can also use AdWords reporting to see which search keywords are the most popular; as a result, she can decide which car types and rental coverage areas to invest in. Veronica has expanded her business into two companies: PT WIT for the mass-market, and Brysca Rent Car for the premium segment.

Source: Deloitte Access Economics consultations

Figure 3.7: Rempoa Computer

Rempoa Computer, based in Jakarta, provides a range of computer goods and services including spare parts, modems, data cables, content and accessories to customers throughout Indonesia.

Rempoa Computer has been operating using the Internet for the large part of the past decade, but has experienced a rapid change in the use of the Internet as part of how it operates and in particular in the last 12 months. Currently, 60% of their sales are generated by online transactions and over half its customers are from outside Jakarta.

Rempoa Computer uses a range of channels to communicate with customers including social media networks, messenger services such as Blackberry Messenger and Yahoo messenger and e-commerce portals such as Indonetwork and Toko Bagus. Its main form of advertising is by posting threads on websites that customers are able to find through search engines.

Providing a range customer touch points allows for more sophisticated sales and services to be provided. Providing an attractive web design, up-to-date prices and prompt downloading or response time for services has enabled the business to attract new customers. Rempoa Computer plans to develop a standalone website in the future.

Source: Deloitte Access Economics consultations



Figure 3.8: PT Metranet

The digital landscape in Indonesia is transforming itself at a blistering speed, largely driven by a few entrepreneurial players, who are reinventing themselves in the process. Operating chiefly as an online commerce and content portal company, MetraNet is striving to spur Indonesia's digital economy and help it leapfrog other emerging markets in the region. Chief Executive Officer Iriana Muadz sees MetraNet as a 'leader of a breakthrough social change that will alter the lifestyle of many Indonesians and society in general...and at the same time contribute towards the government's efforts at developing our economy.' Ms. Iriana's vision matches the reality of a growing class of well-educated, globalized Indonesian consumers who have both the means and the desire to emulate the high standard of living found in many developed nations.

To that end, MetraNet has developed a number of properties within the eCommerce space. Its flagship portal, Plasa.com, is a popular online e-Commerce site focused on the high-end consumer retail market. Plasa Ticket is an online event ticketing website which has sold out local concerts for artists like Andrea Bocelli. Plasa.com is particularly aligned to Ms. Iriana's intent allowing MetraNet to both serve consumers and on the other hand provide entrepreneurial solutions to SMEs (such as sales support, provide online marketplace, so that SMEs doesn't need to set up their own website and procurement/ logistics services).

The company has trained its sights especially on the twin critical elements of logistics & supply chain, as it continues to introduce global best practices through international alliances and partnerships. Chief Commercial Officer Ariadi Anaya says, "Even some of the largest Indonesian retailers do not have a well-established logistics process in place."

Attempting to achieve such a lofty goal naturally brings its own set of challenges. Chief Operations Officer Widi Nugroho believes the central question to Metranet's success revolves around how to make the Internet 'pipe' more productive and how to monetize digital technology. A seasoned Telco veteran, Mr. Widi notes that, "With a 'dumb' pipe, [all it does is] just deliver; with a 'smart' pipe we can focus on the individual." At the back end, a unique logistical challenge arises due to the fragmentary nature of the Indonesian archipelago. As Mr. Ariadi says, "[There are] challenges of island logistics to overcome," referring to the difficulty of setting up retail distribution & delivery for several thousand islands.

Like all startups, MetraNet is under intense marketplace pressure to succeed sooner rather than later. The competitive outlook has also changed drastically in recent months, marked by numerous foreign entrants in recent times. Notable among them are Japanese e-commerce giant Rakuten's tie-up with media conglomerate PT MNC, and social-buying website Groupon's acquisition of local player Disdus.

Source: Deloitte Access Economics consultations

One widely recognised way to minimise the cost of using the Internet for SMEs is to employ cloud computing and open source software (OSS). In 2011 PT Bakrie Connectivity launched AHA Office in a Box powered by Google Apps, which include a range of cloud computing services targeted at SMEs seeking IT support. PT Telkom and India's InstaCompute have also started offering cloud computing (see Appendix C for an elaboration of the attractions of cloud computing for SMEs).

3.3.3 Large businesses have embraced the Internet

In Indonesia, large businesses are more advanced in their use of the Internet. For firms such as Shell usage is similar to that in developed countries (Figure 3.9). There is a willingness to use innovative solutions to solve problems that beset businesses in developing countries, such as lengthy supply chains. Crucially, firms are recognising the advantages of the closer relationships to suppliers and customers that the Internet provides.

Figure 3.9: Shell story

PT Shell Indonesia (www.shell.com/indonesia) sells downstream oil products to business and motorists, directly and through a network of distributors located in and around Jakarta and Surabaya. Shell Indonesia uses the internet extensively to manage all aspects of its business, says Julio Manuputty, Country Lead Contract & Procurement Manager at the company's headquarters in South Jakarta.

Distributors and businesses buying petrol and lubricants have embraced the switch from a call centre to online ordering.

Shell also uses the internet for e-procurement, hosting online auctions to obtain supplies e.g. packaging, as done by other energy companies. Auctions are efficient compared to manual tenders that can take up to four weeks, and give 'local' prices.

While usually large and medium-sized companies are involved in the bidding online, as e-procurement becomes prominent in other industries more suppliers are moving online.

Shell employees also benefit from the arrangements, with teleworking widespread when needed. Office staff working from home and the sales force on the road use flashcards and internet modems to stay connected.

Over the next two to five years, Julio sees increased adoption of the internet leading to more use of online bidding, digital advertising and marketing, B2B e-commerce and pre-paid fuel cards. To accommodate this will require improvements in infrastructure, skills and applications, but on the positive side, 'you do have lots of enthusiasm'.

Source: Deloitte Access Economics consultations

3.4 Government – opportunities and challenges

The Internet is a digital highway extending commercial opportunities to far flung regions of Indonesia and overcoming the constraints of time and space to create a virtual community online. Building the highway is challenging and requires investment and collaboration from diverse stakeholders. The payoff from investing in digital initiatives – such as mobile banking – to make the leap to the next stage of economic development, is measured in terms of social inclusion and poverty reduction.

Encouraging ways to extend the digital highway as widely as possible will help to realise the net benefits of the Internet. A fibre-based broadband network is the gold standard, but is very expensive. Given the realities of the profit imperative for private investors and budget constraints on governments, it is likely that a range of delivery methods, in addition to fibre broadband networks, will need to be employed. In Indonesia, mobile Internet is a major part of the solution.

Policy makers also have an important role to play in providing the right environment to encourage all of these key stakeholders to play their part. The Indonesia government recognises the potential of the Internet and has been putting into place plans for the Internet. However, there are significant challenges in realising these plans, especially given the speed with which things are evolving.

3.4.1 Old for new – how e-development complements traditional development policies

The benefits of the Internet to developing economies are expected to be quite different, relative to the impacts that have occurred in advanced economies, reflecting a range of socio-economic, political and capital disparities.

Unlike developed economies, developing economies rely heavily on the agricultural sector which is generally located in rural areas. In Indonesia, much of the population lives in rural areas relying mainly on income from farming.

The most effective strategies for government in spurring innovation in the agricultural sector are good quality physical infrastructure; efficient financial intermediation; rural research institutes (particularly in the early stages); and modest and strictly time-bound subsidies to induce risk averse farmers to adapt new technologies (Hill 2001, p.39).

Importantly, many of the policies used to promote e-development have their roots in traditional development policies.

For example, improving telecommunications infrastructure and raising education attainment are at the centre of traditional development policies and are also core to encouraging Internet penetration.

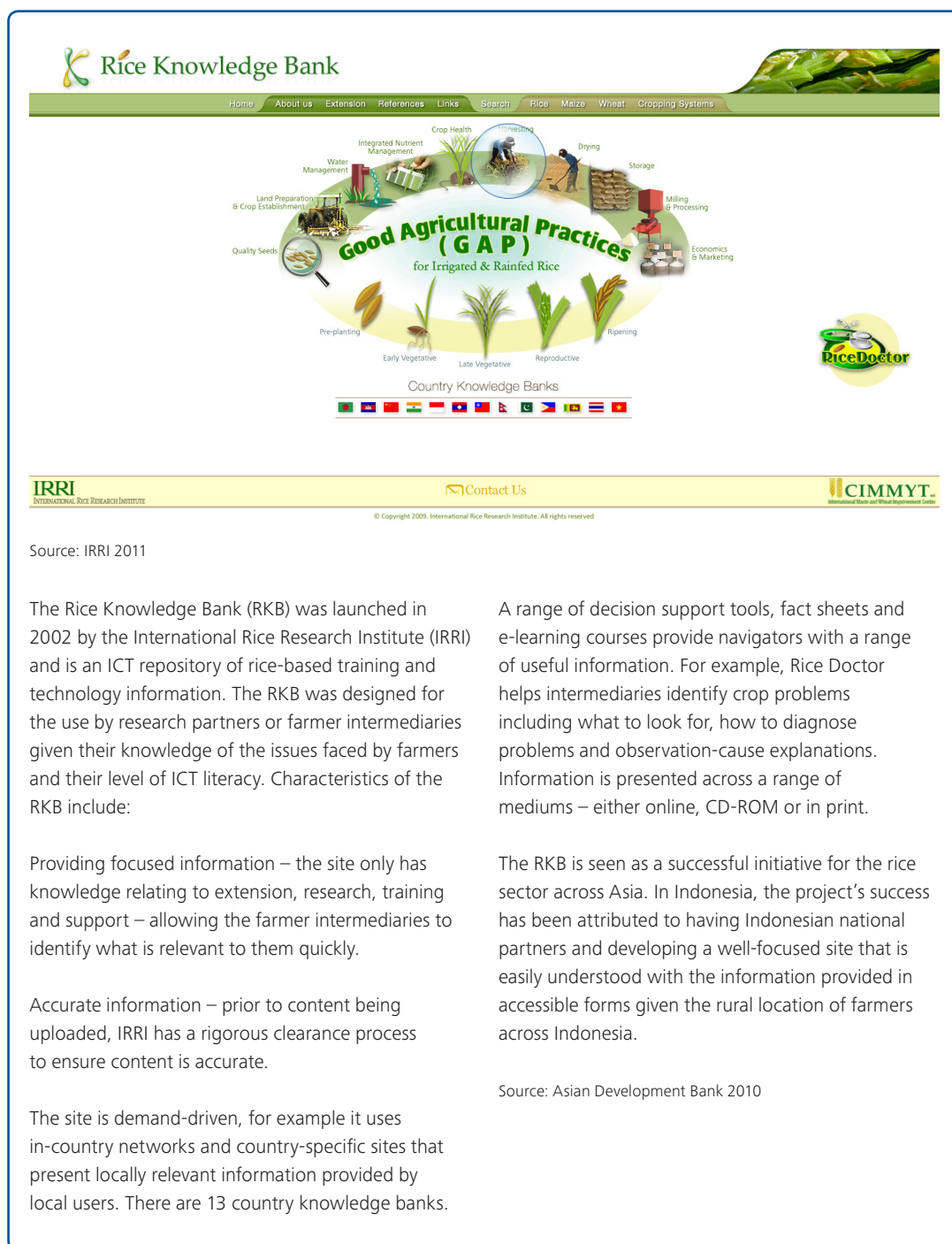
Table 3.1 illustrates how the two streams of policy complement each other in many ways and Figure 3.10 provides an example of how the intersection of agricultural development and Internet development policies can work.

Table 3.1: Summary and relevancy of various policies

Policy	e-development	Traditional development
Improve telecommunication infrastructure	Yes	Yes
Improve other infrastructure (i.e. electricity)	Yes	Yes
Improve education in all sectors (including English)	Yes	Yes
Government use and promotion of ICT	Yes	Less relevant
Increase access and diffusion of ICT and the Internet	Yes	Less relevant
Improve domestic demand for ICT	Yes	No
Encourage software development by local firms	Yes	No
Encourage adaptation and imitation by local firms	Yes	No
Encourage use of ICT by local exporting firms	Yes	Yes
Foster democracy	Yes	Yes
Strengthen intellectual property rights	Yes	Yes
Strengthen financial and legal sectors	Yes	Yes
Revise competition policies	Yes	Yes

Source: Clarke 2006

Figure 3.10: Case study: Impact of ICT on rice farmers



3.4.2 Planning for the Internet

The Government's national ICT vision is 'to bring into reality a modern information society, prosperous and high competitive, with strong supported by ICT' (Moedjiono 2009). Most government-led ICT developments have occurred over the last decade commencing with the establishment of the Ministry of Communication and Information in 2001.

Regulations have been established and a range of ICT projects targeting different sectors and areas of the economy have been introduced. Figure 3.11 summarises the government's ICT flagship program developed in 2006.

Figure 3.11: ICT flagship programs

In 2006, the government's National ICT Council – DETIKNAS, was established. The National ICT Council has focused on seven flagship programs:

Palapa Ring project – Which aims to connect all 440 districts across Indonesia to a core domestic backbone network facilitating increased telecommunication penetration.

Government software legislation – Promoting legal software use in every government institutions, through the use of both proprietary software and open-source software.

E-education – Implementing education system based on ICT application and combined with distance e-learning for the levels of junior and senior high schools across Indonesia.

National Single Window – Integrating and delivering export and import trade services in a single government website, including customs and exercises completion, shipment of goods, bank transfer and remittance, insurance, licensing, etc.

E-procurement – Developing a system to deliver services to the public interactively through online mechanisms (including government goods and services procurement).

E-budgeting – Coordinating and streamlining state budgeting processes through a single government website hence generating fair, transparent, and accountable processes involving the Parliament and related government institutions.

National Identity Number – Implementing a National Identity Number for every citizen as a unique identification, social security, government administration, taxation, banking, insurance, general election, etc.

Information village – Program by the Department of Education to wire up schools in 1000 villages.

Many of these initiatives are well underway or nearing completion, such as the Palapa Ring project providing infrastructure; wiring up schools and providing PCs so the next generation of Indonesian workers are Internet savvy; and adopting e-procurement and the National Single Window which will encourage more businesses to go online.

3.4.3 A light touch

The geographical separation of Indonesia, the diverse ethnic and linguistic characteristics of the population, and the multiple levels of government presents numerous challenges for the central government in unifying the nation and implementing policies consistently across Indonesia. Policy coordination across Indonesia is one of the government's challenges.

A holistic approach is required to guard against unintended consequences of well-intentioned policy. The level of regulation, particularly regulations impacting on, for example, Internet Service Providers (ISPs) affects Internet penetration. Research suggests that countries requiring ISPs to obtain formal approval prior to commencing operations act as a barrier to entry and have fewer Internet users and Internet hosts (Wallsten 2003). Moreover, ISP price regulation is correlated with higher ISP final-user prices. This research suggests that reducing barriers to entry and promoting competition within the industry is likely to lead to higher Internet penetration and hence better outcomes and additional benefits associated with increase Internet presence.

Proactive policy measures to foster Internet development and reap the benefits of this development include:

- Increasing the bureaucracy's use of the internet
- Initiatives to lower the cost of access, by ensuring competition is strong between network providers and handset manufacturers
- Encouraging content providers and smes onto the internet by removing barriers to entry; anti-competitive regulations and setting clear demarcation lines to avoid overlapping regulators
- Reducing uncertainty in regulation, including co-ordinating multiple levels of government and across departments and other institutions, to avoid countervailing or compounding regulations
- Discouraging piracy and corruption, which destroy the incentives for private investors
- Engaging in broad and transparent consultation in developing legislation and prior to implementing regulations
- Limiting the use of regulation to control content, which discourages innovation, to a focus on extreme activities.

Minimising impediments to the expansion of the benefits of the Internet will help strengthen economic development and social cohesion throughout Indonesia.

4

Prospects for Indonesia's Internet economy



115

2011

324

2016

4 Prospects for Indonesia's Internet economy

The direct contribution of the Internet to the Indonesian economy is forecast to increase from 1.6% of GDP to 2.5% of GDP over the next five years

Indonesia has the potential to accelerate use of the Internet to help speed its economic development. The use of the Internet is already growing quickly across all user groups, but from a low base. Strong growth in fixed-line connections is planned, and continued rapid growth in mobile connections seems assured, but the main challenge is price; specifically, what is the tipping point at which the price of devices and access falls far enough for the majority of middle-income earners to go online?

Rapid uptake in urban areas could easily result in a doubling of the Internet's contribution to GDP from this group of users. However, growth in regional areas will be slower because it will take time to roll out the needed infrastructure. Moreover, the net benefits of the Internet are likely to be most pronounced if regulation is kept to a minimum.

The direct contribution of the Internet to the Indonesian economy is forecast to increase from 1.6% of GDP to 2.5% of GDP over the next five years. Yet, it could, with the right incentives, grow even higher.

The anticipated increase in size of the Internet network reflects:

- The extent of acceleration possible
 - For example, in china, at a comparable stage, internet use tripled between 2006 and 2010, from 10.5% Of the population (aged six and over) to 34.3% (Itu 2011)

- Increased internet penetration raises economic growth in developing countries. For example, the world bank estimates that each 10 percentage point increase in broadband penetration increases economic growth by 1.3 Percentage points (qiang 2009).

- The sharp improvements in affordability of relevant devices
 - Prices of locally-made smart phones in mid-2011 were 75% lower than a year earlier.
- Recent trends in key indicators of access, use and expenditure
 - Key indicators have doubled since 2008, accelerating in the last two years.
- Forecast strong growth rates for the economy
 - The international monetary fund (imf) predicts GDP growth rates of between 6% and 7% out to 2016.

The potential growth of Internet use in Indonesia is also supported by other research such as that by BMI (2011) which has estimated that the ICT spending will grow by an average of 18% annually in this period and Gartner (2011) has estimated that the number of mobile devices will grow by 7% annually between 2011 and 2015.

This chapter considers the readiness of Indonesia to capitalise on the expansion of the Internet, introduces indexes to chart the spread of the Internet and concludes with an assessment of the outlook over the coming decade.

4.1 Internet readiness

This section assesses the country's readiness to take advantage of the opportunities offered by the Internet by exploring the Internet's potential to contribute to economic welfare and wealth creation in Indonesia. The focus is on the economic and social factors that will facilitate further integration of the Internet as well as those that, at present, may pose potential limitations.

As part of this assessment, data is drawn from *The Global Information Technology Report 2010–2011* released by the World Economic Forum in partnership with INSEAD. This is the latest in a series of reports spanning the last decade monitoring global ICT development.



As a general indicator, the World Economic Forum produces a Networked Readiness Index (NRI) which measures the capacity of individual countries to benefit from new information and communications technologies. By this measure, and relative to other countries, **Indonesia has shown broad improvement over the past five years, rising from a rank of 62 out of 122 economies in 2006–2007 to a rank of 53 out of 138 economies in 2010–2011.**

Indonesia has a favourable market environment when it comes to the development and take-up of new Internet-enabled technologies. This is especially so in the areas of venture capital availability (where it ranked 9th out of 138 economies in 2010–11) and cluster development.

This suggests accessibility to financing as well as positive market conditions for research and development (R&D) that will enable greater interconnectedness, with the potential for higher industry productivity and competitiveness.

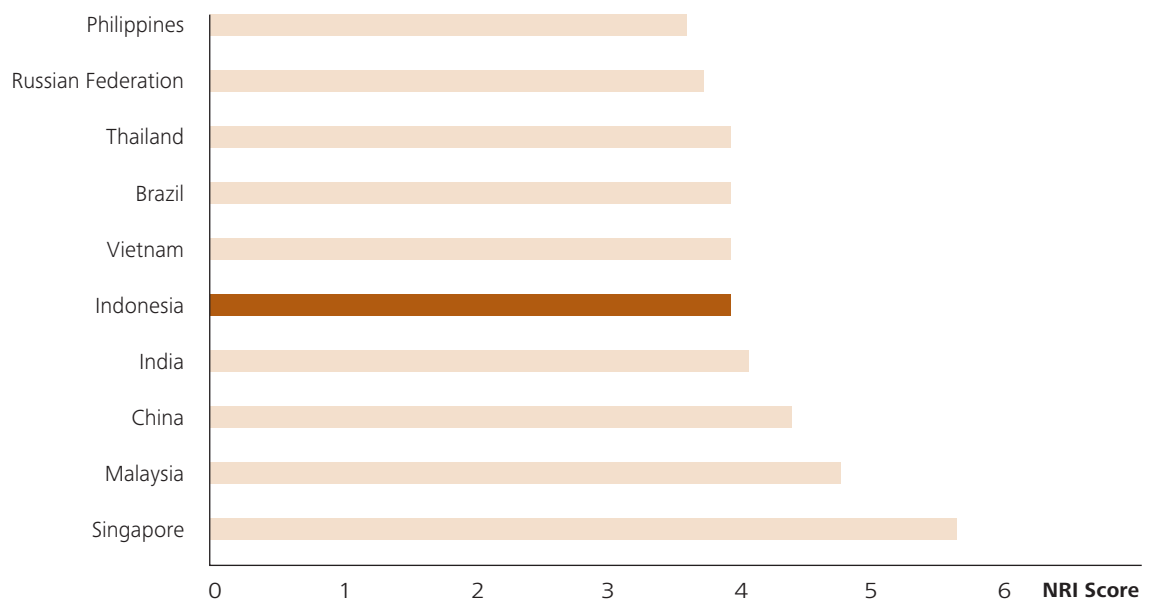
The country lags others in its ability to address software piracy, ranking 98th in 2010–11. There is also significant room for improvement in infrastructure. Indonesia is placed outside of the top 100 economies when it comes to electricity production, the availability of secure Internet servers and the bandwidth of international Internet. This implies substantial growth potential in the Internet's economic contribution to Indonesia's development.

Both the private and public sectors in Indonesia appear well-positioned for greater expansion of the Internet. Notably, Indonesia ranks well on tariffs on mobile cellular phones, suggesting a low barrier to the spread of new mobile Internet technologies. Company spending on R&D is relatively high in the country and so is the level of staff training within private businesses. Similarly, the government is active in its procurement of advanced technologies.

Metrics of current ICT usage presents a slightly different picture. While the use of virtual social networks appears relatively high, the number of households with personal computers is low, with Indonesia at 106th in 2010–2011.

Plausibly, the penetration of personal computers is a less than complete indicator of Internet usage, as mobile wireless access via other devices becomes increasingly available. There is also evidence that Internet usage is heavily concentrated, in the younger age groups and higher income families. The Networked Readiness Index (NRI) Score comprises the environment for information technology, the readiness of stakeholders and usage. For the NRI component comparing the numbers of internet users per 100 people, Indonesia ranks behind Singapore and ahead of the Philippines (Chart 4.1).

Chart 4.1: Networked Readiness Index – comparison of internet usage*



Source: World Economic Forum

* In the Networked Readiness Index countries receive a score for each component, based on their ranking against specific performance criteria. The scores for various components of the NRI are combined to produce an overall ranking.

4.2 Charting the development of the Internet economy

The impact of the Internet is only starting to be felt in Indonesia. Past advances such as radio and electricity took decades to deliver their full potential. The Internet will move faster and, if so, indicators of the spread of the Internet should show rapid progress.

To illustrate and measure the spread of the Internet, it is instructive to view how access, use and expenditure have been increasing. The indexes constructed to measure this increase show a rapid growth in the last few years, from a very low base and have been constructed with an eye to charting growth in the future:

- **Access:** the increase in the number of Internet connections for households and businesses, and the international bandwidth per person
- **Use:** increases in the number of searches completed by Internet users
- **Expenditure:** spending on PCs, mobile devices, and mobile and fixed-line Internet access.

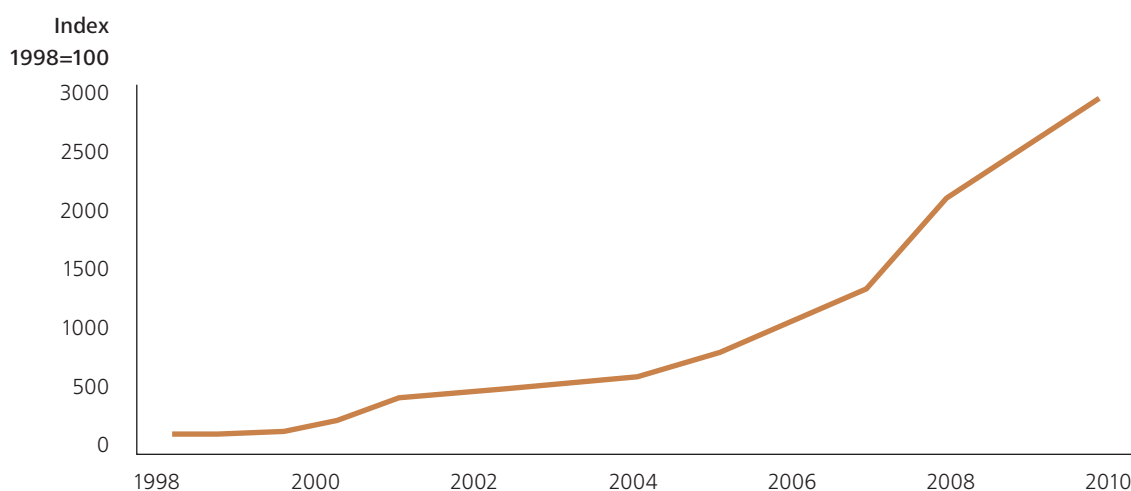
The indices show exceptionally strong growth over the past decade, though the increase is exaggerated by the small base a decade ago. Components of the indices are discussed in more detail in Section 4.3, in the context of outlook for growth in the Internet's contribution to the Indonesian economy.

4.2.1 Access

The Access Index provides a sense of how the number of Internet connections and the international bandwidth is changing over time. The Index comprises data on the number of Internet users and the average bandwidth measured in megabytes per person per second.¹

The index has accelerated over the past year, with particularly rapid growth in recent years. According to ITU, the pace of Internet take-up has eased somewhat in recent years with close to 10% of the population now using the Internet. In contrast, international bandwidth has climbed sharply in recent years to bring the available bandwidth per user to 3,207 Mbps, slightly behind India.

Chart 4.2: Access Index: Growth in Internet users and bandwidth



Source: Deloitte Access Economics, International Telecommunication Union

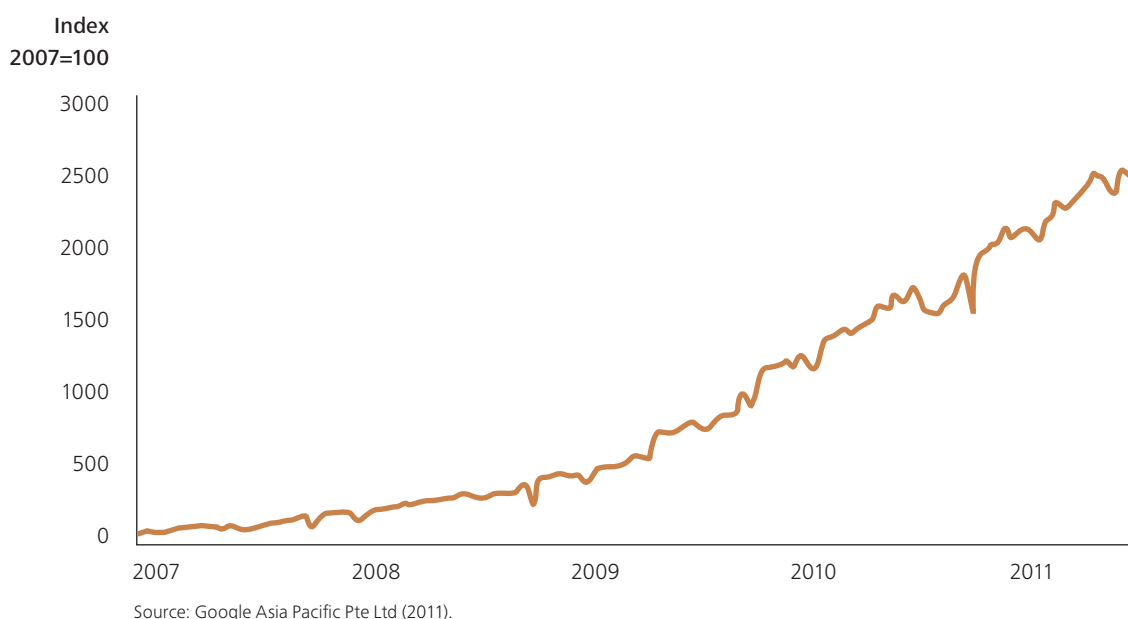
¹ It should be noted that the bandwidth is likely to reach a point at which the additional benefits from more will diminish as the connection speed increases. Our index has not adjusted for this because data is not available to explicitly measure the additional benefits associated with increased speeds.

4.2.2 Use

The Use Index depicts the average growth in Internet search across a wide range of categories in search in recent years (Chart 4.3). The average number of searches per category undertaken since 2007 has grown at a phenomenal pace, with around 2,500 more searches at the start of 2011 compared to the start of 2007.

Although the burgeoning growth partly reflects that the base number of searches in 2007 was small, the pace has remained strong throughout the period. The increase in the number of Internet users in recent years has contributed to the sharp increase in search, but it is largely driven by more intense use of the Internet. After Malaysia, Indonesia had the second highest total searches of Southeast Asian countries (comScore 2011).

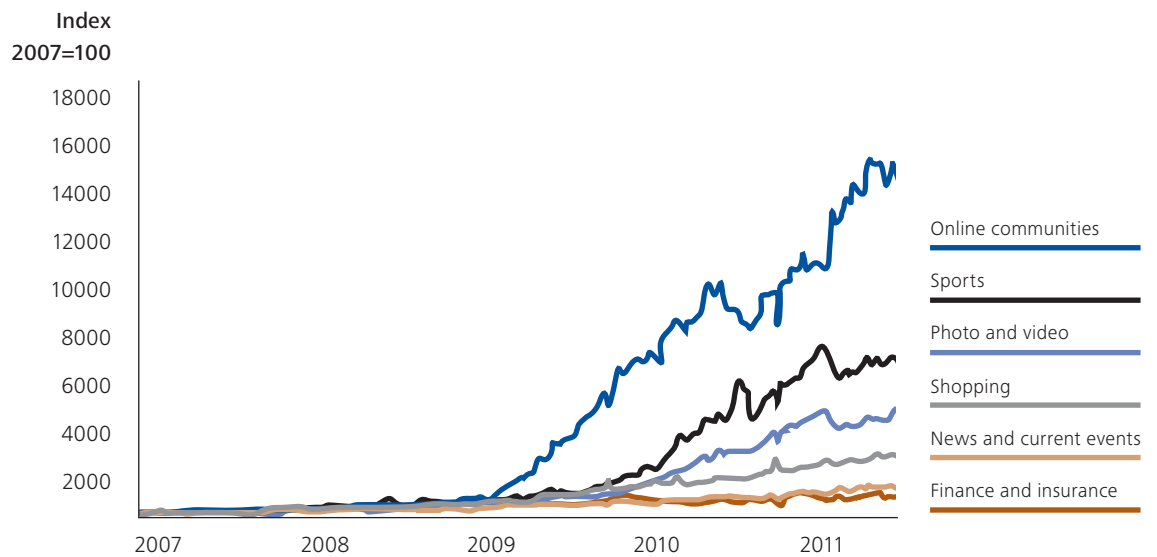
Chart 4.3: Use Index: Use of search on the Internet



The category that has experienced the biggest jump is online communities, with nearly 4000 times more searches in the first half of 2011 compared to the first half of 2008 (Chart 4.4). Searches for online video sites and sports sites have also grown more rapidly than other categories, with Indonesians tending to use the Internet for recreational purposes.

However searches for news and current affairs sites were amongst the fastest growth searches in 2011, suggesting that Indonesians are starting to perform more types of activities online. However finance and insurance-related searches have been amongst the slowest growing areas for search which indicates that there are still some popular online activities in the more developed world that have yet to gain traction in Indonesia.

Chart 4.4: Growth in Internet searches by category



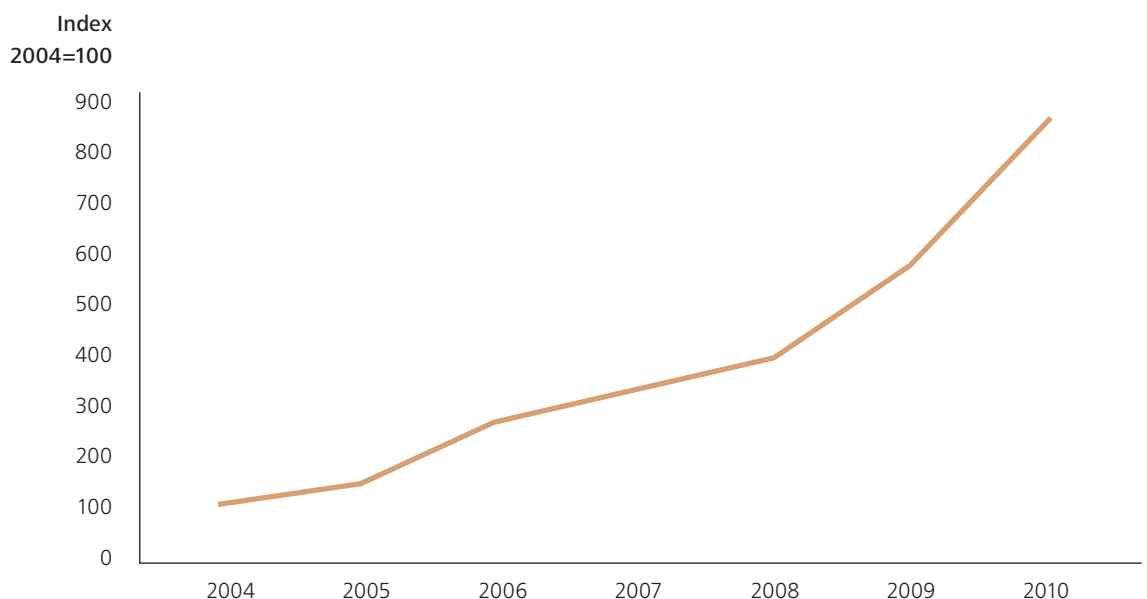
Source: Google Asia Pacific Pte Ltd, 2011

4.2.3 Expenditure

The Expenditure Index charts the increase in spending on the Internet by consumers and business. Spending data on PCs, mobile and fixed Internet access and premium mobile phones were combined.

The index has doubled over the past three years, growing at around five times the pace of GDP. Given that the share of commerce transacted online is starting from a low base in Indonesia, it is likely Internet expenditure will continue to outpace aggregate economic activity by a large margin.

Chart 4.5: Expenditure index: Spending on Internet access and devices



Source: Gartner Inc. and Business Monitor International (BMI).

4.3 Potential for growth and inclusion

There are good reasons to believe that the use of the Internet will grow quickly as more and more Indonesian households, businesses and government take advantage of the opportunities provided by the web

Increased penetration brings with it network effects that increase the value of the Internet to everyone online, even in the remotest corners of the Archipelago. Indonesia's investment in broadband infrastructure will increase use and reach of the Internet and help Indonesia to catch up in activities where it is lagging behind comparable countries, such as shopping online and adoption of Internet use by SMEs. Importantly, mobile Internet has the potential to transform the lives of less affluent members of Indonesian society by providing them with affordable access to the web.

Growth in the size of the Internet economy can occur in two ways, namely:

- Through increased access to the Internet
- Increased uptake of services and intensity of use of the Internet.

Several factors affect either access or use or both and therefore the growth of the Internet economy, including:

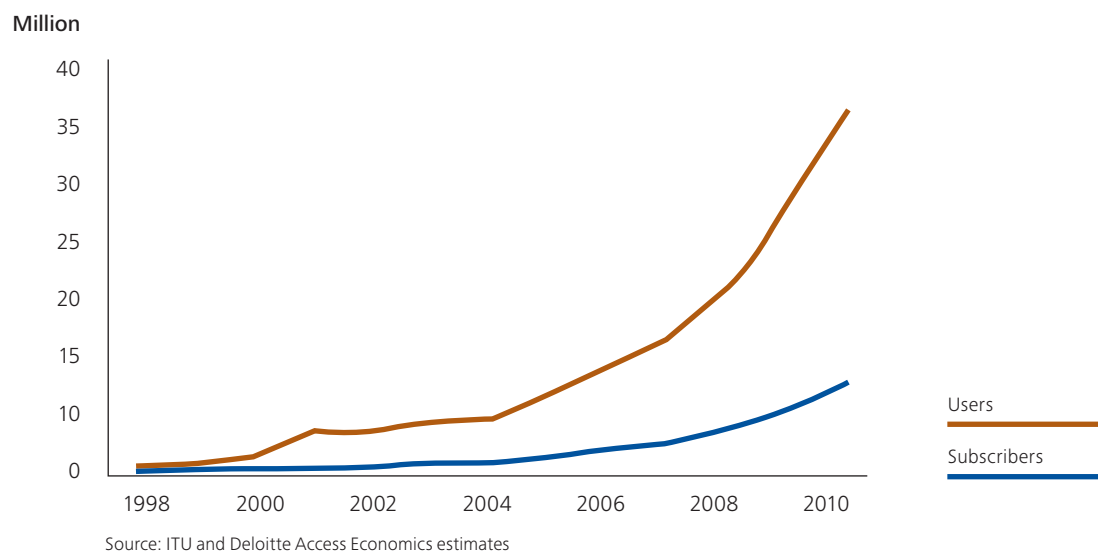
- Improvements in infrastructure as carriers need to be able to increase capacity to support the growth in the use of the internet
- Transformations in how businesses and governments use the internet to engage with suppliers, employees and customers, including through greater reliance on online commerce
- Acceptance by consumers of the use of the internet in their daily lives including through increased confidence in the security of the payments systems and privacy which increases willingness to spend online
- Improvements in embedded internet functionality as the internet becomes more pervasive with the rise of machine-to-machine connectivity.

4.3.1 Household access

It is likely that the number of Indonesian households with access to the Internet will double over the next five years, increasing the value of the Internet economy by around Rp 130 trillion (US\$ 15.0 billion) or 1% of GDP

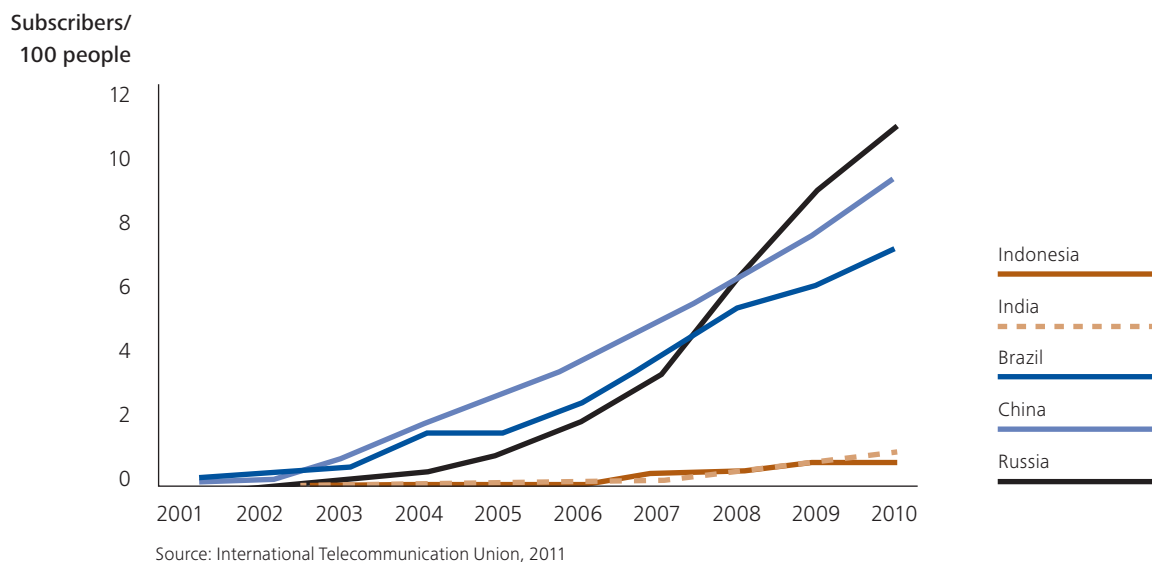
The number of Internet users has snowballed since 2006, when mobile broadband was launched in Indonesia (Chart 4.6).

Chart 4.6: Internet users and subscribers in Indonesia



The number of fixed broadband subscribers increased from 15,000 in 2001 to an estimated 1.9 million in 2010, growing at an average rate of 171%. The number of fixed broadband subscriptions is comparatively low, at less than one per 100 people in 2010. This is on par with India, but lagging other large developing countries (Chart 4.7). In comparison, penetration rates are around 20% in advanced economies.

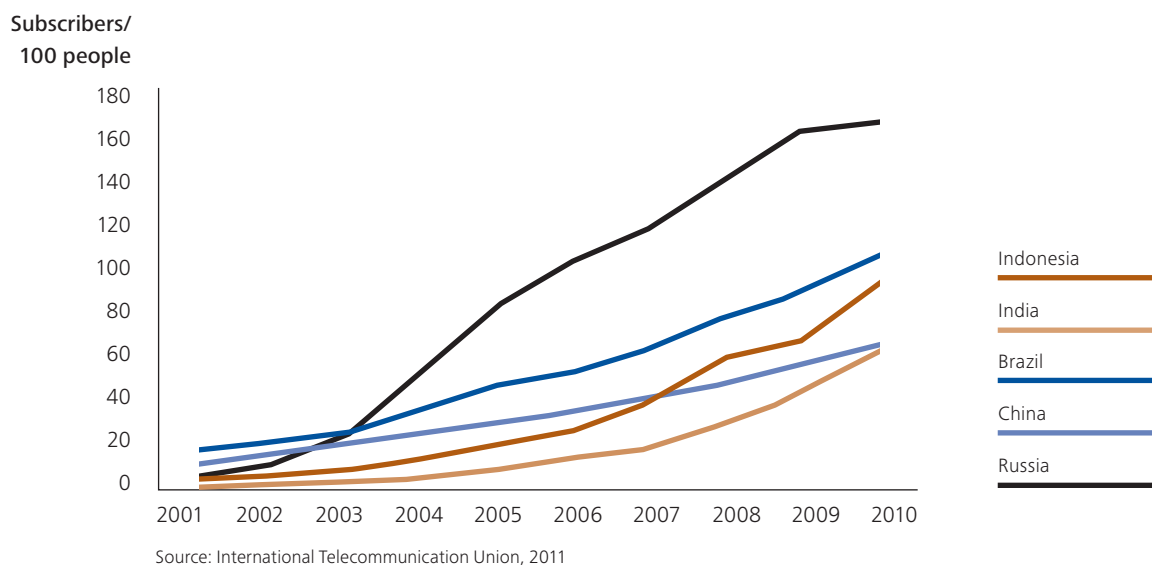
Chart 4.7: Fixed broadband penetration



A vastly different picture emerges for mobile broadband. Indonesia has 92 handsets per 100 people. On these figures, Indonesia rates well against comparable countries (Chart 4.8).²

The 3G subscriber base is estimated to have increased from 2 million in 2006 to as much as 33.8 million in 2010, indicating that mobile broadband use is also likely to have grown rapidly (Moedjono 2009).

Chart 4.8: Mobile phone penetration



² These figures are not adjusted for individuals owning multiple handsets. The proportion of the total population who used a mobile broadband handset in 2010 is estimated to be as low as 27% (ITU).

Within an international context, Indonesia's internet use is relatively low. This suggests that, over time, there is considerable scope for Internet usage to grow in Indonesia.

For the four million households with access to fibre to the curb, uptake in 2010 is estimated to be a little below 50%. One of the Government's Indonesian Information Society 2015 (IIS-2015) targets is to pass 15 million households by 2015. Even using conservative assumptions about the rate of uptake indicates the number of households with fixed Internet access could triple over the next five years.

In Java and areas with DSL access, copper is being replaced with fibre. The high price of copper makes this an attractive proposition for the companies that win the contracts, and keeps the cost to government low. This is good because the submarine cables replacing satellite on the islands are six times more expensive than terrestrial cables. In all more than US\$1.5 billion is being spent on the 35,000 km backbone network, with 32,800 villages covered. When completed in 2015, more than 38,000 villages will be covered.

Meanwhile, the rapid expansion of the use of mobile broadband is set to continue. Improvements in technology and cheaper handsets are expected to result in a large scale switch from older technologies to broadband-enabled phones in the next one to three years. If the roughly 2:1 dominance of 2G handsets is reversed, there could be another 70 million mobile broadband-capable handsets in use by 2015.

At the same time, falling tariffs will bring Internet access within the grasp of more Indonesians. The price of broadband services has kept them out of reach of many people. However, the universal experience in other countries is that as demand for services and volumes of traffic rise, prices can fall quite rapidly.

A related question mark that hangs over take-up of mobile broadband is the matter of what mechanism can swiftly bring down tariffs to a tipping point that precedes mass adoption by Indonesians. For fixed broadband, users are comfortable with the idea of advertising appearing on their computer screen having grown accustomed to it on television. This high tolerance of advertising enables costs to be borne by advertisers as opposed to Internet users. In turn, the inexpensive or free content provided to Internet users increases the demand for services and volumes, allowing ISPs to reduce unit costs and making fixed broadband more affordable for potential customers.

Mobile phones are perceived in a different way, valued for privacy, security – Blackberry's popularity in part rests with the belief it cannot be hacked – and the capacity to block callers. However, personalised advertising, based on the user's location, with interruptions targeted at the mobile user's shopping history has been an effective way to advertise on mobile phones in advanced countries.

The combination of extending the Internet infrastructure backbone to the eastern provinces and expanding wireless Internet will enable business and governments to make greater use of the Internet in their relationships with customers. This will attract more households and SMEs to the Internet. Given the expansion in infrastructure underway and increasing penetration, the upcoming decade will host a substantial increase in Internet use especially through mobile devices. A doubling of the number of Indonesians with access to the Internet is possible in the next five years.

4.3.2 Intensity of use

The use of the Internet will grow as the range of services and applications on offer increases. Social commerce, basic financial services and government services such as education are in the first wave and these will be followed in due course by changing business models. This will be facilitated by greater speeds and wider coverage.

The Government's targets for IIS-2015 are:

- Connecting villages, secondary schools, universities and colleges, health centres, local and central government with ICT
- Adapting ICT into primary and secondary school curriculum
- Encouraging content development and local languages.

This will increase online engagement with government and between central and outer regions.

E-commerce is in its infancy in Indonesia and low average incomes will slow monetisation of online opportunities. However, social networking is already being used as a marketing tool for sellers. Sellers already proliferate on Facebook, seeking to leverage recommendations of friends and family to help them influence potential buyers. This strategy is proving especially effective for purveyors of fashionable items, especially aimed at youth markets. Concerns about safety of payments and privacy are real obstacles, but can be overcome in time as familiarity with online shopping increases.

Nonetheless, there is clearly an appetite for online shopping. A survey of Indonesian Internet users found that 50% had visited retail sites in 2010, compared to 41% in 2009. Interestingly, three of the top five sites visited were Indonesian – Indonet.co.id, bhinneka.com and smadav.net (comScore 2011).

After persuading consumers to shop online, other challenges remain. Logistics in Indonesia is notoriously slow and the task of getting the goods from the seller to the buyer also needs to be addressed. Introducing affordable cloud-computing solutions to supply chain management holds promise, but may take a decade or more to implement to a level that is effective nationally.

Increased use of 3G and smart mobile devices, with faster speeds suggest that the value of e-commerce and e-government services used will expand dramatically.

Meanwhile, the extent to which businesses capitalise on the Internet, will be heavily influenced by the customer base. For example, online auctions to win tenders are increasingly being adopted by large corporate such as PT Telkom and Shell. To win these tenders, bidders need Internet access. It is expected that more and more SMEs will need to adapt to B2B to flourish.

4.3.3 Advance on all fronts but uneven

It is conceivable that Internet development in Indonesia will occur along a number of fronts, driven by youth's appetite for technology and fashionable consumer goods; business driven take-up of Internet interfaces especially for B2B; and the expansion of mobile Internet that may see many Indonesians leapfrog fixed broadband to advanced mobile applications in the future.

The arguments presented in this chapter suggest that over the remainder of the decade both access to and intensity of use of the Internet in Indonesia will increase substantially. This intuition is guided by the following reasoning:

- Indonesian government investment in the completion of the backbone and IIS-2015 targets
- The appetite of youth for internet technology and education about online opportunities

- Business setting the pace, encouraging potential b2b partners and b2c competitors to follow
- The popularity and cost effectiveness of mobile solutions
- Demand for essential services that were not available previously, including basic banking and money transfer, government services such as health and education, latest news and weather forecasts and social networks
- Readily available technology, with millions of internet-capable handsets ready to switch onto internet the instant data tariffs fall
- Indonesia starting from a comparably low point providing scope for fast growth in the future.

In line with the trends highlighted in the indexes in preceding sections, the value of the contribution of the Internet to the Indonesian economy is projected to increase from 1.6% of GDP in 2011 to 2.5% of GDP over the next five years, based on the following calculations in Figure 4.1.

Figure 4.1: Internet arithmetic

To go from 1.6% to 2.5% in five years implies growth of around 16% in the Internet economy if GDP growth averages 6% (or 17% based on 7% GDP growth).

The extent of the increase in Internet activity seems possible, based on:

- The recent large falls in the price of relevant Tevices (smart phones, notebooks etc)
- The recent trends in the indicators of access, use and expenditure
- The forecast growth rates for the economy and hence incomes.

The net impact on economic growth may be a bit less because imports will rise faster although, even with imports, there is some domestic component.

Conceptually, use of devices should be increasing by more than the spending on the ICT investments. That is, Indonesians are moving from voice and text onto smart devices or computers, and doing this from a low base.

Against this, the implied 17% or so growth in the Internet economy over coming years seems quite reasonable, perhaps a bit conservative if the overall economy is to average growth of 6% to 7%.

There are obstacles to the spread of the Internet in Indonesia in the form of capacity constraints and affordability that will take time to overcome. Yet, the country is well placed to take advantage of the potential of the Internet to deliver sustained improvements in economic welfare.

Moreover, by improving the flow of information and ideas throughout the Archipelago, the digital economy will serve both commerce and the community.

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Appendix A

Calculating the contribution of the Internet

This methodology uses an expenditure approach to add up the amount of Internet-related spending by households, businesses, government and international consumers on goods and services produced in Indonesia. The scope adopted by BCG in their report on the impact of the Internet in the UK is replicated for the Indonesian context to ensure comparability.

Consumption: Includes online spending and spending on accessing the Internet – both ISP data charges and a proportion of spending on interface devices such as computers and mobile phones.

Investment: Includes spending by business and government on telecommunications investment, a proportion of business and government spending on computer software, computers and peripheral investment, and investment in telecommunications equipment.

Net exports: Net exports of e-commerce and ICT equipment.

Data sources are IMF, OECD, Deloitte Access Economics, Gartner, Budde, World Bank, Statistics Indonesia.

Appendix B

Ahead in the clouds

The United States Government's National Institute of Standards and Technology defines cloud computing as an ICT sourcing and delivery model for enabling convenient, on-demand network access to a shared pool of configurable computing resources (eg. networks, servers, storage, applications and services) that can be rapidly provisioned and released with minimal management effort or service provider interaction.

Essentially, cloud computing allows users to store information, software and shared resources in data centres on remote servers which are accessible via the Internet. This circumvents the need to connect to a physical ICT network with any device that can connect to the Internet able to access the services and files.

Benefits of cloud computing

Cloud computing offers a number of benefits to organisations, in terms of simplicity, cost, flexibility and pace of innovation. This is particularly true for small businesses that may not have the resources and capacity to manage own data centres like larger businesses. The benefits of cloud computing include:

Cost – Businesses are not required to invest in high-cost IT equipment and maintenance to operate their own data centres and a physical ICT network as the information can now be stored on remote servers operated by a third party providing the cloud computing service. This also results in reduced operating costs including through reduced energy consumption, less expense in managing IT systems, less cost and complexity in doing routine computing tasks as well as more intensive problems, and potentially reduced costs associated with time delays.

Efficiency – By relocating their IT operational activities, organisations can focus on their core business operations, as well as taking advantage of creating applications that were technically or economically feasible without the use of cloud services.

Scalability – Organisations have an unconstrained capacity that is not limited by their physical IT resources, and this option of scalability is provided without serious financial investments in infrastructure and maintenance, with the provisioning and implementation undertaken on demand.

Flexibility – Cloud computing is functional faster than other IT systems and there is no need to install additional hardware or software, while implementation can be undertaken remotely, so that services can respond more quickly to changing business requirements.

Resilience – There is reduced potential for failure in a highly resilient computing environment as the failure of one part of the system may have little or no impact on the overall information availability and reduce the risk of downtime.

Pace of innovation – As technology is being constantly updated, organisations can access the latest technology through software applications being automatically updated by the cloud service providers.

Availability – There is greater availability of shared information that enables real-time collaboration at a global level.

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