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Creating Space in the Global Economy: Building a High Tech Dream in Malaysia

LOONG WONG

ABSTRACT *The globalisation of innovation has become a major issue in the discourses of economic development. There is a view that unfettered market forces will promote greater and better developmental outcomes and for this to happen, the state must play a minimalist role. There is the other view that argues that the state can play 'catalytic' roles and mediate the forces of globalisation to engender outcomes congruent to its aspirations. In this paper, we look at the experiences of one Asian state, Malaysia. The paper will examine the historical evolution of technology policies in Malaysia. It argues that the Malaysian state has been an active change agent and has sought to realise its vision of becoming a democratic, modern and 'developed society' via its latest technology flagship, the Multimedia Supercorridor (MSC). The paper argues that, despite its resoluteness and investment in the project, the Malaysian state is unlikely to succeed in producing its high tech utopia. Rooted in a highly technocratic and managerial context, the Malaysian vision fails to account for the prevailing institutional forces impacting on, and impeding transformation in Malaysia.*

Keywords: Malaysia, high technology, technology policy, Multimedia Supercorridor, information and communication technology.

Introduction

'Late developing' countries are faced with the issue and pressures of engineering rapid economic growth for their citizens in the face of increasing globalisation. Traditional protectionism, whether tariff-based or based on import-substitution, is more and more difficult to effect because the emerging new international trade order inhibits these 'latecomers' from closing their markets, even selectively. Only a few countries, such as China, have the market size that gives them the clout and real bargaining power in this global trade domain. Most countries have to develop and sustain their industrial growth on the basis of products that do not lock them into low-wage competitive growth trajectories. This poses a particular problem for these countries: they do not have fully developed social, economic, political and technological institutions enabling them to transform themselves into newly-developed societies. Moreover, they have come to the development game with

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relatively low per capita incomes and need to generate both sustainable employment and increased income for those citizens who are employed.

The pace of globalisation and the increasing use and speed of the new information and communication technologies (ICTs) have led policy analysts and businesses to push the argument that ICTs are now a basic but critical factor of production, enabling greater strategic gains in productivity and economic growth.[1] The new ICTs hold out the promise of a new borderless, global market where the traditional rules of competition no longer apply. Small players now have the world at their feet and, it is argued, any company and/or nation-state can compete successfully in this new global market.[2]

Armed with this insight and the desire to see their countries evolve into highly developed societies and economies, governments find themselves gravitating to and embracing ICTs as the tools of development. With these tools they intend developing new strategic and competitive engines of development propelling them to the next evolutionary stage of development. They will leapfrog development, becoming 'third wave' societies no longer bound by the usual constraints.[3] Failure will leave them languishing in the doldrums of development with its attendant social and economic consequences. This fate has spurred many Asian governments to develop policies focusing on these new technologies as they seek to manage the forces of globalisation. Various writers have argued that this push has prompted intense competition between these countries, and that not all will succeed in their quest.[4]

This paper looks at Malaysia, one of the second tier Asian economies, and its attempt to develop its ICT strategies. An analysis of the Malaysian case is important for a number of reasons. For a long time, Malaysia has been part of the phenomenon of 'Asian miracle economies' with its pro-market economy and seemingly transformative capacity. More critically, the Malaysian case is one of the most systemic and substantive socio-economic and cultural transformations via ICTs in any country. The Malaysian government has developed a futuristic blueprint.[5] Bill Gates, perhaps predictably, notes that:

> Malaysia offers a blueprint through the MSC (Multimedia Supercorridor) initiative for how a developing country can use technology to move to the forefront of modern technology. All of the technology projects in the MSC initiative involve approaches that I have called the 'digital nervous system' and the 'web lifestyle'. These are ways to use technology to create greater efficiencies in government operations, to serve citizens better, to improve and broaden education and to help businesses compete globally.[6]

While the pronouncements of 'cyberbarons' and 'third wavers' such as Bill Gates and Alvin Toffler may be dismissed on ideological grounds, ICTs have also been the subject of more critical comment.[7] 'Teletopias', 'telecommunities' and 'wired cities/regions/communities/nations' are said to increase socio-economic and political participation in an increasingly global society.

This paper seeks to explain the new developmental regime in Malaysia. It argues that an exclusive focus on technological triumphalism neglects critical variables in the development calculus, and obscures critical analysis. Joseph Schumpeter has exhorted analysts not to be engrossed with growth but to examine development. He also pointed out that 'the economic state of a people does not emerge simply from the preceding economic conditions but only from the preceding total situation'.[8]

This paper has been informed by this perspective. In as much as Malaysia has been able to generate rather impressive growth rates and to chart new directions for itself, there is clearly a social context and an historical progression in the unfolding of its development and technological quest. Accordingly, the paper starts with an historical account of Malaysia's socio-economic development. It next maps the Malaysian industrial programme and develops the links between this programme and the 'architecture' arising from this development. The discussion then moves to an analysis of the much-publicised ICT revolution in Malaysia, including the MSC. It argues that despite its seemingly technical appearance, the MSC must be understood as complex social objects embedded in political, social and symbolic processes reaching far beyond the geo-economic territories they occupy.[9] The paper next evaluates the efficacy and ability of the Malaysian state in trying to propel Malaysia onto the next lap of development as it seeks to come to grips with this complex phenomena of managing space and social relations.

The Malaysian Socio-economic Framework

Malaysia was a British colony and became independent in 1957. The nineteenth century government developed a colonial division of labour. Chinese and Indians were brought in to develop the colony's tin mines and plantations while the Malays were 'protected' by the British and found themselves ensconced in the bureaucracies and trained to be administrators and rulers.[10] In an independent Malaysia, these divisions became enshrined in legal edicts and the national constitution.[11]

The post-colonial state sought to effect a new and relatively autonomous role for itself, but found itself constrained by an ethnic pact, a political coalition arrangement whereby the major ethnic groups were represented by three major communal parties. The growth of Malay capital was acceptable as long as it did not threaten local Chinese and foreign interests. This arrangement began to unravel as declining global commodity prices impacted on the growing population. Unemployment and poverty rose, and the effects were felt most acutely amongst the Malays.[12]

This growing disenchantment and resentment, fanned by extremist elements within the ruling UMNO (United Malay National Organisation) party, led to the disastrous racial riots of 1969 when Parliament was suspended and a reconstituted regime came to power. Realising the potential of the state, its capacity and the available largesse, this new regime sought to refashion the Malaysian political economy to suit its own agenda. The state was itself enlarged and began to take a more active and interventionist role to 'establish new industrial activities in selected new growth areas and of creating a Malay commercial and industrial community'.[13]

To realise these objectives, the Malaysian state and its managers had to seek new sources of capital. Local non-Malay capital was unacceptable. The state thus redirected the flow of foreign capital from primary industries to manufacturing. At the same time, it created a whole new structure of interlocking political and business organisations populated by state and party capitalists.[14] These rent-seekers were protected from competition and had easy access to concessions, licences, monopoly rights and government subsidies (usually through low-interest loans from government financial institutions).[15]

Through such interventions, the socio-economic base was transformed. Malaysia by 1993 had become a manufacturing country propelled along this path by foreign investment.[16] The World Bank declared that Malaysia had become one

of the eight High Performing Asian Economies (HPAES) and touted it as an example for others to emulate, especially its market-friendly policies and facilitative government.[17] Amidst these developments, the Prime Minister, Dr Mahathir Mohamad, looms large. A Malay nationalist who lost his seat in 1969 but was brought back in by the new reform regime, he rose very quickly from being the Minister of Education to assume the position of Prime Minister in 1981. The next section will examine Malaysia's development policies since Mahathir Mohamad came to power.

The Imperative of Technology and Industrialisation

In a series of speeches before becoming Prime Minister, Mahathir located his analysis of Malaysia (and developing countries) in a 'development of underdevelopment' framework. Reflecting on economic history, Mahathir noted that there used to be two co-existing segments in the world economy, one producing raw materials while the other converted these raw materials into manufactured goods and resold them to the first segment. The law of comparative advantage, however, went askew and the primary producing countries found themselves remaining poor as they lacked the technology and the skills to process and sell the manufactured products.[18] Elsewhere, he talked of the transformative capability of these new technologies and the 1985–86 recession allowed him to push for heavy industrialisation to reshape the country's development.[19] This new initiative added yet another dimension to the Malaysian developmental infrastructure. Mahathir saw it as enhancing national economic foundations with Malaysia no longer locked into the 'mediocrity of mere assembly operations',[20] but actively involved in the higher technology industries.[21]

This faith in high technology has been articulated repeatedly by Mahathir. As Minister of Trade and Industry, before he became Prime Minister, he ushered in the state-owned Heavy Industries Corporation of Malaysia (HICOM), which he saw as engendering 'technopoles' and facilitating new industrial growth.[22] On coming to office, he brought HICOM into the Prime Minister's ambit and pushed for the development of new industries—the national car, Proton; a steel complex, Perwaja Steel; cement plants; motor-cycle engine and electrical appliances factories. Machado suggests that Mahathir's heavy industrialisation drive was 'aimed at reducing Malaysia's economic dependence on advanced capitalist states in general and on world commodity markets in particular for both economic and nationalistic reasons'.[23]

To effect this shift, Malaysia had to be socially re-engineered and transfused with a new culture. Scouting for a 'software' to lead its development push, Malaysia turned to East Asia and sought to emulate its practices. In particular, five common factors were identified as critical attributes: embracing the free market; development of a dynamic and aggressive private sector; a high savings rate and consequently, high investment rate; adopting of an export-oriented and competitive programme; and an ability to work up the industrial and technological gradient. The Look East policy came into effect in 1981, and shortly after the state embraced privatisation and revamped itself through the Malaysian Incorporated concept. The state and private sector were to be mutually reinforcing mechanisms, united in national development efforts. The capstone was Mahathir's master plan—his 2020 Vision for Malaysia in which he envisaged Malaysia as a 'fully developed' society with its defining 'corporate values'.[24] These values include:

1. a united, peaceful, integrated and harmonious Malaysian nation;
2. a secure, confident, respected and robust society committed to excellence;
3. a mature, consensual and exemplary democracy;
4. a 'fully moral' society strongly imbued with spiritual values and the highest ethical standards;
5. a mature, liberal and tolerant Malaysian society;
6. a scientific, progressive, innovative and forward-looking society;
7. a caring society with a family-based welfare system;
8. an 'economically just' society with fair and equitable distribution of wealth; and
9. a 'fully competitive, dynamic, robust and resilient and prosperous' society.

Via this corporate plan and the inculcation and diffusion of its enunciated values, Malaysians were given focus and direction, 'set bigger goals for greater achievement' and mobilised in the nation's strategy to 'promote its competitive edge in the global market'.[25]

The New Developmental Architecture

In line with its new economic direction, the Malaysian government set about changing the structure and content of its science and technology policy. The (re)newed architecture was to give it both ballast and *gravitas*. Coordination and direction of the country's technology policy was entrusted to a Science Advisor who was part of the Prime Minister's office. Via the Advisor, the government developed the Intensification of Research in Priority Areas (IRPA) programme in 1986 and the Action Plan for Industrial Technology Development (APITD) in 1990.[26] The government also introduced tax incentives for R&D and created new public research centres. The bureaucracy was rationalised and the Ministry of Science, Technology and the Environment gained overall responsibility for managing national technology policy, albeit under directions from a new Committee on Science and Technology (located in the Prime Minister's office). The state accelerated institutional development under the Sixth Malaysia Plan (1991–95) and various new science and technology centres were established. It also developed technology parks in Kulim and Kuala Lumpur, and sought to incorporate greater private sector involvement via various peak planning councils and new organisations [for example, the Malaysian Business Council, the Malaysian Technology Development Corporation (MTDC) and the Malaysian Industry–Government Group for High Technology (MIGHT)]. As a consequence of these reforms, new firms were created specialising in technologically advanced electronic processes and products, such as highly advanced thin-film disk manufacture and semiconductor testing and assembly.[27] Moreover, a new group of fast-growing, large local firms (for example, Sapura, Likom, HIL and UNISEM) began to compete technologically in world markets.[28] Companies outside the microelectronics industry have also flourished.

Despite these advances and the high priority of technology and telecommunications policies, poor linkages among the state, academia, and economic actors have led to mixed outcomes. Technological development is still confined to the foreign transnational sector (with very little real transfer), and there is still a dearth of skilled technical staff with a consequent concentration of industries in the low-skill, low-technology processes of assembly and test.[29] Recognising that current

development had reached an impasse, the Malaysian state sought to effect another path-dependence transformation.[30] Malaysia's new industrial strategy will:

> . . . emphasise the development of export-oriented high-value added, high technology industries . . . more capital-intensive and technologically sophisticated industries producing better quality and competitive products that are integrated with the markets of developed countries . . . (involving) greater automation or other labour-saving production processes to reduce labour utilization.[31]

ICT is to be the key to economic well-being and will also be the tool driving the national economic quest. This will be further underpinned by the private sector with a government commitment to liberalisation and a reduced role for the government in the economic processes.

Increasingly confident with its 'success', the Malaysian state launched the Multimedia Supercorridor (MSC), a multi-billion dollar project designed to encourage research, development and collaboration between the public and private sector in leading edge information technologies. The MSC is to play a salient role in harnessing and managing global flows of information and capital. To effect this vision, the government has committed itself to expanding its industrial linkages, increasing its R&D budgets, and attempting to accelerate the pace of incremental technological progress across multiple industries. It is developing a national information technology (IT) plan, to ensure widespread IT diffusion and application within the country and develop Malaysia as a major regional and international IT hub, with the necessary telecommunications infrastructure (Malaysia, 1996, p. 460).[32] 'A visionary project for the Internet age',[33] the MSC is to be Malaysia's own Silicon Valley.[34]

Designer Development: The Multimedia Supercorridor

The MSC is a 50×15 kilometre zone extending southwards from the national capital, Kuala Lumpur. Stretching from the capital's central business district, it includes a number of residential, commercial and industrial developments, including the world's tallest building, Petronas Towers, and the new Kuala Lumpur International Airport in Sepang. In between, two 'intelligent' cities are undergoing construction: Putrajaya, the new Federal Government administrative capital; and Cyberjaya, the private sector satellite city populated by high technology firms. These technopoles are the drivers of the MSC.[35] Infrastructural provisions include a 2.5–10 gigabit per second fibre-optic backbone; a high-speed direct fibre link to major international centres in the US, Europe, Japan and ASEAN; open standard, high-speed switching and multiple protocols; regional satellite services; wireless communication and other value-added services, including internationally-competitive telecommunications tariffs and performance guarantees.[36] These links are capable of handling advanced telephony, data exchange and interactive multimedia services, as well as an integrated transport network comprising high-speed rail, road and air linkages. Customised office space for commercial activities and corporate research, interspersed with hillside mansions, lakefront houses and condominiums and a new Multimedia University to 'enhance creative dynamics between research and industry' are also part of its infrastructural menu.[37]

Aside from the provision of infrastructure, the Malaysian government provides a range of financial incentives including a 10-year, 100% investment tax exemption allowance and duty waiver on imported multimedia equipment. Local firms are funded up to 50% of allowable research costs while foreign firms are granted complete freedom of ownership, capital sourcing and remission of profits, including exemption from foreign exchange controls. MSC firms also enjoy unlimited freedom to import foreign knowledge workers.[38] New cyber legislations were also introduced, including a Digital Signatures Act to facilitate electronic commerce; the Copyright Amendment Act to enhance intellectual property protection; a Multimedia and Communication Act clarifying the legal position on media convergence; the Data Protection Act governing the gathering and exchange of personal information; the Telemedicine Act and the Electronic Government Act. In effect, this legislation exempted operators from national laws.

With a budget of RM30 million, the Multimedia Development Corporation (MDC), a 100% publicly-owned corporation, was established in June 1996. Combining the 'efficiency and effectiveness of a private company having entrepreneurial flair with the decision-making and authority of a high-powered government agency', the MDC was charged with the task of developing the MSC.[39] The strategic direction of the MSC is decided by the National Information Technology Council, headed by the Malaysian Prime Minister and his advisors (including a small group of government officials and corporate leaders). Also critical and influential is the International Advisory Panel on the MSC, consisting of the Prime Minister and a board made up primarily of presidents and CEOs of the world's largest IT firms and consultants (including Netscape, IBM, Microsoft, Softbank, NTT, Sun, Hewlett Packard, Siemens, Ericsson etc).[40] Local institutions, Telekom Malaysia and the Malaysian Institute of Microlectronics (MIMOS), also play critical shaping roles.

The MSC commenced operations in September 1996 and sought to develop a cluster of flagship activities. These can be divided into two broad categories: (1) 'multimedia development' applications including electronic government, a multi-purpose smart card, smart schools and telemedicine; and (2) a 'multimedia environment', comprising a research and development cluster, worldwide manufacturing webs and borderless marketing applications and infrastructure. Via these activities, Malaysia would evolve an infrastructure and culture appropriate to an advanced knowledge society. As Mahathir puts it, 'the MSC is a pilot project for harmonising our entire country with the global forces shaping the Information Age'.[41] Clearly, the MSC is more than a technical project—it is a social transformation project and is deeply implicated in discourses of post-industrial high tech futures. The MSC also calls into question the notion that states are redundant in effecting change in the face of untrammeled globalisation.

Creating Pleasantville: A High Tech Utopia?

Several writers have suggested that the operations of the information economy can actually make space and place more, rather than less, critical in global economy.[42] In heightening sensitivity to spatial variations (such as costs and quality of human resources, physical infrastructure and a wide quality of life factors), ICT enables places to differentiate themselves from other places. In the case of the MSC, this distinguishing trait is clearly evident. Unlike other development projects, the MSC does not see itself as the progenitor of balanced growth. On the contrary, it sees

itself as an exemplar of a high-modernism; its twin cities are seen as 'intelligent' cities, showcasing new and sustainable multimedia urban lifestyles, designed to improve the quality of life in Kuala Lumpur.[43] As cities 'built by Malaysians for Malaysians',[44] they fuel nationalism, reaffirming the government's vision and strategy. In merging the cultural, social, developmental and technological aspirations of Malaysians into a 'happening', the MSC is a model. Clearly, the MSC is more than a technical fix—it is part of a greater project of 'governmentality'.

Portrayed as 'an environment where collaboration, creativity and risk-sharing are fostered'[45] and populated by 'a substantial number of knowledge workers',[46] the MSC is defined by a seamless network of flexible organisational forms. Its population is imbued with attributes and attitudes necessary for success in the global market economy. As part of the global economy, the MSC and the twin cities of Cyberjaya and Putrajaya are intended not merely as technological and/or industrial parks. They are part of a planned environment, a test-bed for the long-term development of a competitive, developed Malaysian economy and society.[47] In demonstrating the critical role of ICT, via the MSC, Malaysia can 'leapfrog into leadership in the Information Age',[48] and thus engineer a new model of non-Western modernity.[49] The MSC's test-bed status allows Malaysia to cordon off the excesses of Western ICT. The MSC is not merely a fix or a strategy, but multi-layered and multi-dimensional. It is both complex and contradictory and yet it engenders the possibility of a high tech fantasy.

End of a Fantasy?

All fantasies have their following. At its inception, the MSC generated a great deal of interest and optimism in Malaysia and globally. It was seen as a blueprint for the future consonant with the technovangelistic aspirations of the new global economy. In Malaysia, the population was enthused, mobilised and the MSC became part of everyday discourse. Public pronouncements in the print media and on television extolled its virtues, politicians sought MSC photo opportunities, and conversation everywhere revolved round aspects of the MSC. Since 1996, the MSC has consumed much public money and some 500 companies have been approved as MSC firms. Despite all this and extensive promotion in the United States, Europe, Japan and Australia, the Malaysian Prime Minister was forced to declare in 2001 that Malaysia's 'gift to the world', the MSC, had not delivered on its promise. This was because neither the capital nor the expected numbers of foreign firms prepared to establish their base in Malaysia and effect technology transfer have materialised. Success for Mahathir and his supporters is dependent on attracting the kind of people and firms that create new technologies. The subscript of a post-industrial and civil society is now ignored.

Proponents of the MSC have attributed its failure to the 1997 Asian financial crisis and the ensuing economic and political fallout. They argue that the government's economic direction and the political instability as a consequence of the removal of the Deputy Prime Minister, Anwar Ibrahim, has resulted in a slowing down of foreign investment and interest in Malaysia.[50] While there is a modicum of truth in these claims, they are also rather simplistic. They fail to recognise that 'thick' descriptions of the socio-economic landscape of Malaysia are equally important.[51] Economic figures since the crisis suggest that foreign investment, apart from an initial blip, has been returning to Malaysia and the country is still seen in financial markets as a highly attractive investment outlet.

A more nuanced explanation for the failure of the MSC can be found in the discourse of high tech development itself. A number of writers have suggested that high tech development does not merely follow a linear path, but is complex and laced with many possibly contradictory forces. A failure to manage these satisfactorily results in high tech fantasy, doomed to failure.[52] For these writers, a high tech lookalike is not enough. More critical are the presence and the viability of institutions. These institutions are pivotal and constitute 'the formal rules, compliance procedures, and standard operating practices that structure the relationship between individuals in various units of the polity and economy'.[53] They also structure incentives, shape the way societies evolve through time, and are necessarily dynamic in nature, through time, across societies and across industrial sectors. They include not only state structures and the conventional interactions between government agencies and actors, but also societal structures, culture and the rules of the game to which key players in the policy-making process adhere. In short, institutions provide the architectural foundations and 'software' through which socio-economic transformation is effected.[54]

In the case of the MSC, Malaysia's institutions are critical concerns. State agencies are cumbersome, inflexible, slow to respond and lack entrepreneurial flair (identified by Mahathir as one of the failings of Malaysia's government machinery). There is also the lack of a learning culture and technical skills are particularly at a premium.[55] Some 60% of Malaysia's population has some form of secondary education, but only 6% has some vocational training and only a further 7%, university education. Of the small numbers enrolled in tertiary level education, even fewer (0.07% of the population) is studying technical subjects.[56] Fragmented educational policies and the 'ethnic issue' further compound Malaysia's skills deficit.[57] Enrolments at the tertiary level and staff appointments are hampered by ethnic quotas and declining interest in science and technology programmes.[58] Affirmative action policies mean that about 80% of university places are allocated solely to Malays.

This institutional failing is also evident in industry training schemes.[59] Despite imposing a 1% payroll levy on firms with over 50 employees to fund training programmes via the Human Resource Development Fund (HRDF), the government, because it does not discriminate between low- and high-paid employees, ensures that there is no disincentive for firms to continue using low-skilled employees. On the contrary, it provides an incentive for firms to use lower-skilled and lower-paid employees, and hence incur lower taxes. The HRDF is also biased against large firms—it is applied only to firms employing more than 50 people. Small firms do not see the need to upgrade their skills and technologies to maintain their productivity and competitive edge. There is also the issue of job-hopping, especially for employees with middle- to high-level skills,[60] which further diminishes the incentives for firms to train.

Malaysia clearly lacks a sound human resource and skills base. Adding to this deficit is the issue of R&D. Malaysia's effort to develop product and design R&D has been conspicuously weak, about 0.03% of GDP.[61] Even its budget for public R&D (2% of GDP) has not been fully spent. Lack of interest, scarce technical human resources and inefficient and ineffective economic policies mean a low research and developmental capacity. Without this institutional capacity to foster and ensure cooperative research linkages at the micro level, innovation remains scarce.

In addition, the necessary prerequisite 'software'—institutional practices and arrangements—are clearly inadequate. This means that Malaysia's quest for a new

developmental path engineered by ICTs is compromised. The analysis offered in this paper indicates that states wishing to effect full transformation need to ensure that institutional capacities and capabilities are present. These institutions are vital, enabling growth to be organic and self-sustaining. Be that as it may, it would be churlish to dismiss the Malaysian experiment with technopoles as a total failure. Malaysia has been able to mobilise a nation-building project, although falling in its aspirations to play a leading role in global development. This is clearly not possible for a developing country dependent on the vicissitudes of a global economy.

Conclusion

The MSC is arguably 'one of the most ambitious state-run projects ever conceived in Asia'.[62] More importantly, it was the first IT-led economic transformation project in the world through which a developing country was to transform and acquire developed country status. It sought to validate a form of technocratic dreaming in which planned technopoles could tap and corral global information flows into managed development. This vision is extremely seductive, the stuff legends are made of. Malaysia, according to its Prime Minister, was to be a global test-bed where collaborating companies and smart regions would benefit from participation in the MSC.[63] But the Malaysian state, with its 'pre-programmed software', its racial arithmetic and its own socio-political processes and institutions, has found the transformation difficult to effect. Despite its proclamations of the visionary 2020 concept and a 'bangsa Malaysia' (Malaysian race), the state continues to use its largesse to create a class of Malay entrepreneurs. This breeds resentment, anger and distrust amongst Malaysia's other ethnic communities. Similarly, educational policies still discriminate against well-qualified Chinese Malaysians, and resources devoted to education, training, research and development are quite inadequate.[64]

The Malaysian government's MSC project is a fantasy. It fails to account for the fact that as important and powerful as states are in effecting developments through their stimulus of the market or overcoming the problems of capital accumulation and risk aversion, they cannot decree and effect innovation and development. These innovatory impulses are far more complex, tend to be organic and are nurtured in institutional settings. These are not predetermined, nor do they constitute a singular fixed programme of actions and outcomes; they are often tentative, evolving and not easily replicated. As such, adherents of an all-embracing technological solution, who believe that there is only one developmental highway, will find that reality allows many permutations. There is no singular developmental DNA. The Malaysian vision of a high tech, post-industrial future is neither realistic nor a future in which everyone will share.

Notes and References

1. See M. Jussawalla, 'The impact of ICT convergence on development in the Asian region', *Telecommunications Policy*, 23, 1999, pp. 217–34; ITU (International Telecommunications Union), *World Telecommunications Report*, ITU, Geneva, 1998; E. J. Wilson III, 'Investing in the global information future', *Futures*, 30, 1, 1998, pp. 23–42.
2. See, for example, F. Cairncross, *The End of Distance: How the Communications Revolution Will Change our Lives*, Harvard University Press, Cambridge, MA, 1997; J. Ho, *Cyber-Tigers: How Companies in Asia can Prosper from E-Commerce*, Prentice-Hall, Singapore, 2000.

3. This is articulated most forcefully in J. P. Singh, *Leapfrogging Development? The Political Economy of Telecommunications Restructuring*, State University of New York Press, Albany, 1999. See Ho, *op. cit.*; C. K. Prahalad, 'Let's focus on the digital dividend', 2000 (http://www.ebfonline.com).
4. These writers include: M. Hobday, *Innovation in East Asia*, Edward Elgar, London, 1995; D. O'Connor, 'Technology and industrial development in Asian NIEs: past performance and future prospects', in D. F. Simon (ed.), *The Emerging Technological Trajectory of the Pacific Rim*, Sharpe, Armonk, 1995; D. F. Simon, 'Globalisation, regionalisation and the Pacific Rim', in Simon, *ibid*; J. V. Langdale, 'International competitiveness in East Asia', *Telecommunications Policy*, 21, 3, 1997, pp. 235–49.
5. Jussawalla, *op. cit.*, pp. 227–9.
6. Bill Gates' comments were given extensive coverage in the local daily, *New Straits Times*, 15 March 1998.
7. M. Castells, *The Rise of the Network Society*, Basil Blackwell, Oxford, 1996; P. Norris, *Digital Divide: Civic Engagement, Information Poverty and the Internet Worldwide*, Cambridge University Press, Cambridge, 2001; T. Jordan, *Cyberpower: The Culture and Politics of Cyberspace and the Internet*, Routledge, London, 1999.
8. J. Schumpeter, *The Theory of Economic Development*, Harvard University Press, Cambridge, MA, 1934, p. 58.
9. See the discussion in D. Massey *et al., High-Tech Fantasies: Science Parks in Society, Science and Space*, Routledge, London, 1992.
10. Eric Hobsbawm and Terence Ranger, *The Invention of Tradition*, Cambridge University Press, Cambridge, 1983, argue that colonial authorities 'invented' traditions for favoured groups and then trained them to take on administrative roles.
11. See, for example, B. N. Cham, 'Colonialism and communalism in Malaysia', *Journal of Contemporary Asia*, 1977, pp. 178–99; K. S. Jomo, *A Question of Class*, Oxford University Press, Oxford, 1977; L. Wong, 'A political economy of Malaysia', paper presented at *Racialism in Post-Colonial Societies Conference*, University of Sydney, 1988.
12. L. Wong, 'The state and organised labour in West Malaysia, 1967–1980', *Journal of Contemporary Asia*, 23, 1993, pp. 214–37; L. Wong and B. Blaskett, 'Restricting space in post-colonial state', in J. Camilleri (ed.), *The State in Transition*, Lynne Reiner, Boulder, 1995.
13. Malaysia, *Second Malaysia Plan, 1971–75*, Government of Malaysia, Kuala Lumpur, 1971.
14. Wong, 1988, 1993, *op. cit.*
15. By 1975, 80% of financial stocks were held by Malay individuals or corporations. Thus, low-interest loans were readily available for Malay interests. Wong, 1993, *op. cit.*
16. *Ibid.*
17. World Bank, *The East Asian Miracle*, Oxford University Press, Oxford, 1993.
18. M. Mahathir, 'Speech at the Seminar on Transnational Corporations and National Development', Petaling Jaya, 2 October 1979; 'Speech at the Third General Conference of the United Nations Industrial Development Organisation', New Delhi, 22 January 1980.
19. M. Mahathir, 'Speech at the Annual Dinner of Financial Institutions', Kuala Lumpur, 25 August 1986; 'Speech at the International Productivity Conference', Kuala Lumpur, 3 November 1986.
20. M. Mahathir, 'Speech at the Top Business Leaders' Conference on National Economic Development', Kuala Lumpur, 18 May 1984.
21. M. Mahathir, 'Speech at the Malaysian Investment Seminar', New York, 30 September 1986.
22. Mahathir, 1979, *op. cit.*
23. K. Machado, 'Japanese transnational corporations in Malaysia's state sponsored heavy industrialisation drive: the HICOM automobile and steel projects', *Pacific Affairs*, 62, 4, 1979, p. 507.
24. Vision 2020 is discussed in M. Mahathir, *Malaysia: The Way Forward*, Malaysian Business Council, Kuala Lumpur, 1991, p. 1; L. Wong, 'Celebrating the post', paper presented at *Text Representations in Asia*, Institute of Southeast Asia, Singapore, 1994, provides a critical evaluation of Vision 2020 and its underlying precepts.

25. M. Mahathir, *Mahathir Mohamad on the Multimedia Super Corridor*, Pelanduk Publications, Subang Jaya, 1998, p. 17.
26. Both these two programmes were centralising. The first programme was designed to consolidate all public R&D funding in one location, while the APITD put the direction of national technology in the hands of the Prime Minister.
27. This is ably discussed by Michael Hobday in his 'Understanding innovation in electronics in Malaysia', in K. S. Jomo and G. Felker (eds), *Industrial Technology Development in Malaysia: Industry and Firm Studies*, Routledge, London, 1999.
28. *Ibid*, p. 82.
29. G. Felker, 'Malaysia's innovation system: actors, interests, and governance', in Jomo and Felker (eds), *op. cit.*
30. P. A. David, *Technical Choice, Innovation and Economic Growth: Essays on American and British Experience in the Nineteenth Century*, Cambridge University Press, Cambridge, 1975.
31. Malaysia, *Sixth Malaysia Plan, 1991–1995*, Government of Malaysia, Kuala Lumpur, 1991.
32. Under the Plan, RM2.3 billion was allocated to government departments to effect their transition to the new IT environment and culture. The government, however, expects another RM25.4 billion to be invested in the same period. This is to come from private and foreign sources, but the 1997 Asian financial crisis and the 1998 Anwar fall-out have undermined this expectation.
33. See Alvin Toffler, 'Bad news for high-tech Malaysia', *Los Angeles Times*, 29 October 1998.
34. Clearly, the Malaysian government's attempt at social engineering is very much based on the notion that there is a linear correlation between structural development and performance. Many writers consider this mistaken and that organisational dysfunctions often arise from the 'import' of inappropriate structures. They also argue that, as significant as structures are, the processes underlying them—power, culture and various institutional influences—may indeed be more influential. See, for example, the following for a sample of these views: L. Smircich, 'Concepts of culture and organisational analysis', *Administrative Science Quarterly*, 28, 3, 1983, pp. 339–58; D. Knights and G. Morgan, 'Corporate strategy, organisations and subjectivity: a critique', *Organisation Studies*, 12, 2, 1991, pp. 251–73; J. Bessant, 'The lessons of failure—learning to manage new technology', *International Journal of Technology Management*, 8, 3, 1993, pp. 197–215; B. Czarniawska-Joerges, *The Three-dimensional Organisation: A Constructionist View*, Studentlitteratur, Lund, 1993; D. Leonard-Barton, *Wellsprings of Knowledge; Building and Sustaining the Sources of Innovation*, Harvard Business School Press, Boston, 1995; T. Clarke and S. Clegg, *Changing Paradigms: the Transformation of Management Knowledge for the 21st Century*, HarperCollins, London; W. Bennis, *Managing the Dream: Reflections on Leadership and Change*, Perseus Books, New York.
35. For a more in-depth discussion of technopoles, see M. Castells and P. Hall, *Technopoles of the World: The Making of Twenty-First Century Industrial Complexes*, Routledge, London, 1994.
36. Mahathir, 1998, *op. cit.*, pp. 38–40.
37. Multimedia Development Corporation, 1998, http://www.mdc.com.my.
38. I. Ariff and C.C. Goh, *Multimedia Supercorridor*, Leeds Publications, Kuala Lumpur, 1998.
39. Mahathir, 1998, *op. cit.*, pp. 42–3.
40. For details, see Ariff and Goh, *op. cit.*, pp. 116–7.
41. Mahathir, 1998, *op. cit.*, p. 30.
42. See Castells, *op. cit.*; J. Goddard and R. Richardson, 'Why geography will still matter: what jobs go where?', in W. H. Dutton (ed.), *Information and Communication Technologies: Visions and Realities*, Oxford University Press, Oxford, 1996; Massey *et al., op. cit.*
43. Putrajaya Corporation, *Putrajaya: The Federal Government Administrative Centre*, marketing brochure, 1997, p. 2; Multimedia Development Corporation (MDC), *Cyberjaya: The Model Intelligent City in the Making*, marketing brochure, 1997.
44. *Sunday Star*, 31 August 1997.
45. MDC, *7 Flagship Applications*, marketing brochure, 1996, p. 23.
46. MDC, *Investing in Malaysia's MSC: Policies, Incentives and Facilities*, marketing brochure, 1996, p. 12.

47. M. Mahathir, 'Speech at the opening of Multimedia Asia on the MSC', 1 August 1996.
48. MDC, *Building the Malaysian Multimedia Supercorridor and World Class Companies*, mimeo, p. 10.
49. M. Mahathir, 'Redeeming dignity of religion', speech at UMNO General Assembly, 5 September 1997 (http://www.smpke.jpm.my/speech-pm/1997/970905s.htm).
50. 'Dr M's high-tech folly', *Business Week*, 22 March 1999.
51. The notion of 'thick descriptions' draws on the anthropological work of Clifford Geertz. In *The Interpretation of Cultures*, Basic Books, New York, Geertz argues that most social analyses of Asia were superficial and failed to explain 'beyond things written on paper'. According to him, interpretation tends to quarantine culture as an explanatory variable. In so doing, interpretation becomes separated from process, from what people say, and what people do, and from what is done to them. In the case of Malaysia, most analysts have emphasised the export-oriented policies of the government as the prime reason for economic development in Malaysia. In so doing, they offer but a partial explanation. A thick description of the Malaysian economy, on the other hand, suggests that both the global dimension and the domestic apparatus of control, division and hegemony are critical elements. Via its domestic props, the Malaysian government has been able to domesticate its populace and meld them to fit into the global politico-economic matrix through its export-oriented industrial strategies. See L. Wong, 'Cultural claims on the new world order: Malaysia as a voice for the Third World?', in S. C. Yao (ed.), *House of Glass: Culture, Modernity and the State in Southeast Asia*, Institute of Southeast Asian Studies, Singapore.
52. Massey *et al., op. cit.*
53. P. Hall, *Governing the Economy: The Politics of State Intervention in Britain and France*, Oxford University Press, Oxford, 1986, p. 19.
54. This is discussed extensively by D. North, *Institutions, Institutional Change and Economic Performance*, Cambridge University Press, Cambridge, 1990, p. 3.
55. S. Lall, 'Technology policy and competitiveness in Malaysia', in Jomo and Felker (eds), *op. cit.*; INTAN, *Dasar-Dasar Pembangunan Malaysia*, Institut Tadbiran Awam Negara, Kuala Lumpur, 1994.
56. *Ibid*, p. 161.
57. The educational bureaucracy is highly fragmented. Three different ministries and the *Majlis Amanah Rakyat* (MARA) share authority for vocational education.
58. M. Kondo, 'Improving Malaysian industrial technology policies and institutions', in Jomo and Felker (eds), *op. cit.*
59. Lall, *op. cit.*
60. C. Edwards, 'Skilled and unskilled foreign labour in Malaysian development—strategic shift?', in Jomo and Felker (eds), *op. cit.*; Kondo, *op. cit.*
61. Lall, *op. cit.*; Kondo, *op. cit.*
62. *Business Week, op. cit.*
63. M. Mahathir, 'Remarks', in Ariff and Goh (eds), *op. cit.*
64. This is especially clear in the educational area. Here a racial quota for places at universities still persists despite an affirmative policy some 30 years old. Many Chinese with 10 distinctions (the highest possible grades) have had their applications rejected at local universities over the years. Malays have never been required to meet such exacting standards.