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**INTERNET GOVERNANCE:
ROLE OF STATE AND SOCIETY**

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Internet Governance: Role of State and Society

1 Introduction

Governance refers to the system for effective management and implementation of decisions and policies in a nation's affairs. Political governance is the exercise of political power to manage affairs in the nation which is distinguished from the government as the political body making the decisions and policies in the country. Managing a nation's affairs require economic resources, making politics inevitable. The World Bank (1991) has put governance as the manner in which power is exercised in the management of a country's economic and social resources for development, definition designed to extend beyond the capacity of public sector management to rules and institutions. Thus, other levels of governance as in corporate governance, matter.

Good governance is intellectually complex (Root, 1996, p145) as leadership must be balanced with institutions. Accountability is achieved by autonomy, transparency is by respect for propriety nature of information and democracy is by meritocracy. When economic management is invoked, criteria of efficiency and effectiveness have to be applied to governance. But public policy making is strictly not economics and politics is hard to ascertain under socio-political or political economy constructs. Good governance featuring alternative modes and means of organisation becomes a framework to assess efficacy and integrity of institutions. Neither can good governance and good government be divorced from ideology, culture and values.

Governance is entering another paradigm created by the Copernican revolution in information communication technology (ICT) and Internet-based connectivity which is beyond the technology and technical frontiers. From the overview of the new economy in Section 2, the implications and issues arising from Internet governance identified in Section 3 are enormous and wide-ranging. The discussion lend credence to the main thesis of this paper that the state alone cannot be wholly and comprehensively responsible for good governance as defined. We put forth the Singapore case-study in Section 4 to illustrate this proposition even if a stronger and visible hand of the state is traditionally perceived in Singapore. But the private sector and society at large have become partners with the state in harnessing ICT and Internet to bring about the greatest good for the greatest number of people in an interconnected, globalised world. Beyond productivity and efficiency, a higher quality of life and sustainable development must remain the ultimate outcome and goal of any technology cycle. We conclude in Section 5 with further prospects of Internet governance in Asia.

2 What is and how large is the new economy

Since the 1990s, information and communication technology has been making significant impact on the way economic activities and exchanges have been taking place and it is not just about convenience and saving time translated into productivity and efficiency. New, usually high technology industries have evolved reengineering production and business processes from the factories all the way down to retail level. A cluster of information industries revolving around the generating, collation, processing, distribution and storage of information in the public and private sectors have given rise to a quarternary sector. There is a shift from material and resource-

based production as in the traditional primary (agriculture, forestry, fishing, minerals and oil) and secondary (construction, utilities and manufacturing) to a knowledge-based economy where intellectual capital is the ingredient.

Depicting application of creative, innovative and problem-solving skills, knowledge-based industries make even tertiary sector (finance, banking, communication, telecommunication, transportation, travel and other community and social services) inadequate in coverage and scope. The new revolution involves microelectronics, computers, telecommunication, designer materials, robotics, biotechnology and two levels of knowledge. Knowledge creation requires highly educated creative skills at very top of skill distribution while knowledge deployment requires widespread high quality skills and education in middle and bottom of skill distribution. The growth of the knowledge-based economy (KBE) involving high-technology industries, Internet, electronic business and all things with information technology is unfathomably deep and wide that nothing humans do will ever be the same.

A new economy is definitely evolving but the precise definition and nature of what that entails is still ill-defined, alluding to the wave of the future as in a knowledge-based economy, promising high-paying, high-technology jobs. It would involve intellectual capital which resides with professionals and skilled workers more than physical capital as in building and machines alone. Images of such technology and knowledge centres as in Massachusetts and California in the United States and measures such as patent filings, scientific manpower, research and development (R&D) spending per capita are conjured.

Moving away from land and resource-based and manufacturing production, wealth is created out of ideas commercialised and protected by copyrights or patents. Products can be ephemeral ranging from software programmes to short-lived hit songs, or fundamental as in drug discovery, biotechnology and aerospace, all based on the new raw material of brainpower. Centres of the new economy tend to cluster around research institutes or universities which create the pool of knowledge workers who fuel innovation and foster willingness to change, adapt and take risks. Cities and their surrounding suburbs constitute basic units of new economy.

Analysis of the competitive advantage of the new economy includes average education levels of workforce, number of fast growing companies, new public companies, "innovative potential" such as patents filed, number of research scientists and engineers (RSEs) and R&D spending and even culture of risk-taking and rapid change. Even an apparent political disconnect between the new economy and government institutions is perceived as factors hospitable to the new economy are so subtle and complex that the government has limited powers to lure and sustain desirable industries. Overly active government intervention and public policy may be counterproductive as more than tax and other incentives, education and promoting job-specific training programmes to grow knowledge-based industries, are necessary.

US Department of Commerce, The Emerging Digital Economy II, June 1999 followed the first report released in 1998 and the Department intends to issue an annual report henceforth, demonstrating the importance of the emerging digital economy and how it should be tracked and monitored. Initial forecasts of its impact are already being superseded. The second report projects that by 2006, almost half of the American workforce will be employed in industries that are either big producers or intensive users of information technology. Software companies currently employing more than 800,000 people will have employment in the industry grow by 13% a year compared to 2.5% in rest of private economy. Making a distinction

between Internet economy revenues and high-technology revenues which include non-Internet business activities, the Internet economy has an estimated revenue of US\$301,393 million and 1,203,799 jobs.

The US Census Bureau will be measuring the dollar value of e-commerce sales in its next Annual Survey of Retail Trade. It has implemented a new system for classifying industries and economic activities which includes extensive and detailed coverage of the information sector and international indicators are being developed with foreign counterparts.

Internet economy indicators created by the University of Texas are built on four layers: Internet infrastructure, Internet applications, Internet intermediary and Internet commerce. Internet infrastructure comprises Internet backbone, Internet service providers, networking hardware and software companies, personal computer and server manufacturers, security vendors, fibre optic makers. Internet applications include Internet consultants, Internet commerce applications, multimedia applications, Web development software, search engine software, online training, web-enabled databases. Internet intermediary is made up of market makers in vertical industries, online travel agents, online brokerages, content aggregators, portals/content providers, internet advertisement brokers, online advertising. Internet commerce comprises e-retailers, manufacturers selling online, fee/subscription-based companies, airlines selling online tickets, online entertainment and professional services. Internet commerce supports the largest number of jobs (40%) followed by Internet infrastructure (38%) but their respective shares to total Internet revenues are 31% and 33% respectively, with the other two components quite evenly matched.

Information and data capture via electronic means is only one but very obvious effect of the new economy with the new ways and modes that production and business are conducted are being revolutionised. Paperless and more direct measures may be implied but intangible over-the-wire forms of transactions can be as evasive and difficult to track, making indirect means and more innovative measures necessary. Crossborder transactions, for instance, face fundamental issues like source and origin of transactions much as they ultimately benefit the technology savvy consumers which has the global markets for their selection both to lower costs and add variety. The labour market is no less affected by Internet-based commerce in terms of trends in employment demand, wages and skill requirements. Increasingly, the workforce will be employed either by industries that produce IT equipment or services or by industries that are heavy users of IT equipment or services. Core IT workers are computer scientists, engineers, programmers and systems analysts. New IT occupations, changed skill requirements for some non-IT occupations and higher minimum skill requirements for many lower skilled jobs come with expanded Internet usage and e-commerce accompanies by wage growth.

A “churning” effect of employment gains and losses among IT industries and occupations as same innovations in computing and telecommunications technologies that are rapidly creating jobs in some industries are causing jobs to be lost elsewhere. New occupations are created, others redefined. Need for continuing education and worker retraining, need to be multi-skilled and commit to lifetime learning and retraining to remain employable rather than just employed. Labour market imbalances have to be solved not by higher wages but also non-salary requests (as in alternative work schedules, telecommuting, child and elder care assistance, pets in workplaces) to attract and retain workers needed.

The IT revolution has creatively destroyed jobs which may reconcile with productivity figures. One possibility is that firms have to wire up to preserve or

extend their share of the market but are not in the end producing all that much extra output from given inputs. In other words, radical change in a competitive economy need not yield commensurate improvements in economy-wide productivity. The highest productivity applications of computers are already in place so that economy is now quite far along the path of diminishing returns. Or it may be that the IT revolution will never come close to matching significance of earlier innovations as in the internal combustion engine and electricity which gave rise to entirely new final goods, as opposed to redistributing advertisements from newspapers to Internet or reducing lead-times in supply chains. Low inflation and low unemployment may be no more than due to strong dollar, cheap commodities, strength of Wall Street despite its fickleness and cyclical weakness outside of US and a host of traditional factors.

Internet-based commerce has transformed the way the US does business and revealed new opportunities for companies to reduce costs such that Wall Street has soared to new heights in recognising these. It has also brought out a couple of economic paradoxes. First, falling prices of IT goods helped the decline in overall inflation which has been accompanied by the lowest unemployment in a generation in the US. Economists are, however, puzzled because as gross product originating or value added per worker (GPO/W) in IT-producing goods industries has been extraordinarily rapid, that in IT-using industries has declined despite massive IT investments. The apparent paradox has been suspected to be partly due to a lag in productive applications of new technologies and partly to problems of measurement.

A second paradox is that the US economy grew faster without risk of inflation and achieved very low unemployment as well. While it seems ludicrous to question it, the trend appears to have reversed the slowdown in productivity since the 1970s. Value added per worker in US IT-producing industries grew at an annual average of 10.4% in the 1990s, far higher than rest of economy. Robert Gordon of Northwestern University (unpublished, <http>) found that more than 100% of the acceleration in productivity since 1995 happened not across the economy as a whole, nor even across IT at large, but in computer manufacturing, barely 1% of the economy. Elsewhere, productivity has stagnated or fallen.

Two facets of the digital economy are e-commerce (business processes which shift transactions to the Internet or some non-proprietary, Web-based system) and the IT industries. More significant than the dollar value of e-commerce transactions are the new business processes e-commerce enables and the new business models it is generating in an effort to lower costs, improve customer service and increase productivity, driven as much by customer demand and business imperatives. Internet became a business tool in 1995 and now, e-commerce which will affect traditional ways by telephone, mail, facsimile, proprietary data interchange systems or face-to-face contact. Starting with the infrastructure, an increasingly wired world and Internet access is demonstrated by the rising number of web users world-wide, new web address registrations and percentage of population with Internet access at home or at work.

A more critical implication is that while standard definitions of e-commerce still being established, developments are running ahead of taxonomy. Current market research only estimates aggregate online retail trade generally to include only those transactions ordered and paid for online. The government has to develop new measures, improve price indexes, new estimates of software investment and capital stock to reflect importance of growing importance of high-technology equipment. But IT producing industries are producers of computer hardware and software,

communications equipment and services and instruments, blurring the traditional between goods and services.

Measuring service industry performance has problems on both the output and input sides. Service outputs are hard to define and even harder to measure in part because of heterogeneity of outputs. Netting out value of inputs for a gross product originating (GPO) measure is another challenge. The problems of mismeasured service output are mitigated by taking into account of the fact that many of these industries (business services, legal, accounting) are producing intermediate services sold to others. To extent intermediate purchases are mismeasured, error affects the allocation of output among industries, that is, too little output growth may be attributed to service sector and too much may be attributed to manufacturing. GDP is affected by service sector mismeasurement only to extent that their output represents deliveries to final demand like consumption, investments or net exports.

Other public policy affects the willingness to conduct business online which is influenced by a variety of factors. The negative ones include privacy and security of credit card purchases, political and regulatory issues, cost of Internet access. The facilitating ones include the flat pricing structure of local residential telephone calls and flat monthly fee for Internet providers. Other determining factors include the availability and cost of broadcast access and increased private investment in high-speed networks will facilitate distribution of information, particularly bandwidth-intensive applications which use graphic and video.

Deregulation of telecommunications would lower prices and translate into increased e-commerce activity. As global markets increase and become borderless, international and regional organisations must work with sovereign government to set policies which will not hinder Internet development. A framework for global e-commerce espouses private sector leadership, avoidance of undue restrictions, establishment of a legal environment based on a contractual model of law, recognition of the unique qualities of Internet and facilitation of global e-commerce.

Businesses use e-commerce to develop competitive advantages by providing more useful information. Expanding choice, developing new services, streamlining purchasing processes and lowering costs. Internet also imposes price discipline as customers have access to price and product information from many sources. Retail e-commerce is changing cost structures more than alternative shopping sites to real-world stores, expand existing ones and create new ones. Business-to-business e-commerce enjoy same advantages, creating new relationships, streamline and augment supply chain processes, changing roles of logistics and financial intermediaries like FedEx, UPS, American Express.

New classes of business intermediaries are spawned: aggregators, auctions and exchanges. Aggregators create a business community, they pool supplier content to create a searchable one-stop shopping mall with predefined prices for buyers within a business community. Auctions create markets and reduce sellers' losses as they pit buyers against each other to reduce seller surplus and buyers and sellers participate in multiple, real-time auctions simultaneously without accruing physical-world search and travel costs. Exchanges create stable online trading markets as vetted players have a trading venue defined by clear rules, industry-wide pricing and open market information operating at a fraction of physical-world cost.

Relative pace and speed of economic development which in turn impinges on the geopolitical economy and balance of power is another result of Internet-based economies. Proceeding from e-commerce to e-business (business-to-business), the US for instance, will reach a threshold from which it will accelerate to "hypergrowth".

US inter-company trade of goods, excluding services over Internet will double every year over the next five years, surging from US\$43 billion in 1998 to US\$1.3 trillion by 2003 (The Economist, 26 June 1999). By contrast, business-to-consumer e-commerce over the same period, rising from US\$80 billion to US\$108 billion is more modest. The UK and Germany will follow the US into hyper growth stage of e-business two years later, followed by Japan, France Italy another two years later. Industries will be affected at different speeds depending on mainly on competition they are exposed to get on the network.

At the micro level, firms have experienced outsourcing, downsizing and re-engineering with packaged IT applications which automate internal processes. They managed supply chains known collectively as on "enterprise resource planning" (ERP), they have adopted low cost, flexible but isolationist and inward-looking personal computer-based client/server computing since the 1990s. By contrast the Internet features communicating, connecting and transacting with the outside world just as corporate extranet allows firms to organise production and delivery to serve customers smoothly by plugging its suppliers directly into customer database, matching supply with demand., a fully integrated value chain.

Internet's universal connectivity enables three-way information partnership as value chain integration is defined as a process of collaboration which optimises all internal and external activities involved in delivering greater perceived value to the ultimate customer. Before Internet, companies struggled to improve on speed and supply-chain interactions as in electronic data interchange (EDI) which is purely informational and expensive without incorporating changing market conditions dynamically. Based on proprietary technologies rather than open standards, suppliers and customers are locked together. Moreover, as a business-to-business tool, the end-user is excluded from the value chain. Interconnectivity is what Internet promises, a quantum leap with intranet (inside the organisation) and extranet (outside in open, public) with value-added features and network and more.

The new paradigm requires an equally crucial shift in thinking. Business is no longer about a free-standing entity as e-business hubs grow from big companies and small ones become the spokes. Suppliers and customers are brought together and deeper understanding of all business partners' processes with the openness and transparency implied requires new ways to strategise and compete. Behaviour and nature of business inevitably change, supply and demand becomes more dynamically linked, responsive and customised.

Internet is creating new businesses especially in services not just serving to deliver the desired products directly but the linkage of products and services under a brand umbrella create so much convenience and efficiency that more transactions in volume and value are generated over and above productivity. Purchasing an airline ticket is only the beginning as information of things to do at particular destinations increase and multiply creatively and imaginatively as dynamic traders to offer a total package to satisfied customers. Transaction costs are lowered, erasing differences in scale economies and allow smaller companies to be more competitive. Instant information and the dynamic process make everything just-in-time, from e-bidding to e-auction as more markets go online. There may be as much stress and bewilderment if the human mind and fingers cannot click as fast as the electronics.

A Copernican revolution puts consumer at active centre of business universe as enterprises find their core competencies by understanding revealed preferences of customers through the Internet in "coopting customer competence" (IHT 10 Feb 2000). The product is no more than an artifact around which customers have

experiences and the company only makes the product but cannot dictate customer experience. The Internet makes it possible to reach the customers and get their response and feedback and together through engaging experience, companies use customers' talents shape their expectations and encourage communities to form around the product. Having absorbed such customers' knowledge of the product through such articulation, better products emerge. Consumer communities provide the bottom-up equivalence from the demand side like shopfloor experience and suggestion at the supply side. Customer diversity is managed better by gearing a product to various skill levels, personalise the customer's experience to the extent possible. In any case, customers do the data entry at websites which amplifies experiences, articulates communication powerfully.

In the business of e-commerce, e-trade, e-trade and all that is electronically possible, the economics of competition and business models are fast changing. Transaction costs are disappearing with disintermediation, making competitive auctions, a perfect market for the informed buyers and sellers a reality (The Economist, 12 February 2000, p 86). New market places promise greater accessibility and efficiency, multiplying into business-to-business e-hubs.

It is difficult to know whether there is disintermediation or more infomediary defined as intermediary which sells information about a market and create a platform for buyers and sellers, is created. More customer service is created to give advice on sites, how they perform and how to optimise buying plans even for the most savvy and not many are. New business models are emerging as the ways markets operate change (The Economist, 26 June 1999, p 21). Companies in the aggregator model, help customers in fragmented markets make choices by providing up-to-the-minute information on price and the product and a single contact point for service. The model for online auctioneers offer an informed and efficient match for suppliers of perishable or surplus products and buyers with an eye for bargain prices without taking a leap into the unknown. The model for exchanges create liquidity in formerly fragmented markets, lower average stock levels as bids and offers are effectively matched, acting as neutral third parties enforcing market's offer rules and settlement terms. Hybrids are spawned as aggregators and auctioneers merge, the objective being to consolidate fragmented markets either by geography or lack of dominant firms closing up space and gaps. Infomediaries are not just for consumers (Yahoo, Amazon.com and e-Bay) but more profitably for business-to-business intermediaries which help reorganise entire industries and businesses.

Infomediaries powered by Internet enables the return to consumer sovereignty as power is shifted from sellers to buyers by reducing cost of switching suppliers and free and perfect information is returned as this assumption of perfect competition has been stolen by the existence of transaction costs in real life. Moreover, the intermediary can offer neutral, disinterested advice as it has no vested interest. Further cuts in transaction costs as payment and processing are integrated and expedited for all sizes of firms. Speed, range and accessibility as can be offered by IT and communication technology creates new business opportunities and possibilities. The virtuous circle created by infomediaries gets larger and more competitive as they will also have to focus and specialise to create customer satisfaction and loyalty. Ironically, Internet created the infomediary as an intermediary business model instead of merely disintermediation as thought. But any re-intermediation must add value, be it more information, time and cost saving or whatever buyers feel they are willing to pay for.

Tables 1 and 2 only give a glimpse of the impact of Internet in major regions in the world and the extent, magnitude and depth accompanied by qualitative changes in life are yet to be conceptualised and quantified.

Table 1 Percentage of people with Internet access by region, May 1999

	People million	Percentage
US & Canada	97.0	56.6
Europe	40.1	23.4
Asia Pacific	27.0	15.8
Latin America	5.3	3.1
Africa	1.1	0.6
Middle East	0.9	0.5
Total	171.0	100.0

Source: US Department of Commerce, The Emerging Digital Economy II, June 1999.

Table 2 Percentage of population with Internet access at home or at work, 1998

US	37
Canada	36
Nordics	33
Australia	31
UK	15
Germany	10
Japan	10
France	8

Source: US Department of Commerce, The Emerging Digital Economy II, June 1999.

3 Implications and issues of Internet governance

Any of the many trends and developments identified above can have profound implications on governance. As much as Internet connects, a political disconnect between the new economy and government institutions may arise. There is need for a middle ground between liberal impulse to defend the bureaucratic status quo and the conservative bid to dismantle the government machinery perceived as constraining Internet governance. Factors hospitable to the new economy are so subtle and complex that the government has limited powers to lure and sustain desirable industries. Overly active government intervention and public policy may be counter productive. The traditional hunter-gatherer style armed with tax breaks, land and other incentives to recruit target companies may change to cultivating fertile states and regions to grow knowledge-based industries by improving education or promoting job-specific training programmes.

New politics are spawned by the new economy if more jobs are created in Texas due to new technology than in oil and gas extraction (Asian Wall Street Journal, 1 September 1999). Across the US, resulting changes in workplace arrangements, cultural attitudes and lifestyles are creating new opportunities and new problems. Rootless politics of the new generation, explosive growth in small businesses as exemplified by the spiralling growth in technology stocks, a constituency which is both compassionate and anti-bureaucratic, with ideology in flux are some of emerging trends. The rest of the world will sooner or later be faced with the same challenges.

This new political culture resulting from Internet governance affects taxation and legal matters. Tax and customs authorities may, however, be frustrated as activities become seamless and paper trails are replaced by electronic ones and issues involving legal, jurisdiction and jurisprudence, arise. Even if one may dismiss any revenue loss from the impossibility of difficulty of collecting taxes over the virtual market place and aim to collect other forms of taxes on individuals and corporations, other issues emerge. One may ask who is at the various ends of the transaction, how is accountability and responsibility divided and shared?

What are the psychological, sociological and emotional costs of such a paradigm? Do people get more interconnectivity with machines and technology, cold and clinical with fellow beings, especially those whom they cannot communicate or relate to if they are "electronic-fied" or are at various speeds and pace? Would standard language and etiquette suffer as e-mails are already in such computing terms and forms and generating a new protocol? Are net transactions substituting people relationships and what ever time and cost saved are basically returned to hardware and software as there are always new and upgraded technology and learning curves never bottoms out as new ones arrive.

As much as artificial intelligence is invented and programmed by smart human beings, the lesser mortal users are still humans trying to cope with what technology is supposedly offering. There may well be disintermediation as buyers and sellers are in direct contact, cutting out the wholesalers and retailers for certain products. But with information overload and disparity in accessibility and computer and information literacy among customers and users of e-commerce, new scope for intermediation may also arise.

Similar to consumers' worry about security and privacy of transactions in the new economy, policy-makers and statisticians are as concerned with the consistency, accuracy and reliability of data band statistics generated and collated by electronic means. Technology is often a double-edged sword and it can be put to welfare-generating purposes as to fraudulent and misguided uses. It takes as savvy a bureaucracy as the market and private entrepreneurs to ensure the traditional roles and functions of statistics is not compromised or shortchanged in any way. The singular objective of a good statistical system remains to portray and measure the economy as accurately, consistently and timely as possible to provide indicators for policy making in both the immediate and long term. Users of electronic means in the private economy should appreciate the ultimate destination of information they provides and at some point, they are also users of the same data and information provided by the statistical system to help them map their economic decisions.

Accidents and mismanagement which are still human errors can occur as efficiently and quickly and even magnified and multiplied with powerful technology as in much feared systemic failures and the Y2K even if that seems averted. Wrong addresses, wrong destinations, blind copies or "carbon" copies and the equally dreaded as deceptively efficiently reply-all mode create instantaneous, irrevocable disasters which human beings must still explain, account or apologise for. Wilful attacks, hacking and abuse of privacy creates as many regrettable industries and professions and there is an ever churning of supply and demand as the cat-and-mouse game of regulators, police, law and justice and crime watchers try to contain and curb the adversaries.

Japanese government websites have attacked and defaced from foreign possibly American servers, leaving messages varying from insults to attacks on Japan's war-time history (Singapore Straits Times, 9 February 2000). A coordinated

attack of some 50 American websites including Datek Online, E*Trade, Yahoo, Amazon.com and e-Bay with “denial of service” (DOS) where aim was not so much to damage files or steal information but just to keep an Internet site from operating (Asian Wall Street Journal, 11-12 February 2000). The US government has promised more security checks for is posing as worrisome security threats.

Can we be over managed and over dictated by IT and machines and underdeveloped as sociable, human-friendly rather than user-friendly people? Are more unnatural cycles created defying the accepted and practised laws in economics, business, management, social behaviour, competition and authority? It is not that we are afraid of new inventions and phenomena but that some may defy understood and accepted moral and ethical codes. Even if anachronistic ones do have to go and make way, essentially human beings may need time and space to accommodate and adapt. But cycles are getting shorter and new rules and laws for social and human engagements are reinvented continuously, more than the human mind can take and absorb. Nature and simple natural things and pursuits become disdained as they may be deemed technological laggards.

Internet-based e-commerce has further implications in terms of generating a level playing field in international trade, affecting trade in services more profoundly than trade in services. In this connection the General Agreement on Trade in Services (GATS) and related regulatory reform and liberalisation are germane to the discussion. In particular, the General Agreement on Basic Telecommunication Services is generally supported by business users and new telecommunication providers who benefited from deregulation and competition and reinforced by solid legal structure. But business managers and lawyers are confused by the schedules and provisions, ill-informed debate by experts and complexity of disentangling trade protection, restrictive national regulation and pursuit of legitimate public goals in one fell swoop..

GATS is conceptually weak as barriers to trade in services are generally embedded in domestic regulations which are inherently non-transparent. Restrictions by nature tend to restrict trade by number of firms, employees and distribution outlets, services which can be sold, prices, marketing practices and distribution channels. The trade regime for services is more interwoven with labour mobility and foreign consumption than trade in goods. The resultant three-fold challenge in designing the trade regime is to remove discrimination in domestic regulations against services provided by foreign providers, deal with non-discriminatory regulations which restrict trade and deal with the four modes. These are crossborder, foreign consumption, sale of services through a foreign owned local establishment or commercial presence and provision of a service by resident of another country who has gained temporary entry or presence of natural persons.

The advent of e-mail needs a more precise definition of these four modes. Modes 1 and 2 are now blurred if service purchased through Internet. Mutual recognition agreement (MRA) becomes necessary to protect consumers. More complicated is location of ISP used by consumer who can access through another country. A solution to follow strictly the treatment of analog transactions involving more traditional methods of acquiring services or goods abroad except when it is not always clear where a service is produced and where is service provider located. An alternative is to let market sort out regulatory issues by allowing buyers and sellers to choose regulatory jurisdiction for transaction. Yet another possibility is a fifth mode for e-commerce on an opt-in bases by suppliers. Politically, private sector, especially

in US has mixed feelings about new regulatory rules and inclusion of e-commerce in the World Trade Organisation (WTO).

Global electronic commerce, that is, the production, advertising, sale and distribution of products via electronic networks requires the reform of GATS as is being examined under a WTO working group in many areas. The classification model in GATS2000 has three kinds of transmission; electronic transmissions which consist solely of telecommunication as in e-mail and internet telephony, those for ordering goods as in books and those in which whole process is electronic like financial and legal advice which can still intersect. Taxation is another matter where WTO agreed in 1998 to temporarily not impose customs duties on electronic transmissions. This was echoed by Clinton in Seattle in 1999 and the US and EU have permanently extended this moratorium. More complex are intellectual property rights (IPR) issues regarding copyright, patent and trademark and even adequacy of definition of IPR in the electronic networking environment. Privacy and security, protection of availability, confidentiality and integrity of data which is stored and transmitted, digital watermark, signature, double-binded encryption, highly advanced cryptography which might threaten national security.

A legal governance issue raised by Internet revolves around the private choice of law which protects contracts and consumers. The EU places great emphasis on consumer protection and state's ability to circumvent private contract law. Consumer protection and choice of law are not mutually exclusive and EU believes mandatory laws which protect consumers also facilitate electronic commerce. But there is some deliberate effort to assert the primacy of consumer protection. The US seeks to facilitate electronic commerce mainly by ensuring traditional choice of law principles prevail on Internet. While there is no value judgement to be made at this juncture whether mandatory rules for consumer protection is good or bad, or any assertion that such laws would benefit e-commerce, any contention between these two perspectives would mean a need to come to some convergence for GATS.

4 Role of state and society: The Singapore case

Singapore had set its sights on IT to give relief to its small resource-scarce economy as early as after the 1985 recession. It is uniquely small, open and has remained resilient and successful first by a growth strategy relying on its labour and locational factors, upgrading to productivity and of late, entrepreneurship, technology and R&D-based growth strategies. This is facilitated immensely and necessarily by electronic highways, ICT and Internet-based connectivity. But it may prove to be more challenging and difficult both because of more intense competition all round and because creativity and innovativeness of the people are not as easy as physical infrastructure and whatever money or direct foreign investment (DFI) and multinational corporations (MNCs) can bring forth.

Building the intelligent city is not difficult as Singapore has both the financial resources and determined policy framework and management as well as attraction for the needed MNCs and expertise. Planning and implementing Singapore One Network for Everyone (Singapore ONE) is not hard as the government has the financial resources from prudent budgetary policies which accumulated surpluses for such infrastructural investment. There is neither physical, environmental and planning nor socio-political constraints and objections. With dense, high-rise public sector housing and equally high home ownership, wiring and cabling homes and offices in a highly literate urban setting has been relatively straightforward.

Singapore ONE introduced a 516 kbps-capacity broadband network in 1996, by far more comprehensive in coverage and ahead of other Asian states including Japan, the Multimedia Supercorridor (MSC) in Malaysia or Cyberport in Hong Kong. From an economic dimension, implanting the electronic highway and necessary information infrastructure is logical and consistent to its strategy to make reliable and efficient infrastructure and services together with human resource support. These together with good management and governance from the public sector to the private sector have been the defining parameters of Singapore's international competitiveness (World Competitiveness Report 1999 and Global Competitiveness Report 1999).

Singapore was named the inaugural Intelligent City of the Year in 1999 by the World Teleport Association and Telecommunications magazine (International Herald Tribune, 9 July 1999). It was easy to wire up a small, compact and comprehensive city-state, with strong links to the rest of the world through the multinational corporations (MNCs). Some 27 companies including Lucent Technologies, Honeywell and UPS Worldwide Logistics have set up regional headquarters in 1999. An American Chamber Commerce survey in Hong Kong reported that some 25% of corporate bases have moved out in 1999 to relocate in Singapore (International Herald Tribune, 9 July 1999). Singapore has a relatively high number of Internet users, some 500,000 to reach 900,000 by 2001 as a result of the 19-year push for IT literacy with 40.8% of households owning a personal computer by 1997.

But two attributes of the KBE are creativity and innovation and new ideas need new approaches and speed. With its characteristic style, Singapore has quickly resolved any socio-political aversion to wide open competition and reliance on more self-regulated censorship to embrace Internet to embrace the KBE unreservedly. The policy for foreign talents, revamping education and fostering continuous lifelong training and skills upgrading, encouraging technopreneurs and a high-technology R&D culture, complete liberalisation of the telecommunication sector and necessary reform in domestic regulation are all pragmatic responses. The successful implementation is as much reliant on the private sector, both domestic and foreign as the government and its agencies.

Moreover, it is an inevitable destiny that Singapore has but to embrace the KBE and all its portents as it cannot survive competitively as a mere city-state without also twining as a world city. This dual concept is the only way to ensure economic and political survival. It also implies that Singapore takes the challenges of globalisation as seriously and in tandem with regionalisation especially in the region proximate to the Association of Southeast Asian Nations (ASEAN).

Two approaches have to be simultaneously considered. First is the proposition that global e-venturers must set up in Singapore as a platform for innovation, host R&D and technology transfer. Second is the gateway to regional connectivity, help develop and nurture e-ASEAN, a concept of an interconnected online information highway mooted by prime minister Goh Chok Tong at the 1998 Hanoi Summit. This proposition is provide best network in region for investors to offer greater choice of business opportunities. Both approaches are equally important, the first for the intelligent city to be a world city as well, and the second to legitimise Singapore's position and role in the ASEAN region. It cannot go ahead to far and too fast of its ASEAN neighbours both for economic and business applications in IT and in terms of socio-political effects. While Malaysia is also aiming to be the regional node like Singapore, market forces and competitiveness will finally help MNCs decide where to locate their business and operations.

Education and awareness of the new economy in changing and shaping lives at work, homes, schools and other areas of human interactions is an unstated imperative much as efforts are expended in Singapore ONE network. The demographics of users, their needs and expectations must be taken into account much as policy-makers and statisticians want to use the new economy to expedite and collate information efficaciously. Assurance and understanding to put a human face to the new economy may seem unimportant in the head-on rush to embrace and marvel at new technology and all that it portends. People need time and space to overcome whatever residual blocks in their mindset as change is never easy nor welcomed much as they should be.

A well designed publicity and public relations exercise may be a necessary first step and active participation by private sector firms in the four layers of the Internet economy is imperative. As much as to give them the opportunity to promote and publicise their capabilities and products, the areas of cooperation and collaboration between them and with their users in terms of support, standard and quality would be established. More and more, interactive modalities of communication and information feeding back and forth becomes as necessary as they are desirable between the public and private sectors.

As a world trader in goods and services, Singapore cannot avoid or be bypassed by such technology and developments. Much as it recognise that head-on competition in a world of global connectivity is not necessarily the best answer and cooperative competition or cooptition is a wiser strategy, it has to accommodate what other the strategies and aspirations of proximate countries. The ASEAN, Asian Pacific Economic Cooperation (APEC) and WTO umbrellas are best for inducing such cooperation. Singapore have to play a larger and more visible role in all there regional and international fora, especially where IT and information polices are affected. No matter how well it manages its domestic factors, ICT and KBE have so much to do with externalities and external developments. This requires the government to deal with government-to-government matters at the institutional level. But the private sector as in business, the consumers as in society must pull their weight as Internet governance has empowered them with the means and rights.

Singapore's ambitious electronic commerce masterplan aspire for US\$2.3 billion worth of product sales and services transacted electronically and 50% of local business engaged in some form of e-commerce by 2003 (International Herald Tribune, 9 July 1999). The five thrusts in the development of an internationally linked e-infrastructure include jump-starting its hub position, encourage business to use e-commerce strategically, promote public and business use of e-commerce and harmonise cross border e-commerce laws and politics. Spearheaded by the National Computer Board (NCB), Singapore already has largest legal framework and comprehensive e-commerce infrastructure as well as necessary services and applications. NCB allocated US\$5.3 billion (S\$ 9 billion) to help 500 local enterprises integrate e-commerce into their operations. All key public services which can be electronically delivered will go online by 2001. Similarly, the Trade Development Board (TDB) has made Tradenet started in 1989 available on Internet in 1999 and traders are expected to save S\$2.8 billion.

The government's hand appears again in the form of the Economic Development Board's (EDB) Industry21 complementing the KBE. This calls for manufacturing and services sectors to develop a strong emphasis on technology, innovation and value-added capabilities to make Singapore more attractive for MNCs engaged in knowledge-intensive activities, The ultimate aim to boost such activities to 40% of GDP over next decade, a transformation which create 20,000 to 25,000 new

jobs a year targeting ten key industries as in petroleum and petrochemical which will become a worldclass hub. Five broad business strategies to diversify among and within industries, robust mix of industries and markets, promote innovation, build up worldclass capabilities, promote innovation, develop local talent and attract foreign ones and create a conducive business environment with necessary infrastructure

The government is best at liberalising and deregulating the telecommunication sector and dealing with GATS2000. The radical opening of the market scrapped restriction on foreign ownership of telecommunication businesses from 49% to completely free competition from 1 April 2000, two years ahead of schedule, abandoning phased liberalisation (Asian Wall Street Journal and Singapore Straits Times, 24 January 2000, Singapore Business Times, 25 January 2000). There is no limit on fixed line or wireless providers, no restrictions on cellular licenses, foreign companies can lay cables connecting Singapore with global telecom networks and offer services themselves instead of through Singapore Telecommunication (Singtel). Satellite delivery of telecommunication is allowed but delivery of broadcasting remains banned.

The NCB and regulator Telecommunication Authority of Singapore (TAS) have merged to form Infocomm Development Authority of Singapore (IDA) on 1 December 1999. The new regulator aims to drive Singapore to become a global information communication centre and worldwide digital hub, be catalyst for change and growth in transformation to be one of world's leading centres for ICT (Singapore Straits Times, 1 December 1999). IDA favours regulation with light touch (any choice) encourage market creativity so long as there is no unfair practice by service providers and consumers are able to make informed choices. It is under the new Ministry of Communications and Information Technology and its foremost priority is to formulate the ICT21 Masterplan expected by March 2000 with three strategic thrusts. These are to develop the ICT sector as major one of growth, leverage on ICT to boost competitiveness of key sectors and prepare Singapore for the information society. In the words of deputy prime minister Lee Hsien Loong, the objective of these thrusts is to "dot.com the 3 Ps", public sector, private sector and people. The merger reflects the shift away from just proliferating personal computers and wiring up or ensuring fair play of telecommunication companies. The convergence of technologies and global environment requires Singapore to "think global" and "think innovation". The next phase needs more innovative services to be spawned and introduced. The new regulator wants the private sector to lead and only acts as a promoter but would be more open than NCB or TAS.

As the key determinant of the KBE is quality of service and no more of competing on low cost infrastructure, labour and other costs, motivating the people and society to embrace ICT is as crucial. A critical constraint is manpower shortage as Singapore's IT pool of 37,000 IT professionals is insufficient and tertiary institutions only turn out 4,2000 a year. Since June 1999, the EDB has brought together key players in industry and tertiary institutions to devise specialist manpower programmes to teach IT-qualified and IT-savvy professional specific and broad ranging e-commerce skills. To attain the new economy and KBE by 2010 under ICT21, the people and society must change their mindsets. There is a also paradigm shift in business and lifestyle with middlemen, namely the small, and medium-sized enterprises (SMEs), sidelined according to chief executive officer (CEO) of IDA, Yong Ying-I (Singapore Business Times, 10 January 2000).

To regulate with a light touch not to discourage private sector and to regulate fairly are among the challenges of IDA which has been perceived as just allowing

competition not encouraging it (Singapore Business Times, 14 and 20 December 1999). This may not be easy in an economy is dominated by a number of government-linked corporations (GLCs) including Singtel spun off from a state-owned monopoly. In particular, IDA has to intermediate between the two fixed line providers, Starhub and Singtel which signed their interconnection agreement on 30 June 1999 but were unable to agree on certain operational and procedural details in implementation. IDA acts to facilitate introduction of effective and sustainable competition to these two fixed-line providers with stipulated procedures and timings.

The Internet Access Service Provider (IASP) market has been fully liberalised since October 1998 and IDA recognises the risk of IASPs with telco parents leveraging on such relations and engage in anti-competitive practices. When free internet surf was offered by SingNet to all its 1.82 million fixed-line customers following StarHub Internet (Singapore Straits Times, 13 December 1999), IDA required both Singtel and StarHub to work with all IASPs in a non-discriminatory and non-exclusive manner. Both were directed by IDA to offer non-affiliated IASPs the same arrangement as they would offer their subsidiary IASPs. Singtel's retaliation was better than StarHub as it provides all customers with free personalised, web-based e-mail.

Alliance Network Telecom (Anttel) filed a complaint on 16 December 1999 about possible anti-competitive practices adopted by Singtel. Philip Yeo, as former SembCorp Industries (SCI) chairman and adviser to SCI's 42% associate Pacific Internet which he founded, has similarly accused Singtel of being Singnet's "sugar daddy" (Business Times, 27 September 1999 and Straits Times, 19 and 21 October 1999). Both Cyberway and PacNet raised subsidy concerns when Singnet launched its toll-free access service in December 1998 as Singnet was Singtel's division until April 1999. While TAS found no cross subsidies after investigation, Yeo's concern was any perception of possible anti-competitive practices by an incumbent monopoly telecom service provider which have to pay charges to the incumbent should be seriously addressed to ensure absolute corporate transparency. It is perhaps no coincidence that there is no competition policy in Singapore given its GLCs but the WTO could be changing that.

Like the rest of Asia, high-technology and Internet by fiat as in Malaysia's MSC, Singapore's US\$1billion fund for technopreneurs and Hong Kong's cyberport appear necessary given the embryonic growth of the private sector. But Asian governments must recognise they have to foster and keep inventive and experimental breed in much larger numbers than what they are luring from US and Europe and rote learning in their education systems is their Achilles' heel (The Economist 5 February 2000, pp 68-70). Saddled with zero-sum game view of world and Microsoft envy, Asian governments try to force their economies down the high technology IT and KBE way to be regional hubs. But the comparative advantage of Asia is in applying new technology developed elsewhere. Being so obsessed with big investments, they tended to compete with each other as well and neither obsession is helpful as the cost of grandeur is measured in more than wasted capital.

Financial rewards of IT-based knowledge also takes time to sink in region which is so unfamiliar with share options. High technology workers in Silicon Valley forgo salaries to work in start-ups, gain precious experience and options instead. But there is no start-up culture, spoilt by quick property and stock market riches. The Asian educated go for engineering, accountancy, law, medical, banking and managerial positions.

The Singapore government and Hong Kong appear willing to let go and leave it to MNCs and local start-ups, dictated by market forces, but much less so in Malaysia. Generally, the Internet business in Asia is hatching with start-ups to meet the voracious appetite and incubation is the hottest development (Far East Economic Review 17 February 2000, p 48-49). Singapore's largest venture capital fund for high technology is going into an incubator set-up (The Economist 5 February 2000). The incubator provides seed funding, office space, legal and strategic advice, recruitment help and investor contacts by government and quasi-government agencies. Start-ups attract venture capital and obtains a new office and leave the nest eventually.

Asian capitalists are helping Silicon Valley start-ups expand into Asia and Asian start-ups are going the other way (Table 3). Asian venture capitalists from Taiwan, Singapore and Hong Kong have ploughed in between US\$700 million to US\$1 billion into Silicon Valley in 1999 (total investment there US\$13 billion) and the most active is Acer-Technology Ventures, subsidiary of Acer from Taiwan which has invested US\$40 million in 15 projects in Silicon Valley with a second US\$200 million fund to be launched in April 2000 (Far Eastern Economic Review, 17 February 2000, p 51-52).

Table 3 Asian venture capital funds in Silicon

Venture TDF set up by Singapore govt	Invested \$90 million. 40% of which in startups in Silicon Valley
AsiaTech Ventures by HK and Taiwan-based firms	Invested \$75 million in Silicon Valley
Acer Technology Ventures, subsidiary of Acer	Invested \$40 million in Silicon Valley and Boston, \$200million fund to be launched in US Apr 2000
Investar Capital, set up by Taiwan semiconductor firms	Invested \$200 million in Silicon Valley

Source: Far Eastern Economic Review, 17 February 2000, p 52.

Plugged into the entrepreneurial environment, companies ride in the first wave or will be left behind. Supplying more than money, established Internet-based electronic platforms link manufacturers, suppliers, distributors and service providers in a seamless global supply chain. Talents cross-fertilised as important source of start-up funds for immigrant entrepreneurs who traditionally have no contacts in mainland US venture capital community. Matchmaking on webstites, breaking into Silicon Valley are not easy tasks as most Asian venture capitalists have a difficult time getting into one-tier deals. The joint venture community is still a closed one in Silicon Valley and there are some 300 venture capital funds looking for promising companies in which to park their money. In other word, there is too much money after too few projects, with more failures than successes, 1 in 10. Even government-led efforts may not guarantee success. On the other hand, Asia may be inspired by the Indians from the US who are leaving for Bangalore, fuelling their home growth and the biggest reason is opportunity, everything done in US can be done at home as well (Far Eastern Economic Review, 17 February 2000, pp 44-5).

5 Conclusion and prospects

The import and significance of Internet is still evolving. Technology has run far ahead of traditional means of regulation and control. Applications and practices

have become so unleashed and unbridled that the most practical and best policy seem to be simply to let Internet be so. Internet has undoubtedly created a paradigm and revolution that no force in the public or private sector can ignore. Instead, they have to come together to manage Internet governance together. As shown in this paper, because Internet is such an open protocol and has empowered the consumers more than the oligopolistic corporations, the perfectly competitive market structure may have returned to reclaim consumer sovereignty. However, consumer communities still need to be organised and prove adequate to the task and they would be the ultimate stewards of Internet governance.

In this paper we have attempted to demonstrate how Internet governance would have immense implications on work and hence industrial and labour relations, on way business and commerce is conducted between businesses and with consumers as well as affecting trade in services in the global economy. Without good Internet governance, IPR issues and more social issues affecting privacy of individuals as workers and consumers are also implicated as there is less and less ability to protect and control the way and rate IT can multiply and disseminate information of all sorts electronically.

We conclude that as in all new revolutions and technology, if the ultimate goal is the greatest good for the greatest number of people, this ICT, new economy and KBE facilitated by Internet should be jointly regulated by both government and society at large. Business, professional bodies, international agencies and bodies including the WTO and Organisation for Economic Cooperation and Development (OECD) as well as regional ones such as APEC and ASEAN all have the responsibility to ensure Internet serves mankind efficiently and without discrimination. In the final analysis, because of the truly open nature of Internet, self-regulation is the only possible avenue. This requires education and awareness among the users and providers of Internet services.

The new economy has arrived in parts of Asia and Singapore is on a new threshold gearing up for high technology, KBE and information society. More to the point is after conceptualising what constitutes the new economy, measurement, indicators and statistics. Insofar as the new technology revolution has affected productivity, creatively destroyed jobs and changing work, employment and inflation and much more, concepts have to be redefined or innovated. Peculiar features where after wiring up to preserve or extend market shares, firms may not seem to producing all that much extra output from given inputs and not yield commensurate improvements in economy-wide productivity, implying the situation as quite far along the path of diminishing returns. Possibly too, unlike earlier technology cycles involving the internal combustion engine and electricity which gave rise to entirely new final goods, the new economy based on knowledge and information technology merely redistributed modalities of exchange to the Internet or reducing lead-times in supply chains.

Paul Romer on new economy is not beyond Asia's reach and technology is cure to region's economic woes (Singapore Business Times, August 1999 and 3 September 1999). Once citizens understand that technological change is a process that policy can speed or slow down, they will push politicians to implement policies to speed innovation and the underlying growth trend. Cannot use new growth theory which encourages new discoveries, new improvements and techniques and policies to achieve the most effect on innovation and technology to side step the market. Markets remain extremely powerful institutions. Bitter as market is, making firms go out of business even for no fault of their own, it is wishful thinking that embracing high

technology will allow some countries to avoid the market. Asia is more willing to embrace technology than the market. Neither is high savings an investing in lost of physical capital sufficient without new technology and now, Romer preaches the market cannot be ignored as well.

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