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SPEECH BY GEORGE YEO, MINISTER FOR INFORMATION & THE ARTS AND SECOND MINISTER FOR
TRADE & INDUSTRY, AT THE YOMIURI SHIMBUN SYMPOSIUM IN TOKYO ON "DIGITAL INFORMATION
SOCIETY IN THE NEW CENTURY" ON 12 MAY 99 (AT 1450 HRS)

THE IT REVOLUTION AND SINGAPORE

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Unavoidable Changes

The IT revolution will force a reorganisation of human society. Its historical impact will be similar to those of other technological leaps in the past, like the invention of fire, agriculture, writing, the printing press and electricity. Societies which are able to master the new technology and minimise its negative effects will succeed. Those which are unable to make the adjustment will fall far behind.

2 The explosive growth of the Internet in the last five years after the

invention of the World Wide Web has accelerated the pace of the IT revolution. This is speeding up the transformation of institutional structures. In every country, existing economic, political and social structures, both in the private and public sectors, have come under severe stress. The new challenges to human society are huge. The coming years will be a very difficult period of transition, from the industrial world with its defined structures and hierarchies, to a new web-like world based on human knowledge. This period of transition, which may extend over several decades, will be marked by all kinds of discontinuities including political upheavals, economic crises and new social divisions in human society. I would like to talk about three major challenges arising out of this historical change and Singapore's response to them.

Educati on

3 The first challenge is the education of the young. It is crucial that the next generation is prepared for the IT world. Like many things in education, children learn best when they are young. This applies as much to information technology as it does to reading, writing, arithmetic and music. Many children who do not learn IT when they are young will be IT handicapped for the rest of their lives. Failure to educate them will result in society having to carry a heavy burden for the rest of their lives. Indeed the social division between those who are IT competent and those who are not will define the politics of many societies in the next century.

4 In Singapore, we have decided to tackle the problem of IT competence in a systematic and comprehensive way. This policy is especially important for children from families of the lower socio-economic classes. Children of middle-class families are much less of a problem because their parents will ensure that they are taught computers from a young age. Those in the bottom one-third, however, must be specially looked after because, on their own, they may not have the opportunity.

5 Singapore has an IT education masterplan to create an IT based teaching and learning environment in every school, from the the first year onwards. All primary and secondary schools are already equipped with computers connected to the Internet. For secondary schools and junior colleges, the present ratio of students to computer is 5 to 1. For primary schools, it is 7 to 1. Most kindergartens in Singapore already teach computers to young children through play and simple instruction.

6 The target in the IT education master plan is to increase hands-on use of computers by students to 30% of the curriculum time by the year 2002. To do this, we have to provide one computer for every two pupils. We are making steady progress. By the middle of this year, one in two teachers will be provided with a notebook computer. Every teacher will have his own email account. Every teacher gets a grant of 20% to buy his own computer. He will be expected to use his computer to prepare lessons, to mark homework and to communicate with his pupils.

7 We have been working overtime to wire up all our schools and put them on the Education Ministry broadband network. We are fortunate that all Singapore students are taught English from kindergarten upwards. This makes it easier for them to access international data bases and the Internet. In addition, we encourage Chinese

Singapore students to explore the Chinese Internet world which is growing rapidly.

Entrepreneurship

8 The next challenge which we are concerned with in Singapore is entrepreneurship in the global knowledge-based economy. The IT revolution is both a threat and an opportunity. Old patterns are being undermined. The way R&D, manufacturing and distribution is organised is being rapidly transformed by IT and electronic commerce. Some experts believe that the changes which e-commerce and the Internet will bring about in the next 5-10 years will be as great as the changes that have taken place in the last 50-60 years. Increasingly, all businesses are forced to think globally, even when they only operate locally. Those who are slow to change will be outflanked and bypassed. Those who are quick to change and exploit the new opportunities will prosper. As a Japanese businessman remarked to me recently, "in the past, 'big ate small'; in the future, it will be 'fast eat slow'."

9 Depending on our response, e-commerce and the Internet can either strengthen or weaken Singapore's position as a regional hub for business and financial activities. To remain a hub in the next century, Singapore cannot just be a regional hub. We have to be an international hub in the global web. We are therefore reorganising ourselves in many sectors.

10 In the public sector, we have carried out the computerisation of all ministries, statutory boards and public agencies, including Parliament and the Judiciary. In the last ten years, we have systematically corporatised and privatised many of our departments to make them more flexible and more responsive to market forces. We make it easier for them to outsource and establish lateral relationships with other public and private agencies.

11 Despite the economic crisis in Asia, we have pushed the restructuring of our financial sector in order to promote greater transparency and open competition. Singapore can only succeed as a financial hub if it adopts international best practices and serves the whole world.

12 In 1991, we launched a long-term programme to promote the development of IT and establish Singapore as hub for e-commerce. This involves both hardware and software. The hardware includes the connection of every home, office and school in Singapore to a broadband network called Singapore One. Every home in Singapore already has access to broadband via existing telephone lines using ADSL technology. By the end of the year, every home in Singapore will also be connected by an optical fibre network to the kerbside, and by co-axial cable from the kerbside to the home. But even more important than the physical network is the legal and regulatory structure that we have put in place to facilitate the growth of e-commerce. For e-commerce to flourish, we need certainty in matters like authentication, intellectual property protection, contract definition, dispute resolution and privacy. We need a legal system which is fully equipped to deal with problems arising out of e-commerce.

13 Singapore is a city-state with a long tradition of trading and entrepreneurship. However, entrepreneurship in the next century will increasingly be of a different kind. The great entrepreneurs of the next century would no longer come from traditional fields like automobiles, shipbuilding, petroleum and real estate, but would come instead from the knowledge industries. The Fortune 500 companies indicate these new trends very clearly. Microsoft alone has a greater capitalisation than all the auto companies in North America put together. In fact, AOL's capitalisation is already greater than GM's and Boeing's combined. Yahoo has a capitalisation bigger than that of the entire Jakarta stock exchange. Of course, one may argue that these Internet companies are over-valued but, however over-valued, the trends are clear. Wealth in the next century will be mostly based on human knowledge. Knowledge assets will not be easily valued on the traditional balance sheets. When a knowledge company is acquired, most of the assets will have to be recorded as intangible goodwill.

14 The US leads the world in IT. Talented young people from all over the world migrate to the US, especially to Silicon Valley, in the hope of getting rich quickly. Both Europe and Asia are losing many of their best and brightest to the US and this will have profound implications in the years to come.

15 For Singapore to be in the first league of cities in the next century, we must have our fair share of human talent, especially entrepreneurial talent for the knowledge economy. Either we become a hub for such talent in Asia or we will lose our own talent and become a mediocre city. This is a big challenge for us because of our relatively small size. Singapore's cosmopolitan nature and the widespread use of English are both an advantage and a disadvantage. It is an advantage because foreign talent from other parts of the world find it comfortable and easy to live in Singapore. But this also means the opposite, which is that it is just as easy for Singaporean talent to migrate elsewhere. In order to address this new challenge, the Singapore government has recently launched a high level initiative called the Technopreneurship 21 (T21) Initiative chaired by DPM Dr Tony Tan. The T21 Initiative has three major aspects.

16 The first aspect is to develop the western part of Singapore near the universities as a Science Hub with world-class facilities which are attractive to international talent working in knowledge industries, especially in high technology. In the coming years, we will turn the Buona Vista area in Singapore into a major Science Hub in Asia.

17 The second aspect of the T21 Initiative is to change many of our laws, rules and regulations to facilitate entrepreneurship in high tech. For example, our bankruptcy laws must make it easier for entrepreneurs who have failed to try again. In high tech, those who have failed before are more likely to succeed than those who have never failed before. Of course, we should not make bankruptcy too easy for everyone as this will result in moral hazard. But in the high tech field, we must make major adjustments. The regulations governing the use of apartments for high tech businesses will also be reviewed to make it easier for budding entrepreneurs to start businesses and to reduce the cost of failure.

18 The third aspect in the T21 Initiative is to develop the venture capital market in Singapore. Singapore is already an international financial centre. The

problem is a lack of expertise in the financing of high tech projects. This requires a whole new range of expertise which we have to attract from America and elsewhere to Singapore. To promote the growth of this new financial sector, the Singapore government has set aside a US\$1 billion venture capital fund to be deployed in the next few years. It is crucial for us to succeed in this area. A lively venture capital market in Singapore will not only serve Singapore, it will serve other countries in the region as well.

Value System

19 With respect to the IT revolution, I have discussed the challenges of education and entrepreneurship. I would now like to talk about the challenge which the IT revolution poses to the value system of human society. This is perhaps the most difficult area to address because it involves the culture and power structure of a country.

20 The IT revolution subverts the hierarchical relationships which are important to East Asian society. The relationships between the government and the people, between seniors and juniors in a corporation, between parents and children, between teachers and students, and between men and women, are all being transformed. In the initial phase, the Internet has a democratising effect on social systems. It now becomes much easier to break out of traditional relationships and bypass traditional hierarchies. Much more than letters, faxes or telephone calls, e-mail and Internet websites enable individuals anywhere in the world to broadcast their views and to exchange ideas and information. The result is that all organisations become more web-like in their relationships. In fact, organisations which oppose this new tendency are disadvantaged because the people working in such organisations do not have the knowledge and information which their competitors enjoy.

21 In the family and in school, the ability of parents and teachers to maintain traditional relationships is being weakened everyday by the Internet. Regulating the Internet is now a world-wide problem. Pornography is easily accessible to children and all kinds of groups operate in cyberspace. Some of these groups are evil and can harm children. Therefore, no responsible parent, teacher or government can agree to no regulation of the Internet at all. At the same time, however, regulating the Internet is difficult because of the nature of the technology. When information is reduced to one's and zero's, it is impossible to filter such information completely. Let me explain the way Singapore is attempting to regulate the Internet with a light touch and in a practical manner.

22 Under the Singapore Broadcasting Act, Internet content providers are automatically licensed and given a clear idea of what their responsibilities are. They have to abide by a Code of Practice. Internet service providers and resellers are required to register with the Singapore Broadcasting Authority (SBA) but they are not required to monitor the Internet or its users. However, they may be required by the broadcasting authority to limit public access to 100-200 sites which the SBA considers to be undesirable. The SBA is only concerned with sites which have mass impact. Sites which have no mass impact are treated as communication sites and left unregulated. Sites which originate from Singapore or do business in Singapore must, however, conform to Singapore laws. The SBA depends a lot on ordinary members of the public - on parents, teachers and concerned adults - to

inform it of sites which its attention should be drawn to.

23 In regulating the Internet, our over-riding objective is to promote Internet use in Singapore, especially for education and e-commerce. Singapore is probably the most advanced city in Asia today in terms of Internet use and penetration today.

However, we have to help parents and teachers protect young children. In the market, many types of filter software are available, like Surf Watch and Cyber Patrol, but it is not easy for parents and teachers to install them. Some children know more about such software than their minders. We have therefore required all Internet service providers in Singapore to offer parents and teachers a filtered Internet service called the Family Access Network. It is for teachers and parents to decide whether or not to subscribe to the Family Access Network. We allow the Internet service providers to use different kinds of filters available in the market so long as they meet SBA's minimum standards. In this way, we allow the market to decide which filters should be popularised. Of course, we recognise that no software filter is 100% effective. Even if it is only 70% effective, that is still better than nothing.

24 It is no longer possible for any one country to regulate the Internet on its own in an effective way. Increasingly, regulators around the world will have to work together to ensure that the Internet meets certain minimum international standards. For example, there is universal condemnation of the exploitation of children. There are also sites providing information on the making of bombs and poisonous gases which should not be condoned. However, we must recognise that for pornography and hate sites, it is difficult to establish a world-wide consensus on what the minimum standards should be.

25 Singapore's regulators work closely with other regulators in the world. We support the increasing use of content classification, especially the standard developed by the World Wide Web consortium. This is equivalent to the V-chip in the TV industry.

26 The Internet challenge to our value system goes beyond the protection of children and the enforcement of minimum standards. In fact, all organisations in the public and private sectors are affected. For example, the Internet is bound to weaken national tax authorities as more and more businesses move into e-commerce.

27 In the longer term, the IT revolution will create new divisions in human society, between those who master the new technology and those who are unable to. IT will be used for both constructive and destructive purposes. For example, IT warfare will create completely new situations for modern armies. Within each country, political structures will change because of changes in the way wealth is created and income is distributed. Modern political systems arose out of competition between different interest groups in the industrial economy, between those who work on the farms and those who live in cities, between those who own capital and those who earn wages, between the landed and the landless, and between the rich and the poor. In the next century, the pattern will change dramatically. The old trade union structure, for example, will be weakened as work organisation becomes less hierarchical and the division between white-collar and blue-collar work becomes diffused. Political parties will have to re-invent themselves to engage new political constituencies especially among younger voters living in big cities.

28 One major problem is the inversion of the knowledge pyramid in human society. It used to be that the older one becomes the more one knows. This may always be true where human wisdom and maturity are involved. But, in many areas - like IT, science, medicine, finance and fashion - younger people often have more updated knowledge than older people. When parents see what their children are able to do with the computer, they feel a tension within themselves. While they are proud of their children, they also feel acutely their own obsolescence. Because of the speed of IT development, every ten years throw up a new generation who are better equipped. Those in their 30's know they are not as good as those in their 20's, and those in their 20's are already behind those in their teens. This has never been the case before in human society. The implications on social value systems are profound. Human cultures will be transformed.

29 Those organisations which are able to tap the knowledge and creativity of the younger generation will be able to advance more quickly. Those organisations which are unable to do so will be at a competitive disadvantage. What then should be the correct relationship between the old and the young in this new world? What does human wisdom mean in the future? What will happen to those who for one reason or another are unable to cope with the new technology? How should they be accommodated in society? Will some societies or racial groups dominate others? There are no easy answers to these questions and human society may have to go through crisis and revolution before good solutions are found.

30 In Singapore, we are particularly worried because we are a relatively small, cosmopolitan society. If we do not handle these new tensions well, we will not be able to hold together. We have recently embarked on a nation-wide exercise involving all sectors to prepare our society for the next century. Despite globalisation, we want all Singaporeans in the world to share a common heartbeat. In particular, it is important for us to understand the hopes and fears of younger Singaporeans, and engage them in the process of re-inventing our society. We have launched a Singapore 21 Movement involving Singaporeans of all races and age groups. No one knows all the answers - neither the government nor university professors nor NGOs (non-government organisations) - but we know we face some very serious challenges ahead. The IT revolution will not only create new antagonisms between the old and the young, it will also accentuate antagonisms between racial and religious groups. This is because differences in the value systems of different racial and religious groups will result in different responses and different speeds of response to the IT challenge.

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Conclusion

31 Whether we like it or not, we are arriving at a turning point in human history. Singapore is like a small boat which is very sensitive to changes in the global tidal flow. Larger boats may take longer to respond to the changing tide but they enjoy the advantage of greater stability. In Singapore, if we are not careful, we can be swept aside. But if we respond early and correctly, we can achieve a good position when the rising tide becomes a full flow. This is the reason why Singapore has responded in a certain way to the challenges of education, entrepreneurship and changing social values.

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